## BOARD OF SELECTMEN Edward H. Dlott Meeting Room AGENDA August 20, 2018 6:00 PM

Open Session Begins at 7:15 PM

## EXECUTIVE SESSION

**Real Property** 

a. Mechanic Street

b. 5 Auburn Street (Riverbend School)

c. 22 Pleasant Street

Litigation: Navy Yard

### **ANNOUNCEMENTS**

- 1. Pat Conaway, Natick Earth Day Planning Group/Keep Natick Beautiful: Updates
- 2. Eileen Collett, Ellen Lasri, SOAR Natick: Opioid Epidemic Public Awareness Flag Display
- 3. Susan Ramsey, Director, Council on Aging: Grant Awards

a. Massachusetts Councils on Aging Grant for 50+ Job Seekers Regional Networking Group
b. BayPath Elder Services Grant for Outreach & Host Programs for LGBT Community
c. MetroWest Health Foundation Grant for the Natick Conversation Project

### RESPONSES TO CITIZENS' CONCERNS

- 4. Composition of Zoning Board of Appeals
- 5. 22 Pleasant Street
- 6. Little Jennings Pond
- 7. East Park & Navy Yard

### CITIZENS' CONCERNS

### **REQUESTED ACTION**

- 8. Approve One-Day Liquor License Application: The Joey Fund/Cystic Fibrosis Foundation
- 9. Procurement Officer: Discuss/Approve Contracts and Related Internal Borrowing
  - a. East Park Reconstruction Contract

b. Navy Yard Reconstruction Contract

- 10. Police Chief: Approve Appointment of Two Reserve Police Officers
- Sustainability Coordinator: Green Communities Grant -Approve and Sign Seven Contracts

   a. LED lighting: Eliot School & DPW (3)

b. VFD (variable free drives) on rooftop units: Police & Fire Departments (2)

c. VFD on chilled water pump: Morse Institute Library (1)

d. Ductless mini-split: Morse Institute Library (1)

### <u>APPOINTMENTS</u>

12. David Pratt: Interview for Appointment to the Economic Development Committee

### **DISCUSSION AND DECISION**

- 13. Sign October 16, 2018 Fall Town Meeting Warrant
- 14. Announce 2018 Special Town Meeting #2: Tuesday, October 2, 2018, 7:30 P.M.
- 15. Schedule Presentation of Resolution Honoring Lynda Simkins, Former Executive Director of the Natick Community Organic Farm
- 16. West Natick Fire Station: Vote to Support Town Administrator's Funding/Financing Recommendation

### COMMITTEE/PROJECT UPDATES

### CONSENT AGENDA

- Approve Request for Exemption from Town Bylaws Chapter 41, Section 4: Irene Carrick - Media Paraprofessional, Schools/ASAP Substitute Instructor, Schools
- 18. Approve Town Common Request: 2019 Natick Earth Day Festival 4/28/19 (RD: 5/5/19)
- 19. Approve United Way of Tri-County 5K Run/Walk 10/13/18
- 20. Approve Town Clerk's Request to Bag Meters for Free Voter Parking on Election Day, 9/4/18
- 21. Confirm the Town Administrator's Reappointment of George Richards to the Golf Course Oversight Committee
- 22. Reappoint Doug Landry to the Economic Development Committee
- 23. Accept Resignation of Daiva Izbickas Verselis from the Zoning Board of Appeals
- 24. Weekly Warrant Review 8/2/18

# SELECTMEN SUBCOMMITTEE/LIAISON UPDATES

TOWN ADMINISTRATOR NOTES

SELECTMEN'S CONCERNS

CORRESPONDENCE

Correspondence 8/20/18

Next Meeting Dates.....Thursday, 9/6.....Monday, 9/17

# ITEM TITLE: Pat Conaway, Natick Earth Day Planning Group/Keep Natick Beautiful: Updates

# ITEM SUMMARY:

ATTACHMENTS:		
Description	Upload Date	Туре
Volunteers Needed for Natick Earth Day (4/28/19)	7/31/2018	Cover Memo
Natick Earth Day & Keep Natick Beautiful Update	8/14/2018	Cover Memo

# NATICK EARTH DAY – APRIL 29, 2019

Volunteers are needed to help plan the ninth consecutive Natick Earth Day Festival scheduled for April 29, 2019. If interested, please contact Pat Conaway at <a href="mailto:bpconaway@gmail.com">bpconaway@gmail.com</a>.

**Patrick Conaway** <br/> <br/> <br/> <br/> bpconaway@gmail.com> Mon, Aug 13, 2018 at 6:12 PM To: amistrot@natickma.org<br/> cc: jfreedman@natickma.org, poneil@natickma.org, ddonovan@natickma.org

# Natick Earth Day:

• Thanks to Jillian, we now have a coordinator for the *2019 Earth Day Festival* (Our 9<sup>th</sup> in succession), tentatively scheduled for Sun. 4/28/19, Natick Common, 11 - 3 pm (Rain Date: 5/5/19)

• A new Planning Committee is in progress. Our first Meeting is Mon., 8/13. Others will be posted.

• Support and coordination with the BOS, Parks and Rec, and DPW has been terrific in recent years. Will be needed again.

• We still need many more volunteers.

# Keep Natick Beautiful:

• Brief update on our Adopt a Spot and Trail Buddy Programs

• We're still working hard to make Natick the "*First One of the 351*" Massachusetts cities and towns to go "trash free."

• We've recruited more than 200 volunteers all over Natick who regularly "pick up" in their neighborhoods, or nearby parks, trails, roadways, etc.

• We have *60 KNB units* all over Town from which we collect about 400 lbs. of trash and 150 lbs. of recyclables every week.

• I supply them with tools - equipment - supplies (pickers, bags, gloves, and reflector vests). Some of them contact me to say they have a couple of bags. I swing by and pick them up with my truck and trailer.

• *Tom Hladick and the DPW* allow me to use the Cole Center Dumpster and Single Stream Recycle Toters for our "collections."

• Challenging areas still persist. We have about 25 "*Litter Hot Spots*." But we're making progress everywhere.

• As of 6/13/18 we became one of the 4 Massachusetts Cities and Towns to be an official *Affiliate of Keep America Beautiful*.

• In 2017 we received a generous grant (\$5000) from KAB for our work with the *Natick Trails and Trash.* 

# ITEM TITLE: Eileen Collett, Ellen Lasri, SOAR Natick: Opioid Epidemic Public Awareness Flag Display

# **ITEM SUMMARY:**

# ATTACHMENTS: Description Announcement Sample Display

**Upload Date** 8/14/2018 8/14/2018

**Type** Cover Memo Cover Memo



# **BOS Agenda item**

1 message

**Eileen Collett** <ecollett34@comcast.net> Reply-To: Eileen Collett <ecollett34@comcast.net> To: poneil@natickma.org Cc: Ellen <ellen\_lasri@yahoo.com> Fri, Aug 10, 2018 at 12:35 PM

SOAR Natick, The Journey, and The Natick Opioid Task Force are planning a flag display to increase public awareness of the effects of the opioid epidemic on Massachusetts and Natick residents.

Eileen Collett - SOAR Natick

Ellen Lasri, SOAR Natick





**IMG\_1936.JPG** 2898K

ITEM TITLE:	Susan Ramsey, Director, Council on Aging: Grant Awards
ITEM SUMMARY:	a. Massachusetts Councils on Aging Grant for 50+ Job Seekers Regional Networking Group
	b. BayPath Elder Services Grant for Outreach & Host Programs for LGBT Community
	c. MetroWest Health Foundation Grant for the Natick Conversation Project

# ATTACHMENTS:

Description	Upload Date	Туре
MA Councils on Aging & BayPath Elder Services Grants	8/14/2018	Cover Memo
MetroWest Health Foundation Grant	8/14/2018	Cover Memo

August 2, 2018

TO: Donna Donovan

FR: Susan Ramsey

RE: Request to the Board of Selectmen to Accept Two Grants

The Council on Aging received notice of award for the following grants. Both grants are cost reimbursement and as such I recommend that income be directed to account #20094-432075.

1. Award from Massachusetts Councils on Aging in the amount of \$700.00 to host a 50+ Job Seekers Regional Networking Group during FY 2019. The program addresses the needs of the "Mature Worker, which is defined as anyone age 50 and older. The program, entering its second year in Natick, is marketed to the mature job seeker demographic, whether unemployed, underemployed, unhappily employed, returning to the workforce after a lengthy gap or retired and looking for an encore career. 60 individuals benefitted from the service in FY 2018

2. Award from BayPath Elder Services in the amount of 17,849.34. The grant is in collaboration with Councils on Aging in Framingham, Northborough, Marlborough and Hudson to provide outreach and host programs for the LGBT community and allies. Each center will host a mini-series (3 - 4 wks) focusing on a specific topic, followed by monthly events rotating among the 5 communities. The program is building on the success of the Natick COA's work in the LGBT community in FY2018.



# Fwd: Another Grant Award request for the Selectmen to Approve

1 message

**Donna Donovan** <ddonovan@natickma.org> To: Patricia O'Neil <poneil@natickma.org> Tue, Aug 7, 2018 at 10:19 AM

Donna Donovan Senior Executive Assistant Town of Natick 508-647-6410

------ Forwarded message ------From: **Ramsey Susan** <sramsey@natickma.org> Date: Tue, Aug 7, 2018 at 9:39 AM Subject: Another Grant Award request for the Selectmen to Approve To: Donna Donovan <ddonovan@natickma.org>

Hi Donna,

Is it possible to add another request to accept a grant award for the COA on the meeting agenda for the Selectmen's meeting on the 20th?

I received notice yesterday from the MetroWest Health Foundation of a grant award of \$99,000.00 to launch a collaborative program with the foundation to engage the Natick community in conversations around end of life wishes and encourage the completion of health care proxies. The project is called the The Natick Conversation Project and aims to create a culture in Natick where conversations about end of life wishes with loved ones and others are commonplace. This will be accomplished through raising awareness of the importance of having conversations at all stages of life, providing tools, resources and supports to help guide conversations, and create safe places where residents can learn about and discuss freely end of life issues. The program will work closely with The Conversation Project and utilize their model and materials. www.theconversationproject.org

Thanks. Susan

--

Susan Ramsey, Director Council on Aging 117 East Central Street Natick, MA 01760

o: 508-647-6540 c: 774-270-3134 f: 508-647-6548 e: sramsey@natickma.org

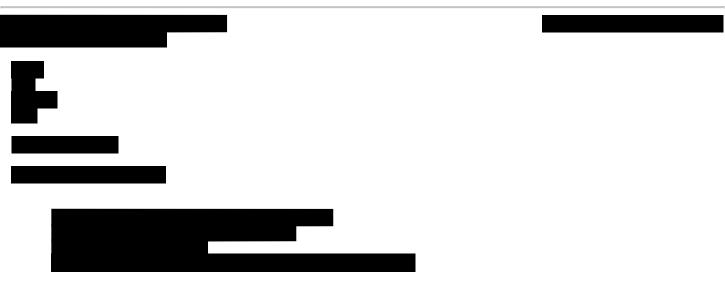
# ATTACHMENTS:

**Description** Email from Resident-J. Wadsworth **Upload Date** 8/20/2018

**Type** Cover Memo

# Fwd: Massachusetts remediations/Pleasant Street

6 messages



From: "Wadsworth, John W." <JWadsworth@brownrudnick.com> Date: August 18, 2018 at 10:50:30 AM EDT To: "Michael J. Hickey Jr." <mhickey@natickma.org> Subject: Massachusetts remediations/Pleasant Street

I heard that you are going to be discussing the possible purchase of the Pleasant street property and that one of the concerns is with the clean up of the contamination on the site. I have been an environmental attorney for over 30 years. I have spoken to several of the selectmen about general clean up and liability and health risk issues in connection with this parcel, with the rail trail, and with JJ Lane park. For the latter two, my thoughts were that the environmental concerns being raised probably overstated the actual risks, and were being raised mainly to unduly raise people's concerns in order to try to stop the project.

With Pleasant Street, my concern has mainly been with the level of risk that the town could still face if it agrees to purchase the property on the condition that it is cleaned up by the seller.

I am supposedly retired, but I have had to actively start working again on a project that was completely remediated and issued closure documents over ten years ago. The site I am still working on is a condominium development in Hingham. Our buyer purchased it on the condition that the seller fully remediate the land and file all closure reports, which they did. Several years after my client owned the property, DEP audited the work done, and rejected the clean up reports and required my client to conduct additional testing and soil removal and to refine closure reports. We did that, but several years later, in 2015, DEP again audited the work, and found problems and required several hundred thousand dollars of additional work to satisfy their concerns. Then a month ago, they issued another audit of the site, and raised additional concerns that will require the client to spend another slug of money to respond to.

As background, the Departement of Environmental Protection requires remediation of contaminated sites. But the remediation is designed and carried out by private consultants. DEP by regulation cannot tell a consultant what to do or advise them that a remediation is acceptable, because that would open them up to liability if they are wrong or have incomplete data, and would gum up the process because every consultant would want DEP's stamp of approval before the work is done. DEP will not do that. What DEP can do is to audit the work after it is done and reject the closure or require new testing, etc. Generally those audits have to occur between 2 and 5 years after the site is "closed". (This is why my client keeps getting audited and has to redo the work- DEP doesn't look at what was done until years after the work is finished)

The Pleasant street site has some serious industrial contamination. It cannot be remediated until after the building is demolished and we can't even know the level of clean up that will be required until the building is gone. (A new industrial use could probably go in the building under DEP rules, but not a park.)

My understanding is that the seller will clean up the site and file a clean closure report as a condition of closing. However, that is the same position that my client was in in Hingham. The seller will do the work as cheaply as possible. While the clean up consultants have professional and DEP standards that they must adhere to, there are many judgment calls involving what will ultimately be deemed acceptable to DEP that have to be made over the course of the remediation, and DEP can ultimately disagree with what was done.

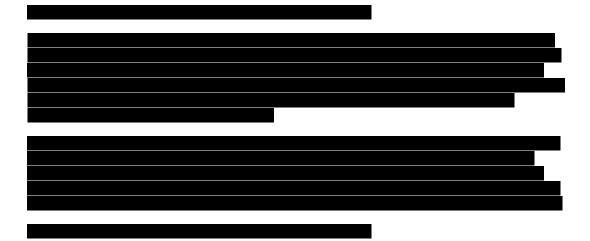
At that point the town will be the owner and responsible for redoing the work. The town may have a claim against the prior owner, but you will always lose money trying to chase the prior owner even if they give a full indemnity, and when DEP finally raises issues, the prior owner may well be judgement proof.

The site I am working on that keeps coming back involves no remaining risk to the public. It was initially completely remediated and a final closure filed with the DEP 10 years ago. The new work DEP has required over the past 10 years has essentially proven that the initial clean up was successful. But it has cost my client hundreds of thousands of dollars to prove that to DEP's satisfaction. Perhaps if the Pleasant Street building is demolished and a full evaluation can be conducted in order to figure out the potential liability, the town might be able to protect itself. But relying on the fact that the seller agrees to not close until the town is satisfied with the remediation and closure filing is a mistake, since that will be subject to audit and second guessing by DEP for years.

I am happy to discuss this with any of the selectmen.

John Wadsworth

Sent from my iPad



# ITEM TITLE: Little Jennings Pond ITEM SUMMARY:

# ATTACHMENTS:

**Description** Little Jennings Pond Clean-Up **Upload Date** 8/16/2018

**Type** Cover Memo



PLANNING

ZONING

CONSERVATION



# COMMUNITY AND ECONOMIC DEVELOPMENT

7/23/2018 RE: Little Jennings Pond Cleanup

Dear Resident,

My name is Victoria Parsons, I am the Conservation Agent and Planner for the Town of Natick. I work with the Natick Conservation Commission to help protect Natick's natural resources. The Town Forest Committee recently met with the Conservation Commission to discuss maintenance needs within the Town Forest. Some of those needs are invasive species control, keeping the trails open and free from hazards, and some selective tree trimming and brush clean up. The Conservation Commission is the environmental permit issuing authority if any type of work is conducted within 100 feet of ponds, intermittent streams and wetlands. The Town Forest Committee also brought up some concerns within Little Jennings Pond. The Town Forest Committee would like to pull some downed trees out of Little Jennings Pond. The Town is not taking ownership of Little Jennings Pond. Recognizing that Little Jennings Pond ownership boundaries have not changed, the Town Forest Committee obtained a permit to perform the maintenance activities they requested from the Conservation Commission. This letter serves to ask permission to pull some of the downed trees and branches out of Little Jennings Pond. This is an effort to help the overall ecosystem the branches are affecting the flow in Little Jennings pond and the stream at the western edge of the forest.

The work would be performed by a professional tree service contractor and the work complete hopefully by fall. The requirement through the permit is to disturb as little sediment and surrounding vegetation as possible. They will be charged with not leaving debris behind as well.

I also wanted to take this opportunity to briefly discuss fertilizer use. The number of plants and algae in water bodies like Little Jennings Pond will increase when there is an increased supply of nutrients such as phosphorus and nitrogen. Many fertilizers (including manure) contain an excess supply of these nutrients. These nutrients enter water bodies and can cause algal blooms. Algal blooms die off quickly and as they decompose this removes oxygen from the water. Decreased oxygen from the water negatively impacts aquatic organisms and all pond life. We strive to spread the word to every Natick resident to please be mindful of lawn and plant treatment on your properties.

If you have any concerns or questions about this upcoming cleanup efforts please contact me by August 6 to discuss. My contact is <u>vparsons@natickma.org</u> or 508-647-6452.

Sincerely

Victoria Parsons Conservation Agent/Planner Community and Economic Development Town of Natick

PARCEL ID	STREET NO	STREET NAME	OWNER OF RECORD	MAILING ADDRESS	CITY
21-00000173	44	CONNECTICUT AVE	PERRY ADAM	44 CONNECTICUT AVE	NATICK
21-00000174	38	CONNECTICUT AVE	SULLIVAN MICHAEL	38 CONNECTICUT AVE	NATICK
21-00000175	36	CONNECTICUT AVE	BARBIERI JOHN	<b>26 CONNECTICUT AVE</b>	NATICK
21-00000176	30	CONNECTICUT AVE	AUCOIN DEBRA A	<b>30 CONNECTICUT AVE</b>	NATICK
21-00000177	28	CONNECTICUT AVE	BARBIERI JOHN L	26 CONNECTICUT AVE	NATICK
21-00000178	26	CONNECTICUT AVE	BARBIERI JOHN L	<b>26 CONNECTICUT AVE</b>	NATICK
21-00000183	18	CONNECTICUT AVE	CAREY IRREVOCABLE TRUST	<b>18 CONNECTICUT AVE</b>	NATICK
21-00000184	14	CONNECTICUT AVE	PARE MATTHEW	<b>14 CONNETICUT AVE</b>	NATICK
21-00000185	8	CONNECTICUT AVE	TAN HUICHAO	<b>8 CONNECTICUT AVE</b>	NATICK
21-00000186	6	CONNECTICUT AVE	TAN HUICHAO	8 CONNECTICUT AVE	NATICK
21-00000187	4	CONNECTICUT AVE	HALL KRISTIN B	<b>4 CONNIECTICUT AVE</b>	NATICK

Doug Shepard asked to outline what is being proposed to clear. It's ConCom land. Over an acre, then the 100 ft. buffer. We want a successful meadow, not just cleared trees. Would like to reduce the regrowth of trees now.

Mr. Mike Downey stated there is a lot of grant money available. A tree company is needed. The town uses New England Tree Service and we have a contract rate with DPW as an option or other tree companies can be used.

#### <u>Request for Determination – 440 Worcester Street – Town Forest</u>

Doug Shepard read public hearing notice. The proposal is to perform trail maintenance, fill pot holes, clear debris. Looking for a maintenance plan to fix problems when they arise.

There are large tree limbs that need to be removed or are close to falling on the trail. Little Jennings Ponds is silting up, cluttered with tires, carpet, etc in pond effecting wildlife. The trees in water can be removed by DPW.

Doug Shepard asked if forest committee is looking to hire someone. Yes. The pot holes they can fill. A tree company is needed. Ms. Parsons stated DPW has a contract with New England Tree Service. Kathy Rehl stated Ralph is a very good tree specialist, as well as Greymont – all reputable.

Mr. Shepard asked for a motion to close, Jeff Richards moved, Kathy Rehl seconded, all in favor 6-0.

Mr. Shepard asked for a motion to issue a Negative 3 Determination, Kathy Rehl moved, Jeff Richards seconded, all in favor 6-0.

#### <u>Request for Determination – 19 Superior Drive</u>

Doug Shepard read public hearing notice. The proposal is to construct an approximately 500-ft long, 10-ft wide bituminous concrete path and associated retaining walls to connect the redeveloped Mathworks campus with the future Cochituate rail trail.

Justin Dufresne, VHB, representing Mathworks, described project. He had been before the Commission to introduce the project before filing. A few concrete walls along path are 3-5 ft high.

Commission has no issues with project.

Conservation Commission Minutes April 19, 2018 ITEM TITLE: East Park & Navy Yard ITEM SUMMARY:

# **ITEM TITLE:** Approve One-Day Liquor License Application: The Joey Fund/Cystic Fibrosis Foundation

### **ITEM SUMMARY:**

# ATTACHMENTS:

Description	Des	cription	
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Application Request Bar Map Police Approval with Stipulations

# Upload Date

8/14/2018

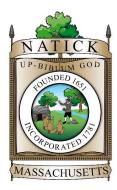
8/14/2018

8/14/2018

8/15/2018

Туре

Cover Memo Cover Memo Cover Memo



Office Use Only:		
Date Pmt Rec'd: Fee F	Paid: \$	_ Check No:
Police Department approval issued	d 🗆 Notes:	
Board of Health approval issued		
Board of Selectmen Decision Date		
	Approved	Denied

Fee: \$50.00

# **TOWN OF NATICK**

### **ONE-DAY LIQUOR LICENSE APPLICATION (SECTION 14 LICENSE)**

(Type or print clearly; illegible applications will not be accepted)

A <u>nonprofit</u>\* organization may apply for either a one-day all-alcohol license or one-day beer and/or wine license. A <u>for profit</u>\*\* organization may apply for a one-day beer and/or wine license <u>ONLY</u>. Special license-holders CANNOT purchase alcoholic beverages from a package store
 ; alcoholic beverages must be purchased from a State licensed supplier:

https://www.mass.gov/service-details/apply-for-a-special-license-or-permit-abcc.

Date Submitted: \_\_\_\_\_

The undersigned hereby applies for a One-Day Liquor License in accordance with the provisions of the Statutes relating thereto:

### **Applicant Information:**

Name		
		Email address
Type of Organization:		Nonprofit*   For profit**
Type of alcohol to be served:		All alcohol (nonprofit organizations only)
		Beer and/or Wine (any organization)
Event Details:		
Type of event		
Location where event will be held	<u>ـ</u> ا	
Date of event		Hours of event
Estimated attendance		

Alcohol Service Details:		
Caterering/Serving Company		
Address		
	Email address	
Please add any additional information you	ı think may be pertinent:	
Please add any additional information you	ı think may be pertinent:	

Please print and submit completed application to the Board of Selectmen's Office (508-647-6410), Natick Town Hall, 13 East Central Street, Natick, MA 01760, or email to <u>poneil@natickma.org</u> or <u>ddonovan@natickma.org</u>. See additional important licensing information on the Town website at natickma.gov: click on Government, then on Board of Selectmen, then on Grants, Licenses & Permits. Contact the Board of Health (508-647-6460), located on the second floor of Town Hall, regarding any other permits you may need or requirements you should be aware of pertaining to your application for a one-day alcohol license.

**PLEASE NOTE:** If your application is approved, the Town of Natick will require:

- 1. Proof of current alcohol server training through either the TIPS or the AIM <u>in-person</u> training programs. <u>Online server training certification, such as eTIPS, will NOT be</u> <u>accepted by the Town of Natick</u>.
- 2. A certificate of liability insurance naming the Town of Natick as an additional insured.



July 19, 2018

Dear Board of Selectman,

The *Thirty Fourth Annual Joey O'Donnell Film Premiere* to benefit The Joey Fund/Cystic Fibrosis Foundation is underway! This year's event is scheduled for Sunday, October 28, 2018 at the Natick Mall in Natick. I am writing to request your approval of a temporary, 1 day liquor license for the event.

The event will start at 6:30 p.m. with an exclusive reception of regional cuisine from local restaurants on the first level of the mall in the Neiman Marcus court for 800-1,000 invited guests. At 8:30 p.m. guests will then be transported via limousine to the AMC Theatres-Framingham for their private premiere. Our expected guests include the worlds of business, politics, sports and media. In 2017 the Film Premiere raised over \$900,000 for cystic fibrosis research.

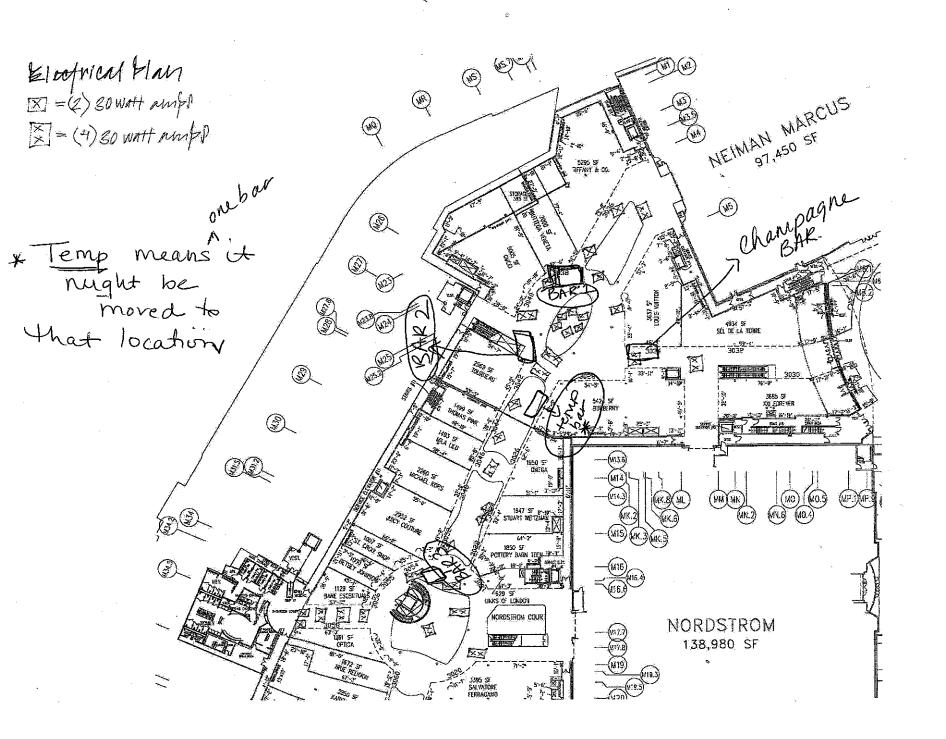
The Joey Fund / Cystic Fibrosis Foundation was established in 1955 and exists to ensure that a cure for cystic fibrosis (CF) will be found. In 1986, friends and associates of Joe O'Donnell started The Joey Fund when his son Joey passed away after a courageous battle with CF.

Joe & Kathy O'Donnell have been hosts of the premiere since the inception of the event; friends of Kathy and Joe O'Donnell have contributed generously to the Film Premiere raising over \$75 million over the past 30 years.

As part of the of the Joey O'Donnell Film Premiere, Joe O'Donnell and I, along with the film premiere committee are respectfully requesting your support by allowing us permission to serve alcohol through our caterer, Off the Vine. Off the Vine uses only licensed bartenders, who are anticipated to serve the guests of the event at the reception from 6:00 pm to 9:00 pm. Our plan is to have three full service bars and a champagne station (which are marked on the attached map) on the first level of the mall. All of the beer, wine, champagne and liquor that is served that evening is donated. The event will be cordoned off and guarded - the general public will not be allowed in the area and our guests will be all identified with a Film Premiere sticker which will be given to them when they check in at registration.

If you have any other further questions please call us at the Cystic Fibrosis Foundation at 1-800-966-0444. Thank you in advance for your consideration.

Sincerely, Pam Spitzer, Executive Director Tracy Lund, Senior Director of Development





Donna Donovan <ddonovan@natickma.org>

# Re: Joey Fund/CF - Film Premiere event at the Natick Mall - Oct 28th

1 message

Brian Lauzon <lauzon@natickpolice.com> To: Donna Donovan <ddonovan@natickma.org> Thu, Jul 26, 2018 at 12:23 PM

Donna,

We would recommend that the BOS, as the Licensing Authority, approve this request as we have actively participated with the organization of this event since it was moved here from Newton quite a few years ago and we are very familiar and comfortable with what is proposed again this year. Our only requests are that (4) four police details be hired, one for each of the "full bar" set ups and one in civilian clothes acting as the liquor control/enforcement officer, and that all servers of alcoholic beverages be in compliance with the Town's policy regarding "in-person" alcoholic beverage service training. As always, if this request is approved by the BOS and the applicant has any questions or needs further coordination they can reach out to me directly.

Respectfully,

Lt. Brian G. Lauzon

On Thu, Jul 26, 2018 at 9:43 AM, Donna Donovan <ddonovan@natickma.org> wrote: | Hi Brian,

It's the annual Joey O'Donnell film premiere.

Thank you.

Donna Donovan Senior Executive Assistant Town of Natick 508-647-6410

----- Forwarded message ------From: Lund, Tracy <tlund@cff.org> Date: Wed, Jul 25, 2018 at 5:59 PM Subject: Joey Fund/CF - Film Premiere event at the Natick Mall - Oct 28th To: Donna Donovan <ddonovan@natickma.org>

Hi Donna,

Great speaking with you last week about the one day liquor license for the 34<sup>th</sup> Annual Joey O'Donnell Film Premiere. Attached is the letter, the map (might change so slightly) and the application from online. I can bring the check to the meeting on the 20<sup>th</sup> unless I need to bring it earlier. Please let me know.

Look forward to seeing you at the meeting on August 20<sup>th</sup>.

Thanks,

Tracy Lund

Sr. Dírector of Development

Cystic Fibrosis Foundation

# 220 North Main Street, Suite 104

# Natick, MA 01760

Phone: 508-655-6000

Fax: 508-652-6942

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# ITEM TITLE: Procurement Officer: Discuss/Approve Contracts and Related Internal Borrowing

ITEM SUMMARY: a. East Park Reconstruction Contract b. Navy Yard Reconstruction Contract

# ATTACHMENTS:

Description	Upload Date	Туре
East Park-Recommendation for Award of Contract & Contract-B. LeBlanc	8/16/2018	Cover Memo
East Park-Addendum 1	8/16/2018	Cover Memo
East Park-Alternates	8/16/2018	Cover Memo
East Park-Appendix C	8/16/2018	Cover Memo
East Park Drawings #1	8/16/2018	Cover Memo
East Park Drawings #2	8/16/2018	Cover Memo
East Park Drawings #3	8/16/2018	Cover Memo
East Park Project Manual	8/16/2018	Cover Memo
Internal Borrowing-East Park	8/17/2018	Cover Memo
Internal Borrowing-Navy Yard	8/17/2018	Cover Memo

# TOWN OF NATICK MASSACHUSETTS



TO: Natick Board of Selectmen Melissa A. Malone, Town Administrator William D. Chenard, Deputy Town Administrator, Operations Jemma Lambert, Director of Community Services Karen Partanen, Director of Natick Recreation and Parks

FROM: Bryan R. Le Blanc, Procurement Officer

**DATE:** August 15, 2018

### SUBJECT: CONTRACT AWARD EAST PARK RECONSTRUCTION

On July 26, 2018, bids were received for East Park Reconstruction in the Town of Natick. This procurement is for horizontal or public works construction, which is governed by M.G.L. c. 30, §39M. Bids were received from six (6) bidders. (See attached.)

The lowest bidder, M.J. Cataldo, Inc., is the lowest responsible and eligible bidder. We recommend that the Natick Board of Selectmen award the contract to M.J. Cataldo, Inc. for the main bid work. The amount of the award will be for \$2,300,000.00. Together with Weston & Sampson, Inc., we reviewed the bids received and have checked the references and qualifications of M.J. Cataldo, Inc.

This is a fixed price contract, and any change orders would require approval by the Town. Periodic payments shall be made for satisfactory performance of the work pursuant to M.G.L. c. 30, §39G. The work is scheduled to be substantially complete by July 15, 2019.

Please advise if you have any questions or require additional information.

Bids Received:	7/26/18
Newspaper Advertisement:	7/11/18
Website Posting:	7/02/18
Town Hall Posting:	7/02/18
Central Register:	7/11/18
COMMBUYS Posting:	7/02/18

Funding: Article 10, Item 3, Fall 2017 Town Meeting - Tax Levy Borrowing (\$2,535,000)

Bids Received: See attached.

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		and Parks		Total Bid Price	well dulle former	\$2,300,000 Add 1 - \$22,500; Add 2 - \$10,000; Add 3 - \$14,500	\$2,623,000 Add 1 - \$42,000; Add 2 - \$88,000; Add 3 - \$59,000	\$2,669,600 Add 1 - \$39,800; Add 2 - \$88,200; Add 3 \$92,800	\$2,800,000 A dd 1 - \$27,500; Add 2 - \$83,000; Add 3 \$24,500	\$3,021,800 Add 1 - \$33,000; Add 2 - \$113,000; Add 3 - \$75,000	\$3,115,000 Add 1 - \$29,000; Add 2 - \$108,000; Add 3 - \$48,000				1-1×	(d) 12		
		Dept: Recreation and Parks		Certificate of Non-Debarment		x	×	×	×	×	×			6	17		Ø	
		Dept:		Compliance with MGL 151B		×	×	×	×	×	×				R		Q Q	
				Certificate of Insurability		×	×	×	×	×	×		 	Y Y	K	Leer L	Ϋ́ γ	
				Signature of Bidder & Addenda Receipt 1		×	×	×	×	×	×				and a			
Vatick	g Form			e Conflict of Interest Certificate		×	×	×	×	×	×						Ď	
Town of Natick	IFB Opening Form			Cert. of Corporate Bidder		×	×	×	×	×	×				Je kel	K K	d F	
				Tax Compliance Certification	-	×	×	×	×	×	×				Lutus S		I CKK	
				Certificate of Non-Collusion		×	×	×	×	×	×				- see		S I	
				Bid Security (Bond)		×	×	×	×	×	×				Ψ)	CPO Signature:	Witness Signature:	
		UCTION	A.M. EDST	Envelope Sealed & Marked		×	×	×	×	×	×			-		-	ΨĤ	
		BIDS - EAST PARK RECONSTRUCTION	Date & Time: July 26, 2018, 11:00 A.M. EDST			Company reams M.J. Cataldo, Littleton, MA	Ronald Marini, Newton, MA	MacKay, Wilmington, MA	Quirk, Georgetown, MA	Mountain View, Chicopee, MA	NELM, Rockland, MA							

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### **AGREEMENT**

THIS AGREEMENT made this twentieth day of August in the year 2018, by and between the Town of Natick, Massachusetts, Natick Town Hall, 13 East Central Street, Natick, MA 01760 (hereinafter called OWNER), by its Board of Selectmen, and M.J. Cataldo, Inc., having an address of 41 Robinson Road, Littleton, MA 01460, and a principal place of business at 563 King Street, Littleton, MA 01460, and doing business as a corporation organized under the laws of the Commonwealth of Massachusetts, hereinafter called "CONTRACTOR."

WITNESSETH: That for and in consideration of the payments and agreements hereinafter mentioned, OWNER and CONTRACTOR hereby agree as follows:

## ARTICLE 1. WORK

1.1. CONTRACTOR shall commence the Work as specified or indicated in the AGREEMENT Documents as defined in Article 8 herein. The Work is generally described as follows:

1.2. The Work for this project consists of parks construction for the East Park in Natick.

1.3. CONTRACTOR shall furnish all materials, supplies, tools, equipment, labor, and other services necessary for the construction and completion of the Project described herein.

### ARTICLE 2. ENGINEER

2.1. The Project has been designed by Weston & Sampson, Inc., which is hereinafter called ENGINEER and who shall act as OWNER'S representative, who shall assume all duties and responsibilities, and who and shall have the rights and authority assigned to ENGINEER in the AGREEMENT Documents in connection with completion of the Work in accordance with the AGREEMENT Documents.

## ARTICLE 3. AGREEMENT TIME

3.1. CONTRACTOR shall commence work when authorization by the OWNER or ENGINEER with the provisions of the Notice to Proceed and AGREEMENT Documents. The work will be substantially complete by July 15, 2019.

### ARTICLE 4. AGREEMENT PRICE

4.1. In consideration for performance of the work as required by the AGREEMENT Documents, the OWNER shall pay CONTRACTOR for completion of the Work in accordance with the AGREEMENT Documents in current funds as follows:

Contractor's Bid is attached to this AGREEMENT as an exhibit.

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### AGREEMENT PRICES

### ITEM UNIT NO. DESCRIPTION QUANTITY PRICE

- 1. For the total lump sum price of two million two hundred sixty-five thousand dollars and zero (\$2,265,000.00)
- 2. For well drilling and all equipment, the allowance price of thirty-five thousand dollars and zero cents (\$35,000.00)

## TOTAL AGREEMENT AMOUNT \$2,300,000.00

As permitted by law, specific items of this AGREEMENT may be eliminated, or reduced in quantity to keep within the limits of available funding, at the OWNER'S option.

### ARTICLE 5. PAYMENT PROCEDURES

5.1. CONTRACTOR shall submit Applications for Payment in accordance with Article 14 of the General Conditions, as modified, if applicable, by the Supplementary Conditions. Applications for Payment will be processed by ENGINEER as provided in the General Conditions.

5.2. Progress Payments. OWNER shall make progress payments on account of the AGREEMENT Price on the basis of CONTRACTOR'S Applications for Payment as recommended by ENGINEER and as provided in Article 14 of the General Conditions, as modified, if applicable, by the Supplementary Conditions.

5.3. Final Payment. Upon final completion and acceptance of the Work in accordance with paragraph 14.13 of the General Conditions, as modified, if applicable, by the Supplementary Conditions, OWNER shall pay the remainder of the AGREEMENT Price as recommended by ENGINEER as provided in said paragraph 14.13.

### ARTICLE 6. TERMS

6.1. Terms used in this Agreement, which are defined in Article 1 of the General Conditions, as modified, if applicable, by the Supplementary Conditions, will have the meanings indicated in the General Conditions, as modified, if applicable, by the Supplementary Conditions.

### ARTICLE 7. CONTRACTOR'S REPRESENTATIONS

In order to induce OWNER to enter into this AGREEMENT CONTRACTOR makes the following representations:

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7.1. CONTRACTOR has familiarized itself with the nature and extent of the AGREEMENT Documents, work, site, locality, and all local conditions and Laws and Regulations that in any manner may affect cost, progress, performance or furnishing of the Work.

7.2. CONTRACTOR has studied carefully all reports of explorations and tests of subsurface conditions and drawings of physical conditions which are identified in the Supplementary Conditions as provided in paragraph 4.2 of the General Conditions, and accepts the determination set forth in paragraph SC-4.2 of the Supplementary Conditions of the extent of the technical data contained in such reports and drawings upon which CONTRACTOR is entitled to rely.

7.3. CONTRACTOR has obtained and carefully studied (or assumes responsibility for obtaining and carefully studying) all such examinations, investigations, explorations, tests, reports and studies (in addition to or to supplement those referred to in paragraph 7.2 above) which pertain to the subsurface or physical conditions at or contiguous to the site or otherwise may affect the cost, progress, performance or furnishing of the Work as CONTRACTOR considers necessary for the performance or furnishing of the AGREEMENT Price, within the AGREEMENT Time and in accordance with the other terms and conditions of the AGREEMENT Documents, including specifically the provisions of paragraph 4.2 of the General Conditions, as modified, if applicable, by the Supplementary Conditions; and no additional examinations, investigations, explorations, tests, reports, studies or similar information or data are or will be required by CONTRACTOR for such purposes.

7.4. CONTRACTOR has reviewed and checked all information and data shown or indicated on the AGREEMENT Documents with respect to existing Underground Facilities at or contiguous to the site and assumes responsibility for the accurate location of said Underground Facilities. No additional examinations, investigations, explorations, tests, reports, studies or similar information or data in respect of said Underground Facilities are or will be required by CONTRACTOR in order to perform and furnish the Work at the AGREEMENT Price, within the AGREEMENT Time and in accordance with the other terms and conditions of the AGREEMENT Documents, including specifically the provisions of paragraph 4.3 of the General Conditions, as modified, if applicable, by the Supplementary Conditions.

7.5. CONTRACTOR has correlated the results of all such observations, examinations, investigations, explorations, tests, reports and studies with the terms and conditions of the AGREEMENT Documents.

7.6. CONTRACTOR has given ENGINEER written notice of all conflicts, errors or discrepancies that he has discovered in the AGREEMENT Documents and the written resolution thereof by ENGINEER is acceptable to CONTRACTOR.

#### **ARTICLE 8. AGREEMENT DOCUMENTS**

The AGREEMENT Documents which comprise the entire agreement between OWNER and CONTRACTOR concerning the Work consist of the following:

- 8.1 Invitation for Bids
- 8.2 Instructions to Bidders
- 8.3 Contractor's Bid
- 8.4 This AGREEMENT ("Agreement")
- 8.5. Exhibits to this AGREEMENT
- 8.6. General Conditions
- 8.7 Supplementary Conditions
- 8.8 Contractor's Performance and Payment Bonds, and insurance certificates
- 8.9. Notice of Award
- 8.10 Notice to Proceed
- 8.11 Specifications contained in Divisions 00100-16526A, as listed in table of contents
- 8.12 Construction Drawings
- 8.13 Addenda numbers  $\underline{1}$  to  $\underline{1}$ , inclusive.
- 8.14 Change Order

There are no AGREEMENT Documents other than those listed above in this Article 8. The AGREEMENT Documents may only be amended, modified or supplemented as provided in paragraphs 3.4 and 3.5 of the General Conditions.

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#### ARTICLE 9. INDEMNIFICATION

To the fullest extent permitted by law, the CONTRACTOR shall indemnify, defend, and hold harmless the Town of Natick and all of its officers, employees, boards, commissions, committees, agents and representatives from and against all claims, causes of action, suits, costs, damages, and liability of any kind which arise out of the breach by the CONTRACTOR of its obligations under this Contract, or the act or omission of the CONTRACTOR, its Subcontractors, or their officers, employees, agents and representatives or anyone directly or indirectly employed by them, or anyone for whose acts or omissions they may be liable, regarding the work to be performed by the CONTRACTOR under the Contract, or which arise out of the violation of any Federal, Massachusetts or Town of Natick statute, by-law, rule, regulation, order or directive, or which relate to personal injury or property damage suffered by the CONTRACTOR or any of its officers or employees regarding the subject matter of the Contract.

#### ARTICLE 10: INSURANCE

10.1. The CONTRACTOR shall provide insurance that satisfies the categories and amounts specified in Article 5 of the General Conditions, as modified by Article 5 of the Supplementary Conditions.

10.2. Each certificate and policy of insurance required by this AGREEMENT shall contain a cancellation provision as indicated below with no variations.

"Should any of the above described policies be canceled or materially amended before the expiration date thereof, the issuing insurer or the CONTRACTOR will mail within thirty (30) days written notice to the certificate holder named to the left".

10.3. The Town of Natick and ENGINEER shall be named as an additional insured on each policy of insurance required by this agreement other than worker's compensation.

#### ARTICLE 11: MISCELLANEOUS PROVISIONS

11.1. No assignment by CONTRACTOR of any rights under or interests in the AGREEMENT Documents will be binding on OWNER without the written consent of OWNER; and specifically but without limitation moneys that may become due and moneys that are due may not be assigned without such consent, and unless specifically stated to the contrary in any written consent to an assignment no assignment will release or discharge the CONTRACTOR from any duty or responsibility under the AGREEMENT Documents.

11.2. This AGREEMENT shall be binding upon the OWNER and CONTRACTOR, their respective heirs, executors, administrators, successors, or assigns and legal representative to the other party hereto, its partners, heirs, executors, successors, assigns and legal representatives in respect of all covenants, agreements and obligations contained in the AGREEMENT Documents.

11.3. If any provision of this AGREEMENT shall be determined to be invalid or unenforceable by final judgment of a court of competent jurisdiction, the remaining provisions shall continue in effect to the extent permitted by law.

11.4. This AGREEMENT may be amended only by a written instrument signed by the parties.

11.5. This AGREEMENT shall be governed by and construed in accordance with the Massachusetts law, without respect to choice of law principles.

11.6. The CONTRACTOR shall provide to the satisfaction of the OWNER, adequate supervision of all work performed under this Agreement.

11.7. This AGREEMENT shall be subject to the Natick Non-Discrimination in the Workforce provision included in Part I Supplementary Conditions.

11.8. The CONTRACTOR shall comply with all provisions of law applicable to his work including without limitation statutes, by-laws rules, regulations, orders and directives. This AGREEMENT shall be considered to include in their entirety all terms respecting workers' compensation insurance and other terms required to be included in it by Chapter 152 of the Massachusetts General Laws, as amended, and any other laws, as though such terms were set forth in their entirety herein. The CONTRACTOR shall comply with all applicable provisions of law and regulation as specified by the Williams-Steiger Occupational Safety and Health Act of 1970, as amended.

11.9. The CONTRACTOR has made this AGREEMENT in reliance on his own examinations and estimates as to the amount and character of his work, and conditions which may be encountered in the performance thereof, and shall assume all risks and bear all losses pertaining thereto.

11.10. The CONTRACTOR shall compensate the Town of Natick for all damages to the Town property of any nature arising out of the CONTRACTOR'S work.

11.11. The Town of Natick may defer payment to the CONTRACTOR of such sums otherwise due him under this AGREEMENT for such period of time as the Director of Public Works may deem required by law or expedient for protection of the Town or others against his noncompliance with the provisions thereof; and the Town may reimburse itself, by deduction from the money so retained, for all expense and loss resulting to it from his noncompliance.

11.12. No payment by the Town of Natick to the CONTRACTOR shall be deemed to be a waiver of any right of the Town of Natick under this AGREEMENT or ratification by the Town of Natick any breach hereof by him.

11.13. The CONTRACTOR shall provide services under this AGREEMENT as an independent CONTRACTOR with the town of Natick and the CONTRACTOR and its employees shall not be entitled to receive any benefits of employment with the Town of Natick, including without limitation salary, overtime, vacation pay, holiday pay, health insurance, life insurance, pension or deferred compensation.

11.14. If any assignment shall be made by the CONTRACTOR or by any guarantor of the CONTRACTOR for the benefit of creditors, or if a petition is filed by the CONTRACTOR or by any guarantor of the CONTRACTOR for adjudication as a bankrupt, or for reorganization or an arrangement under any provision of the Bankruptcy Act as then in force and effect, or if an involuntary petition under any of the provisions of the Bankruptcy Act is filed against the CONTRACTOR and such involuntary petition is not discharged within ninety (90) days thereafter, in any event the Town may terminate this AGREEMENT upon written notice to the CONTRACTOR.

11.15. The award of this AGREEMENT and the continued operation of this Contract are subject to appropriation by Natick Town Meeting of sufficient money to fund the Contract.

11.16. OWNER may terminate this AGREEMENT upon written notice to the CONTRACTOR if a source of money to fund the AGREEMENT is lost during any year of the AGREEMENT term. In the alternative, the parties may agree in writing to amend the AGREEMENT to provide for an AGREEMENT price which represents the reduced appropriation for a contract year.

11.17. In the event of termination, the CONTRACTOR shall be entitled to be paid for services rendered in accordance with this AGREEMENT prior to termination.

IN WITNESS WHEREOF, OWNER and CONTRACTOR have executed or caused to be executed by their duly authorized officials this Agreement in five (5) copies, each of which shall be deemed as an original on the date first above written. One Counterpart each has been delivered to OWNER, CONTRACTOR, ENGINEER, Town Counsel and Town Accountant.

OWNER:	CONTRACTOR:
Town of Natick, Massachusetts	Printed Name of CONTRACTOR
The Natick Board of Selectmen	
Amy K. Mistrot, Chairman	Signature
Susan G. Salamoff, Vice Chairman	Printed Name
Michael J. Hickey, Jr., Clerk	Printed Title
Jonathan H. Freedman	
Richard P. Jennett, Jr.	
Dated:	Dated:

[ CORPORATE SEAL ]

Attest

Owner Address for giving notices:

Board of Selectmen

Natick Town Hall

13 East Central Street

Natick, MA 01760

#### CERTIFICATE OF APPROPRIATION

In accordance with the requirements of M.G.L. Chapter 44, Section 31C, this is to certify that an appropriation in the amount of this Agreement is available therefore, and that the Natick Board of Selectmen is authorized to execute this Agreement and to approve all requisitions and execute change orders.

Arti P. Mehta Comptroller

Date

APPROVED AS TO FORM ONLY (AND NOT AS TO SUBSTANCE):

Karis L. North, Esq.

Date

M.J. Cataldo, Inc.

Contractor Address for giving notices:

41 Robinson Road/563 King Street

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Littleton, MA 01460

### CERTIFICATE OF CORPORATE AUTHORIZATION

T.	, Clerk of	, a	office at
pursuant to	state law, which ma	aintains its principal	office at
1	hereby certify that at	a meeting of the Boa	rd of Directors of
······	(the "Corporation") dul	ly held on	,, at which at be earlier than Lease)
		(Date mus	st be earlier than Lease)
A quorum was presen and effect:	nt and voting throughout, the	following vote was	duly passed and is now in full force
"VOTED: That		be and her	<u>eby is</u>
	e of Officer authorized to si		
authorized, directed a the corporate seal, ex Corporation, with the	and empowered for, in the nate accute, acknowledge and deli- action of Natick, acting by a	me and on behalf of ver all contracts, bon and through the Town	this Corporation to sign seal with ds and other obligations of the n of Natick, Massachusetts, 13 East lease, bond or obligation by such
upon this Corporatio this vote shall be del I further certify that	(Name of Officer) n for all purposes, and that a ivered to the Town of Natick	certificate of the Cle	rk of this Corporation setting forth
	(Name of Officer)		
		0	~
is duly elected		of said (	Corporation.
	(Title)		
Signed:			
Printed Name:			
Printed Title:	(Clerk- Secretary)		
<b>D</b>			
Date:		······································	
Place of Business:			
<u>Flace of Dusiness.</u>	AFFIX	CORPORATE SEA	<u>AL</u>
COUNTERSIGNAT	TURE:		
		Title of Officer)	
	Υ.	0 50 /	
Date:			
In the event that the	clerk or Secretary is the sam	e person as the Offic	er authorized to sign that contract
or other instrument Corporation.	for the Corporation, this cert	tificate must be count	tersigned by another officer of the

#### NATICK, MASSACHUSETTS BOARD OF SELECTMEN

#### Contractor's Certification

Name of Project\_\_\_\_\_

A contractor will not be eligible for award of a contract unless such contractor has submitted the following certification, which is deemed a part of the resulting contract:

#### CONTRACTOR'S CERTIFICATION

certifies that

- 1. it intends to use the following listed construction trades in the work under the contract ; and
- 2. will comply with the minority manpower ratio and specific affirmative action steps contained herein; and
- 3. will obtain from each of its Subcontractors and submit to the contracting or administering agency prior to the award of any subcontract under this contract the Subcontractor certification required by these bid conditions.

(Signature of authorized representative of Contractor)

Printed Name

Printed Title

Date

#### NATICK, MASSACHUSETTS BOARD OF SELECTMEN

#### Subcontractor's Certification

Name of Project\_

Prior to the award of any subcontract, regardless of tier, the prospective Subcontractor must execute and submit to the contractor the following certification, which is deemed a part of the resulting contract:

\_\_\_\_\_certifies that

- 1. it intends to use the following listed construction trades in the work under the contract ; and
- 2. will comply with the minority manpower ratio and specific affirmative action steps contained herein; and
- 3. will obtain from each of its Subcontractors and submit to the contracting or administering agency prior to the award of any subcontract under this contract the Subcontractor certification required by these bid conditions.

(Signature of authorized representative of Subcontractor)

Printed Name

Printed Title

Date

In order to ensure that the said Subcontractor's certification becomes a part of all subcontracts under the contract, no subcontract shall be executed until an authorized representative of the Town agency (or agencies) administering this project has determined, in writing, that the said certification has been incorporated in such subcontract, regardless of tier. Any subcontract executed without such written approval shall be void.

## Town of Natick, Massachusetts



PROJECT MANUAL

# For Construction of: East School Park Site Improvements

July, 2018

Owner: Town of Natick Department of Parks and Recreation

Designer: Weston & Sampson 427 Main Street, Suite 400, Worcester, MA 1 (508) 698-3034 1 (800) 726-7766 www.westonandsampson.com



transform your environment

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#### <u>BID</u>

The undersigned, as Bidder, declares that all persons or parties interested in this Bid as principals are named herein; that this Bid is bona fide, fair, and made without collusion or fraud with any person (As used in this section, the word "person" shall mean any natural person, business, joint ventures, partnership, corporation, union, committee, club, or other organization, entity or group of individuals.); that he has carefully examined the location of the proposed Work and has, read the Contract Documents; that he shall agree to contract with the Town of Natick, in the form of a Contract to be deposited with the Owner, to provide all necessary machinery, tools, apparatus and other means of construction, and to do all the work and furnish the materials and labor, specified in the Contract, in the manner and time therein prescribed, and according to the requirements of the OWNER, as therein set forth; and that he shall take in full payment therefor, the amounts resulting from the unit and/or lump sum prices which he bids in the following tabulation, when multiplied by the quantities of Work actually accomplished.

Bidder hereby agrees to commence Work under this Contract on or before the date to be indicated on the Notice to Proceed and will be completed in operating condition as soon as practicable, but no later than the time specified in the Bid Documents thereafter, unless an extension of time is granted.

Bidder acknowledges receipt of Addenda:

#1\_7/24/18 #2\_\_\_\_\_ #3\_\_\_\_\_

. For all Work presented in the Bid Documents, Bidder submits the following Bid:

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#### **BID FORM**

ITEM <u>NO.</u>	DESCRIPTION		<u>AMOUNT</u>
1. For the Turn	the total lump sum price of <u>million them hundred Siyty five thous</u> (Lump Sum Price in Words)	and=	\$ <u>274550</u> 0
Thity-	well drilling and all equipment, the allowance price of we enty Thousand Dollars and Zero Cents (Unit Price in Figures)	=	\$_35,000
	TAL BID PRICE FOR BASE BID COMPARISON tal of contractor lump sum plus allowance)		\$ <u>7300,00</u> 0

TwomIllion Three hundred thousand. (Contract Base Bid Price in Words)

#### ADDITONAL ADD ITEMS

For Tennis Court Shade Shelter to include the Shelter, footings and concrete pad, the total 1. lump sum price of:

Twenty two thousand five hundved (Lump Sum Price in Words) \$ 22,500 

For Sports Court Lighting, including poles, fixtures, controls and wiring, the total lump sum 2. price of:

One hundred ten thousand (Lump Sum Price in Words) \$<u>110,000</u> =

For Wooded Area Pathways, including site preparation, crushed aggregate pathways, benches 3. and concrete pads, the total lump sum price of:

<u>Curteen thousand five hundred</u> = \$<u>14,500</u> (Lump Sum Price in Words)

The Town will award the project based upon available funding. If funding is available beyond the base bid amount the Town will review each Additional Add Item in no particular order to determine which items can be included in the project award while staying within available funding. Bids will be compared based on base bid plus each or multiple or all Additional Add items to determine the low bidder.

An unbalanced or unreasonable lump sum or unit price submitted herein may be grounds for rejection of the Bid.

Specific items of this Contract may be eliminated or reduced in quantity to keep within limits of available funding, at the OWNER'S option.

STATEMENT OF EXPERIENCE: The undersigned as Bidder declares that he has successfully accomplished similar work in the following places:

1. Description of Project Jown of Al-Gington - Ball Field Construction (Include type of project, total value of Contract, date of

Root zone seeded field #650k June 2017 completion, etc.)

Owner & Contact Person JUNN NAISVAIL, 422 Summer St., Arlington, MA (Names, Addresses and Telephone Nos.) 02474 (781) 316 - 3880 Engineer & Contact Person Weston + Sampson, Chen Ruane (1217) 461 - 0499

2. Description of Project <u>Meccoman Field</u>, <u>Meedham</u> (Include type of project, total value of Contract, date of

Rootzone my codded field \$1,400,000 completion, etc.)

Derember 2015

Owner & Contact Person <u>TOWN OF Heedham Ed Olson</u> (Names, Addresses and Telephone Nos.)

(781) 455-7550

Engineer & Contact Person Weston + Sampson - Brendon Riley

(103) 490 - 5423 3. Description of Project <u>Eastman Trail</u> - Boardwalk Const.

(Include type of project, total value of Contract, date of

#850K December 2015 completion, etc.) Owner & Contact Person <u>Town of Needham</u>, <u>Ed 0150n</u> (Names, Addresses and Telephone Nos.) (181) 455-7550 Engineer & Contact Person <u>Weston + SampSon</u>, <u>Brendon</u> Erley <u>(1003) 490, 5423</u> 4. Description of Project <u>Liffegreen Way Fields</u>, <u>Bedford</u>, MA (Include type of project, total value of Contract, date of Construction of baseball and soccer field. completion, etc.) root zone mix sodded fields, #1,150,000 July 2017 Owner & Contact Person <u>Adrienne St. John</u>, <u>314</u> The Great Road (Names, Addresses and Telephone Nos.) Bedford, MA 01730 (781)275-7605 XIII Engineer & Contact Person Advienne Ct. John, Town Engineer 5. Description of Project Concord Academy Athletic Campus (Include type of project, total value of Contract, date of Construction of two socier and baseball fields, of completion, etc.) WITH Sand-based sour #1,150,000 2012 Owner & Contact Person Don Kingman, 166 Main St. Concerd, MA (Names, Addresses and Telephone Nos.) (181) 402 - 2267 Engineer & Contact Person Don Kingman, Facilities Director

NOTE: Bidders may attach supplementary information, if necessary, to indicate the experience, organization and equipment available to undertake the Work in the event of an award of the Contract.

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Each Bid shall be accompanied by a <u>Bid Deposit in the form of a Bid Bond, or cash, or a</u> <u>certified check on, or a treasurer's or cashier's check issued by, a responsible bank or trust company.</u> <u>payable to the awarding authority. The amount of such Bid Deposit shall be five percent (5%) of the value</u> <u>of the Bid.</u> No Bidder may withdraw his Bid for a period of thirty (30) days after the date of Bid opening, excluding Saturdays, Sundays and holidays.

A Performance Bond and a Payment Bond, each in the amount of one hundred percent (100 %) of the Contract Price, with a corporate surety approved by the OWNER, shall be required for the faithful performance of the Contract.

BIDDER: The full name and residence of all persons and parties interested in this Bid as principals, is as follows:

Joseph A Cataldo Jr 41 Robinson Road Littleton, MA 01460

This Bid shall bear the written signature of the Bidder or his authorized agent. If the Bidder is a corporation or a partnership, the Bid shall be signed by a duly authorized officer of such corporation or by a partner, and the title of such officer shall be stated. The Certificate as to Corporate Bidder Form shall be completed following this page.

The undersigned Bidder hereby certifies he/she shall comply with the minority workforce percentage ratio and specific affirmative action steps contained in the Non-Discrimination in Workforce provisions of this Contract provisions. The Contractor receiving the award of the Contract shall be required to obtain from each of its subcontractors a copy of the certification by said subcontractor, regardless of tier, that it shall comply with the minority workforce ratio and specific affirmative action steps contained in these contract provisions and submit it to the contracting agency prior to the award of such subcontract.

The undersigned, as Bidder, hereby certifies that he is aware of the applicable requirements of the Williams-Steiger Occupational Safety and Health Act of 1970 (O.S.H.A.), and all latest revisions thereto, and that this Bid is prepared on the basis of compliance with those requirements.

The undersigned, as Bidder, hereby certifies that he is able to furnish labor that can work in harmony with all other elements of labor employed or to be employed on the work. The undersigned, as Bidder, hereby certifies that all employees to be employed at the worksite shall have successfully completed a course in construction safety and health approved by the United States Occupational Safety and Health Administration that is at least ten (10) hours in duration at the time the employees begin work. The undersigned, as Bidder, hereby certifies that if it is selected as Contractor, it shall furnish documentation of successful completion of said course with the first certified payroll report for each employee. The undersigned, as Bidder, hereby certifies that he is currently in compliance with the provisions of Massachusetts General Laws, Chapter 151B, which governs nondiscrimination in employment.

The undersigned certifies under penalties of perjury that this Bid, in all respects is bona fide, fair, and has been made and submitted in good faith and without collusion or fraud with any other person. As used in this certification, the word "person" shall mean any natural person, business, joint ventures, partnership, corporation, union, committee, club, or other organization, entity or group of individuals.

The undersigned, as Bidder, hereby certifies that he shall maintain records in reasonable detail which accurately and fairly reflect the financial transactions and disposition of the Bidder, in accordance with M.G.L. Chapter 30, Section 39R.

THIS BID SUBMITTED ON JULY 2018 By ataldo Jr President + Printed Title By M. J. Cataldo, U.C. (Corporation Name) Massachusetts

(State of Incorporation

#### (Corporate Seal)

Attest (Secretary) Ing Street **Business** , MA 01460

.

Telephone Number: 97 501-6831 Email Address; pataldo mjcataldo. Com

Fax Number: 978 496-1093

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### CERTIFICATE OF NON-COLLUSION

The undersigned certifies under penalties of perjury that this Bid, in all respects is bona fide, fair, and has been made and submitted in good faith and without collusion or fraud with any other person. As used in this certification, the word "person" shall mean any natural person, business, joint ventures, partnership, corporation, union, committee, club, or other organization, entity or group of individuals.

Name of Bidder

Joseph A. Cataldo Jr.
563 King St. Littleton, MA 01460
Address of Bidder
By: Signature
Joseph A Cataldo, Tr. Printed Name
President + Treasurer Printed Title
<u>July 21, 2018</u> Date

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#### TAX COMPLIANCE CERTIFICATION

Pursuant to M.G.L. c.62C, Section 49A, the undersigned hereby certifies under penalty of perjury JOSEPH A Cataldo, Jr. has complied with all laws of the Commonwealth of Massachusetts relating to the payment of taxes, to the reporting of employees and contractors, and to the withholding and remitting of child support.

Name of Bidder

<u>JOEPPH A. Cataldo, Jr.</u> <u>303 King († Littleton, MA 01460</u> Address of Bidder // Signature By: Joseph A Cataldo Jr <u>President + Treasurer</u> Printed Title <u>JULY 26, 2018</u> Date

#### CONFLICT OF INTEREST CERTIFICATION

The Bidder named below hereby certifies that:

- The Bidder has not given, offered, or agreed to give any gift, contribution, or, offer of employment 1. as an inducement for, or in connection with, the award of a contract for these services.
- No consultant to, or, subcontractor for the Bidder has given, offered, or agreed to give any gift, 2. contribution, or, offer of employment to the Bidder, or, to any other person, corporation, or entity as an inducement for, or, in connection with, the award to the consultant or subcontractor of a contract by the Bidder.
- No person, corporation, or, other entity, other than a bona fide full time employee of the Bidder has 3. been retained or hired to solicit for or in any way assist the Bidder in obtaining the contract for services upon an agreement or understanding that such person, corporation, or entity be paid a fee or other compensation contingent upon the award of the contract to the Bidder.
- The Massachusetts Conflict of Interest Law, Chapter 268A of the Massachusetts General Laws, 4. applies to the Bidder with respect to the services outlined in the Project Manual.
- Bidder, its officers, employees, agents, subcontractors and affiliated agencies, shall not participate 5. in any activity which constitutes a violation of the Massachusetts Conflict of Interest Law or which creates an appearance of a violation of the Massachusetts Conflict of Interest Law.

Name of Bidder

Cataldo, Jr. Hleton, MA 01460 inac うしろ Address of Bidder Bγ: Signature resident + Treas July 26, 2018

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## CERTIFICATE AS TO CORPORATE BIDDER

I. Juseph A Cataldo T certify that I am the Pres, Treasur . Carrot the corporation named as Bidder in the Bid included herein; that Deeph A Catally, Who signed said Bid on behalf of the Bidder was then Pres, Treasure for said corporation; that I know his signature; that his signature thereon is genuine and that said Bid was duly signed, sealed and executed for and in behalf of said corporation by authority of its governing body.

(Corporate Seal)

Joseph A Cataldo, Jr. Name of Bidder <u>563 King Street</u> Address of Bidder

Littleton, MA 01460

978-501-6831

Bv: Signature taldo, Jr.

This Certificate shall be completed where Bidder is a Corporation and shall be so completed by its Clerk. In the event that the Clerk is the person signing the Bidder on behalf of the Corporation, this certificate shall be completed by another office of the Corporation.

# CERTIFICATE OF COMPLIANCE WITH M.G.L., C.151B

The Bidder hereby certifies that it is in compliance with and shall remain in compliance with Massachusetts General Laws (M.G.L.) Chapter 151B and shall not discriminate on any prohibited basis outlined herein.

<u>JOSEPH A Cataldo</u>, Jr. Name of Bidder <u>563 King Street</u> Address of Bidder Littleton, MA 01460 <u>978 - 501 - 10831</u> Telephone Number By: / Imp Signature <u>Faseph A Cataldo, Jr.</u> Printed Name <u>President - Treasurer</u> Printed Title July 26,2018

## CERTIFICATE OF NON-DEBARMENT

The undersigned further certifies under penalty of perjury that the said undersigned is not presently debarred from doing public construction work in the Commonwealth under the provisions of section twenty-nine F of chapter twenty-nine or any other applicable debarment provisions of any other chapter of the General Law or any rule or regulation promulgated thereunder.

. J. Cataldo, Inc. (Company Name) h(Signature title) <u>Hoseph A Cataldo, Jr.</u> Name of Bidder <u>Ze 3 King St. Littleton, MA 01460</u> Address of Bidder By: Signature JOSEPH A. Cataldo, Jr. Printed Name <u>President + Treasurer</u> Printed Title <u>July 16</u>, 2016 Date

## CERTIFICATE OF FOREIGN CORPORATION

If the Bidder is a foreign corporation, by affixing his or her signature, the Bidder certifies that the corporation is qualified under provision of M.G.L. c. 181, Section 4 to do business in the Commonwealth of Massachusetts.

JOSEPH A. Cataldo Jr. Name of Bidder 563 King Street, Littleton, MA 01460 Address of Bidder C 4m Signature By: seph A Cataldo, Jr President + Treascirer Printed Title July 20, 2018

If awarded the Contract, the Contractor shall provide with his agreement package, a certificate from the Secretary of the Commonwealth of Massachusetts that the corporation is qualified under provisions of M.G.L. c.181, Section 4, to do business in the Commonwealth.

## CONTRACT INSURANCE REQUIREMENTS

The undersigned certifies that he/she is aware of the insurance requirements of this Contract and he/she is willing and able to furnish the required insurance as specified, and that this Bid is prepared on the basis of compliance with these requirements.

Toseph A Cataldo Jr. Name of Bidder

<u>363 King (t. Little ton</u>, MA 01460 Address of Bilder

By: Signature Joseph A Cataldo, Jr. Printed Name <u>President + Treascirer</u> Printed Title

July 20, 2018

## OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION CERTIFICATION

The undersigned agrees that if he is selected as the contractor, he shall comply with the provisions of M.G.L. Chapter 30, Section 39S.

The undersigned certifies, under penalties of perjury, that he is able to furnish labor that can work in harmony with all other elements of labor employed or to be employed in the work; that all employees to be employed at the worksite shall have successfully completed a course in construction safety and health approved by the United States Occupational Safety and Health Administration that is at least ten (10) hours in duration at the time the employee begins work and who shall furnish documentation of successful completion of said course with the first certified payroll report for each employee; and that all employees to be employed in the work subject to this Bid have successfully completed a course in construction safety and health approved by the United States Occupational Safety and Health Administration that is at least ten (10) hours in duration.

<u>OSEPH A. CataldoJr.</u> Name of Bidder

5203 King St., Littleton, MA 01460 Address of Bidder Signature taldo

President + Treasu Printed Title July U, 2018 Date

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# BID BOND Document A310<sup>™</sup> – 2010

4 High Street, Suite 206

North Andover, MA 01845

SURETY:

Conforms with The American Institute of Architects AIA Document 310

Boston Indemnity Company, Inc.

(Name, legal status and principal place of business)

CONTRACTOR:

(Name, legal status and address) M.J. Cataldo, Inc.

PO Box 1343 Littleton, MA 01460

OWNER:

(Name, legal status and address) Town of Natick

MA

BOND AMOUNT: \$ Five Percent of the Attached bid (5%)

#### PROJECT:

(Name, location or address, and Project number, if any) East Park Construction

The Contractor and Surety are bound to the Owner in the amount set forth above, for the payment of which the Contractor and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, as provided herein. The conditions of this Bond are such that if the Owner accepts the bid of the Contractor within the time specified in the bid documents, or within such time period as may be agreed to by the Owner and Contractor, and the Contractor either (1) enters into a contract with the Owner in accordance with the terms of such bid, and gives such bond or bonds as may be specified in the bidding or Contract Documents, with a surety admitted in the jurisdiction of the Project and otherwise acceptable to the Owner, for the faithful performance of such Contract and for the prompt payment of labor and material furnished in the prosecution thereof; or (2) pays to the Owner may in good faith contract with another party to perform the work covered by said bid, then this obligation shall be null and void, otherwise to remain in full force and effect. The Surety hereby waives any notice of an agreement between the Owner and Contractor to extend the time in which the Owner may accept the bid. Waiver of notice by the Surety shall not apply to any extension exceeding sixty (60) days in the aggregate beyond the time for a sceptance of bids specified in the bid documents, and the Owner and Contractor shall obtain the Surety's consent for an extension beyond sixty (60) days.

If this Bond is issued in connection with a subcontractor's bid to a Contractor, the term Contractor in this Bond shall be deemed to be Subcontractor and the term Owner shall be deemed to be Contractor.

When this Bond has been furnished to comply with a statutory or other legal requirement in the location of the Project, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. When so furnished, the intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

Signed and sealed this 26th day of July, 2018

(Principa (Title (Suretv)

M.J. Cataldo, Inc. (Seal) Boston Indemnity Company, Inc. (Seal) (Title) Paul A. Patalano, Attorney-in-Fact

This document has important legal consequences. Consultation with an atlorney is encouraged with respect to its completion or modification.

Any singular reference to Contractor, Surefy, Owner or other party shall be considered plural where applicable. . \_

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## BG- 302572 Boston Indemnity Company, Inc.

KNOW ALL MEN BY THESE PRESENTS, that BOSTON INDEMNITY COMPANY, INC., a South Dakota Corporation, with its principal office in North Andover, MA, does hereby constitute and appoint:

James J. Axon, David A. Boutiette, Michael F. Carney, Richard F. Caruso, Adam W. DeSanctis, Michael T. Gilbert, Bryan F. Juwa, Gregory D. Juwa, Wilder Parks Jr., Paul A. Patalano

its true and lawful Attorney(s)-In-Fact to make, execute, seal and deliver for, and on its behalf as surety, any and all bonds, undertakings or other writings obligatory in nature of a bond.

This authority is made under and by the authority of a resolution which was passed by the Board of Directors of BOSTON INDEMNITY COMPANY, INC., on the 3<sup>rd</sup> day of November, 2015 as follows:

Resolved, that the President of the Company is hereby authorized to appoint and empower any representative of the Company or other person or persons as Attorney-In-Fact to execute on behalf of the Company any bonds, undertakings, policies, contracts of indemnity or other writings obligatory in nature of a bond not to exceed \$2,500,000.00, Two Million Five Hundred Thousand dollars which the Company might execute through its duly elected officers, and affix the seal of the Company thereto. Any said execution of such documents by an Attorney-In-Fact shall be as binding upon the Company as if they had been duly executed and acknowledged by the regularly elected officers of the Company. Any Attorney-In-Fact, so appointed, may be removed for good cause and the authority so granted may be revoked as specified in the Power of Attorney.

Resolved, that the signature of the President and the seal of the Company may be affixed by facsimile on any power of attorney granted, and the signature of the Secretary & CEO, and the seal of the Company may be affixed by facsimile to any certificate of any such power and any such power or certificate bearing such facsimile signature and seal shall be valid and binding on the Company. Any such power so executed and sealed and certificate so executed and sealed shall, with respect to any bond of undertaking to which it is attached, continue to be valid and binding on the Company.

IN WITNESS THEREOF, BOSTON INDEMNITY COMPANY, INC., has caused this instrument to be signed by its President, and its Corporate Seal to be affixed this 19th day of November, 2015.

BOSTON INDEMNITY COMPANY, INC. Marcherk DAKOTA Matthew Semeraro INSURANCE President & COO ACKNOWLEDGEMENT On this 19th day of November, 2015, before me, personally came Matthew J. Semeraro to me known, who being duly sworn, did depose and say that he is the President of BOSTON INDEMNITY COMPANY, INC., the corporation described in and which executed the above instrument; that he executed said instrument on behalf of the corporation by authority of his office under the By-laws of said corporation. BY\_\_\_\_\_Leigh Anne Haynie LEIGH ANNE HAYNIE Notary Public . COMMONWEALTH OF MASSACHUSETTS My Commission Expires Notary Public March 11, 2022 CERTIFICATE I, the undersigned, Secretary & CEO of BOSTON INDEMNITY COMPANY, INC., A South Dakota Insurance Company, DO HEREBY CERTIFY that the original Power of Attorney of which the foregoing is a true and correct copy, is in full force and effect and has not been revoked and the resolutions as set forth are now in force. Signed and Sealed at Florham Park; NJ this <u>26th</u> Day of <u>July</u>, 20<u>18</u> BΥ SOUTH DAKOTA Phillip S. Tobey INSURANCE

Secretary & CEO

"WARNING: Any person who knowingly and with intent to defraud any insurance company or other person, files and application for insurance of claim containing any materially false information, or conceals for the purpose of misleading, information concerning any fact material thereto, commits a fraudulent insurance act, which is a crime and subjects such person to criminal and civil penalties.

COMPANY

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CEDTIEICATE OF LIADILITY INCLIDANCE

CATAL-1 OP ID: LK

									07/27/2018
THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.									
IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).									
	DUCER	101001110	11(0)		CONTACT				
DeSanctis Insurance Agcy, Inc. 100 Unicorn Park Drive					PHONE (A/C, No. Ext): 781-935-8480 [A/C, No): 781-933-5645				
	burn, MA 01801				E-MAIL ADDRESS:				
					INSURER(S) AFFORDING COVERAGE				NAIC #
					INSURER A: U.S. Fire Insurance Company				21113 21105
INSC	URED MJ Cataldo, Inc. MJ Cataldo Landscap	e &			INSURER B: North River Insurance Company				10172
	Construction Corp				INSURER		<u></u>		
	PO Box 1343 Littleton, MA 01460				INSURER				
	- •				INSURER	F :			
co	OVERAGES (	ERTIFI	CATE	ENUMBER:				REVISION NUMBER:	
THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.									
INSR LTR		ADDI	SUBP WVD			POLICY EFF MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS	
A	X COMMERCIAL GENERAL LIABILITY			5000540047		03/26/2018	03/06/0040	EACH OCCURRENCE S	E00 000
	CLAIMS-MADE X OCCUR	X	X	5038542315		03/20/2010	03/26/2013	PREMISES (Ea occurrence) S MED EXP (Any one person) S	40.000
	X XCU Hazards							MED EXP (Any one person) \$ PERSONAL & ADV INJURY \$	4 000 000
	GEN'L AGGREGATE LIMIT APPLIES PER:							GENERAL AGGREGATE \$	
	POLICY X PRO- JECT LOC							PRODUCTS - COMP/OP AGG \$	2,000,000
	OTHER:							COMBINED SINGLE LIMIT	
	AUTOMOBILE LIABILITY				03/26/2018		00/00/0040	(Ea accident)	,,,
Α	ANY AUTO ALL OWNED Y SCHEDULED	X	X	1337434461		03/26/2018	03/26/2019	BODILY INJURY (Per person) \$ BODILY INJURY (Per accident) \$	
	AUTOS AUTOS							PROPERTY DAMAGE (Per accident)	
	HIRED AUTOS AUTOS							(Fer accident)	3
	X UMBRELLA LIAB X OCCUR		1	<u></u>				EACH OCCURRENCE	; 5,000,000
в	EXCESS LIAB CLAIMS-	AADE X	X	5811103017		03/26/2018	03/26/2019	AGGREGATE	; 5,000,000
ļ	UED I A REJENSIONS	)NE						V PER OTH-	5
	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY	(1)		1007002100		00/00/0040	00/00/0040	A I STATUTE   LER	1,000,000
A	ANY PROPRIETOR/PARTNER/EXECUTIVE		X 4087336482			03/20/2010	03/26/2019	E.L. EACH ACCIDENT	
	(Mandatory In NH) If yes, describe under DESCRIPTION OF OPERATIONS below							E.L. DISEASE - POLICY LIMIT	4 900 90
c	Pollution		1	G27962336003		03/10/2018	03/19/2019		2,000,000
Ŭ								Aggregate	2,000,00
DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be atlached if more space is required) Project: 18-012 CA Hobson House Enabling Project. "ADDITIONAL INSUREDS LIMITS ARE NO GREATER THAN THOSE REQUIRED BY WRITTEN CONTRACT" C. E. Floyd Company Inc., owner and all other parties as required by the contract are named as additional insureds on a primary/ noncontributory basis for all liability policies except workers compensation. Additional insured									
CE	ERTIFICATE HOLDER				CANC	ELLATION			
CEFLO-2 C.E. Floyd Company, Inc. 135 South Road					THE	SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.			
Bedford, MA 01730									
h						© 1988	-2014 ACOF	RD CORPORATION. All I	rights reserved.

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NOTEPAD:	HOLDER GODE CEFLO-2 INSURED'S NAME MJ Cataldo, Inc.	CATAL-1 OP ID: LK	PAGE 2 Date 07/27/2018
rovision provide ubrogation is pr	s coverage for ongoing & complet ovided in favor of the additions g WC except where prohibited by ce is provided, except 10 days of	ted operations. Waiver of al insureds on all	0112/12/10
ncellation noti	g WC except where prohibited by ce is provided, except 10 days f	state statute. 30 days for nonpayment of premium.	

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#### THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.

## CONTRACTOR'S SCHEDULED AND BLANKET ADDITIONAL INSUREDS

This endorsement modifies insurance provided under the following:

#### COMMERCIAL GENERAL LIABILITY COVERAGE PART

#### SCHEDULE

Name of Additional Persons or Organizations:	Designated Projects or Locations:
	<u>]</u>

- A. Section II Who Is An Insured is amended to include as an additional insured:
  - 1. Any person or organization whom you are required by "written contract" to add as an additional insured on this policy; or
  - 2. The particular person or organization, if any, scheduled above.
- B. The insurance provided to the additional insured is limited as follows:
  - 1. The person or organization is an additional insured only with respect to:
    - a. Liability for "bodily injury", "property damage" or "personal and advertising injury" caused in whole or in part by your acts or omissions or the acts or omissions of those acting on your behalf in the performance of your ongoing operations for the additional insured as specified in the "written contract"; or
    - **b.** "Bodily injury" or "property damage" included within the "products-completed operations hazard" and caused in whole or in part by "your work" specified in the "written contract", but only if:
      - (1) The "written contract" requires you to provide the additional insured such coverage;
      - (2) This policy provides such coverage; and
      - (3) The loss occurs within the period of time required by the "written contract" and prior to the expiration date of the policy.
  - 2. This policy will not provide the additional insured with any broader coverage or any higher limit of insurance than the lesser of:
    - a. Coverage afforded under this policy; or

FM 101.0.2618 04 11

Page 1 of 3

- b. Coverage required by the "written contract".
- 3. Coverage provided by this endorsement to an additional insured shall be excess over any other valid and collectible insurance available to the additional insured, whether on a primary, excess, contingent or any other basis, unless the "written contract" requires that this insurance apply on a primary and non-contributory basis.
- 4. The insurance provided to the additional insured does not apply to "bodily injury", "property damage" or "personal and advertising injury" arising out of:
  - a. An architect's, engineer's or surveyor's rendering of, or the failure to render any professional services, including:
    - (1) The preparing, approving, or failure to prepare or approve maps, shop drawings, opinions, reports, surveys, field orders, change orders or drawings and specifications; and
    - (2) Supervision or inspection performed as part of any related architectural or engineering activities; or
  - **b.** Any premises or work for which the additional insured is specifically listed as an additional insured on another endorsement attached to this policy.
- C. Section IV Commercial General Liability Conditions is amended as follows:
  - 1. The Duties In The Event Of Occurrence, Offense, Claim Or Suit condition is amended to add the following:

An additional insured under this endorsement will as soon as practicable:

- (1) Give us prompt written notice of any "occurrence" or offense which may result in a claim or "suit" under this insurance, and of any actual claim or "suit";
- (2) Except as provided in Paragraph B.3. of this endorsement, agree to make available any other insurance the additional insured has for a loss we cover under this policy;
- (3) Immediately forward all legal papers to us, cooperate with us in the investigation, defense, or settlement of the claim or "suit", and otherwise comply with the policy conditions; and
- (4) Tender the defense and indemnity of any claim or "suit" to any other insurer whose policy may provide coverage for a loss covered under this endorsement including, but not limited to, any insurer that has issued a policy under which the additional insured qualifies as an insured; however, if the "written contract" requires this insurance to be primary and non-contributory, this provision does not apply to insurance on which the additional insured is a Named Insured.

We have no duty to defend or indemnify an additional insured under this endorsement until we receive written notice of a claim or "suit" from the additional insured.

FM 101.0.2618 04 11

D. Only for the purpose of the insurance provided by this endorsement, Section V – Definitions is amended to add the following definition:

"Written contract" means a written contract or written agreement that requires you to make a person or organization an additional insured under this policy, provided the contract or agreement:

- a. Is currently in effect or becomes effective during the term of this policy; and
- b. Was signed and executed prior to the "bodily injury" or "property damage" or "personal and advertising injury" for which coverage under this policy is sought by the additional insured.

All other terms and conditions remain unchanged.

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FM 101.0.2618 04 11

### THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.

## CONTRACTORS GENERAL LIABILITY ENHANCEMENT ENDORSEMENT

This endorsement modifies insurance provided under the following:

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#### COMMERCIAL GENERAL LIABILITY COVERAGE PART

#### SCHEDULE

	1.	Expected Or Intended Injury	16.	Additional Insured – Engineers, Architects Or Surveyors		
	2.	Amended Defense Coverage For Indemnitees	17.	Additional Insured – Managers Or Lessors Of Premises		
	3.	Non-Owned Watercraft	18.	Additional Insured – State Or Governmental Agency Or Subdivision Or Political Subdivision – Permits Or Authorizations		
	4.	Non-Owned Aircraft	19.	Broad Knowledge / Notice Of Occurrence		
, 	5.	Property Damage Liability – Borrowed Equipment		Waiver Of Transfer Of Rights Of Recovery Against Others To Us		
· . ·	6,	Property Damage Liability – Elevators	21.	Unintentional Failure To Disclose Hazards		
	7.	Damage To Premises Rented To You	22.	Mental Anguish, Mental Injury Or Humiliation		
	8.	Contractual Liability For Personal And Advertising Injury		Mobile Equipment		
	9.	Medical Payments	24.	Waiver Of Sovereign Immunity		
	10.	Supplementary Payments	25.	Aggregate Limits Of Insurance Per Project		
	11.	Broad Form Named Insured	26.	Contractual Liability – Work Within 50 Feet Of Railroads		
	12.	Fellow Employee Coverage	27.	Primary Insurance – Additional Insureds By Written Contract		
	13.	Incidental Medical Malpractice Liability	28.	Liberalization Clause		
	14.	Newly Acquired Organizations	29.	Application Of This Endorsement		
	15.	Additional Insured – Lessors Of Leased Equipment				

FM 101.0.2615 04 11

Page 1 of 11

#### 1. Expected Or Intended Injury

Exclusion **a. Expected Or Intended Injury** under Section **i** – Coverage A – Bodily Injury And Property Damage Liability is hereby deleted and replaced by the following:

"Bodily injury" or "property damage" expected or intended from the standpoint of the insured. This exclusion does not apply to "bodily injury" or "property damage" resulting from the use of reasonable force to protect persons or property.

#### 2. Amended Defense Coverage For Indemnitees

Supplementary Payments - Coverages A And B is amended as follows:

Paragraph 2.d. under Section I – Supplementary Payments – Coverages A And B is hereby deleted.

Paragraph 2.e. under Section I – Supplementary Payments – Coverages A And B is hereby deleted and replaced by the following:

The indemnitee and the insured ask us to conduct and control the defense of that indemnitee against such "sult". In the event we agree a conflict exists between the interests of the insured and the interests of the indemnitee, we will select and assign separate defense counsel for the indemnitee and pay reasonable attorney fees and necessary litigation expenses; and

3. Non-Owned Watercraft

Paragraph (2)(a) of Exclusion g. Aircraft, Auto Or Watercraft under Section I – Coverage A – Bodily Injury And Property Damage Liability is hereby deleted and replaced by the following:

(a) Less than 55 feet in overall length; and

#### 4. Non-Owned Aircraft

Exclusion g. Aircraft, Auto Or Watercraft under Section I – Coverage A – Bodily Injury And Property Damage Liability does not apply to an aircraft, in which you have no ownership interest, provided:

a. It is:

- (1) Loaned to;
- (2) Rented by; or
- (3) Hired or chartered by

the insured with a paid and licensed crew;

b. It is not being used to carry persons or property for a charge; and

c. The pilot in command holds a currently effective license, issued by the duly constituted FM 101.0.2615 04 11 Page 2 of 11

authority of the United States of America or Canada, designating him or her as a commercial airline pilot for the particular aircraft being flown.

#### 5. Property Damage Liability – Borrowed Equipment

Paragraph (4) of Exclusion **j. Damage To Property** under **Section I – Coverage A – Bodily Injury And Property Damage Liability** is amended to include the following:

This exclusion does not apply to equipment which you borrow from a person or entity, other than an insured, unless the "property damage" occurs while such equipment is being used by an insured at a job site.

Subject to all terms of **Section III – Limits Of Insurance**, the maximum limit in any one "occurrence" is \$25,000 subject to an annual aggregate of \$50,000 for all "occurrences".

The insurance provided by this exception to Exclusion **j.(4)** as set forth in Paragraph **5.** of this Contractors General Liability Enhancement Endorsement is excess over any other valid and collectible insurance available to the insured whether primary, excess (other than insurance written to apply specifically in excess of this policy), contingent or any other basis, that would also apply to the loss covered under this provision.

#### 6. Property Damage Liability – Elevators

Exclusion **j. Damage To Property** under Section I – Coverage A – Bodily Injury And Property Damage Liability is amended to include the following:

Paragraphs (3) and (4) of this exclusion do not apply to liability arising out of the use of elevators.

The insurance provided by this exception to Exclusions **j.(3)** and **j.(4)** as set forth in Paragraph **6.** of this Contractors General Liability Enhancement Endorsement is excess over any other valid and collectible insurance available to the insured whether primary, excess (other than insurance written to apply specifically in excess of this policy), contingent or any other basis, that would also apply to the loss covered under this provision.

#### 7. Damage To Premises Rented To You

- a. The last paragraph of 2. Exclusions under Section I Coverage A Bodily Injury And Property Damage Liability is hereby deleted and replaced by the following:
  - (1) With respect to damage by fire to premises while rented to you or temporarily occupied by you with permission of the owner, Exclusions c. through n., do not apply.
  - (2) With respect to damage by other than fire to premises while rented to you or temporarily occupied by you with permission of the owner, Exclusions c. through n., except for Exclusion f., do not apply unless the damage arises out of "your work".

A separate limit of insurance applies to the coverage set forth in (1) and (2) above as described in Section III – Limits Of Insurance.

FM 101.0.2615 04 11

Page 3 of 11

- **b.** Section III Limits Of Insurance is amended by deleting Paragraph 6. and replacing it with the following:
  - 6. Subject to Paragraph 5. above, the Damage To Premises Rented To You Limit is the most we will pay under Coverage A for damages because of "property damage" to any one premises while rented to you or temporarily occupied by you with the permission of the owner. The Damage To Premises Rented To You Limit is the amount set forth in the Declarations or \$300,000, whichever is greater.

#### 8. Contractual Liability For Personal And Advertising Injury

Exclusion e. Contractual Liability under Section I – Coverage B – Personal And Advertising Injury Liability is amended to add the following after the last sentence:

This exclusion also does not apply to that part of any contract or agreement pertaining to your business under which you assume the "tort liability" of another party to pay for "personal and advertising injury" to a third party or organization, provided the "personal and advertising injury" offense occurs subsequent to the execution of the contract or agreement.

For the purposes of this provision, "tort liability" means a liability that would be imposed by law in the absence of any contract or agreement.

#### 9. Medical Payments

Section I – Coverage C – Medical Payments is amended to include the following only if Coverage C – Medical Payments is not otherwise excluded from this coverage part:

The Medical Payments Limit is changed to the greater of:

a. \$15,000; or

b. The Medical Expense Limit shown in the Declarations of this coverage part.

Paragraph 1.a.(3)(b) under Section I – Coverage C – Medical Payments is hereby deleted and replaced by the following:

The expenses are incurred and reported to us within three years of the date of the accident; and

#### 10. Supplementary Payments

Supplementary Payments – Coverages A And B under Section I – Coverages is amended as follows:

- a. The bail bonds limit shown in Paragraph 1.b. is increased from \$250 to \$2,500.
- b. The actual loss of earnings limit shown in Paragraph 1.d. is increased from \$250 to \$1,000.

#### FM 101.0.2615 04 11

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#### Page 4 of 11

#### 11. Broad Form Named Insured

Paragraph 1.d. under Section II - Who Is An Insured is amended to include the following:

If you are an organization other than a partnership, limited liability company or joint venture, any of your subsidiary companies or any company over which you exercise control and actively manage will qualify as an insured only if other valid and collectible insurance does not apply.

#### 12. Fellow Employee Coverage

Paragraph 2.a. (1)(a) under Section II - Who Is An Insured is hereby deleted.

#### 13. Incidental Medical Malpractice Liability

Paragraph **2.a.** (1)(d) under **Section II – Who Is An Insured** does not apply to "employees" who are employed as nurses or other "employees", excluding physicians and medical doctors, who provide incidental health care services within the scope of their employment by you.

#### 14. Newly Acquired Organizations

Paragraph **3.a.** under **Section II – Who Is An Insured is** hereby deleted and replaced by the following:

a. Coverage under this provision is afforded only until the end of the policy period.

#### 15. Additional Insured – Lessors Of Leased Equipment

Section II – Who Is An Insured is amended to include as an additional insured any person or organization from whom you lease equipment and with whom you have agreed to add as an additional insured to this policy by written contract or written agreement but only with respect to "bodily injury", "property damage" or "personal and advertising injury" caused, in whole or in part, by your maintenance, operation or use of the equipment leased to you by such person or organization.

With respect to the insurance afforded to these additional insureds, this insurance does not apply to any "occurrence" which takes place after the equipment lease expires or is terminated.

#### 16. Additional Insured - Engineers, Architects Or Surveyors

Section II – Who Is An Insured is amended to include as an additional insured any architect, engineer or surveyor engaged by you and with whom you have agreed by written contract to add as an additional insured to this policy, but only with respect to liability for "bodily Injury", "property damage" or "personal and advertising Injury" caused, in whole or in part, by your acts or omissions or the acts or omissions of those acting on your behalf:

a. In connection with your premises; or

**b.** In the performance of your ongoing operations.

With respect to the insurance afforded to these additional insureds, the following additional exclusion applies:

FM 101.0.2615 04 11

Page 5 of 11

This insurance does not apply to "bodily injury", "property damage" or "personal and advertising injury" arising out of the rendering of or the failure to render any professional services by or for you, including:

- a. The preparing, approving, or failing to prepare or approve, maps, shop drawings, opinions, reports, surveys, field orders, change orders or drawings and specifications; or
- b. Supervisory, inspection, architectural or engineering activities.

#### 17. Additional Insured – Manager Or Lessors Of Premises

Section II – Who is An Insured is amended to include as an additional insured any manager or lessor of premises leased to you and with whom you have agreed by written contract to add as an additional insured to this policy, but only with respect to liability arising out of the ownership, maintenance or use of that part of the premises leased to you and subject to the following additional exclusions:

This insurance does not apply to:

- a. Any "occurrence" which takes place after you cease to be a tenant in that premises.
- b. Structural alterations, new construction or demolition operations performed by, or on behalf of, the manager or lessor of the premises.

#### 18. Additional Insured – State Or Governmental Agency Or Subdivision Or Political Subdivision – Permits Or Authorizations

Section II – Who Is An Insured is amended to include as an additional insured any state or governmental agency or subdivision or political subdivision which has issued a permit or authorization to you.

- a. This applies only with respect to operations performed by you or on your behalf for which the state or governmental agency or subdivision or political subdivision has issued a permit or authorization.
- b. This insurance does not apply to:
  - (1) "Bodily injury", "property damage" or "personal and advertising injury" arising out of operations performed for the state or governmental agency or subdivision or political subdivision; or
  - (2) "Bodily injury" or "property damage" included within the "products-completed operations hazard".

#### 19. Broad Knowledge / Notice Of Occurrence

Section IV -- Commercial General Liability Conditions is amended to include the following:

The requirement in Condition **2.a.**, which states that you must see to it that we are notified of any "occurrence" or offense, applies only when the "occurrence" or offense is known to:

FM 101.0.2615 04 11

#### Page 6 of 11

1. You, if you are an individual;

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- 2. A partner, if you are a partnership;
- 3. A member, if you are a joint venture;
- 4. An "executive officer", manager or supervisor if you are a corporation; or
- 5. A member, if you are a limited liability company.

The requirement in Condition **2.b.**, which states that you must see to it that we receive notice of a claim or "suit", will not be considered breached unless the breach occurs after such claim or "suit" is known to:

- 1. You, if you are an individual;
- 2. A partner, if you are a partnership;
- 3. A member, if you are a joint venture;
- 4. An "executive officer", manager or supervisor if you are a corporation; or
- 5. A member, if you are a limited liability company.

If you report an accident to your Workers Compensation insurance carrier which later develops into a claim or "suit" for a liability "occurrence" for coverage which is provided by this policy, failure to report such "occurrence" to us at the time of the accident shall not be a violation of the notification of loss condition (Condition 2. Duties In The Event Of Occurrence, Offense, Claim Or Suit under Section IV – Commercial General Liability Conditions) contained in this policy. It is agreed, however, that you shall give notification of such claim or "suit" to us as soon as you are made aware of the fact that the particular accident has developed into a claim or "suit".

#### 20. Waiver Of Transfer Of Rights Of Recovery Against Others To Us

Condition 8. Transfer Of Rights Of Recovery Against Others To Us under Section IV – Commercial General Liability Conditions is amended to include the following:

We waive any right of recovery we may have against a person or organization because of payments we make for injury or damage arising out of your ongoing operations or "your work" done under a contract with that person or organization and included in the "products-completed operations hazard" when you have waived such right of recovery under a written contract with that person or organization. Such written contract must be:

- a. Currently in effect or becoming effective during the term of this policy; and
- **b.** Executed prior to the "bodily injury", "property damage" or "personal and advertising injury".

Alternatively, the written contract may be executed after the "bodily injury", "property damage" or "personal and advertising injury" but only if:

- (i) The terms and conditions of the written contract or written agreement had been agreed upon prior to the "bodily injury", "property damage" or "personal and advertising injury"; and
- (ii) The insured can definitively establish that the terms and conditions of the written contract or written agreement ultimately executed are the same as those which had

FM 101.0.2615 04 11

Page 7 of 11

been agreed upon prior to the "bodily injury", "property damage" or "personal and advertising injury".

#### 21. Unintentional Failure To Disclose Hazards

Section IV - Commercial General Liability Conditions is amended to include the following:

#### 9. Unintentional Failure To Disclose Hazards

Your unintentional failure to disclose all hazards or prior "occurrences" existing as of the inception date of this policy shall not prejudice the coverage afforded by this policy.

#### 22. Mental Anguish, Mental Injury Or Humiliation

The definition of "bodily injury" in Paragraph 3. under Section V – Definitions is hereby deleted and replaced by the following:

"Bodily injury" means bodily injury, sickness or disease sustained by a person, including mental anguish, mental injury, humiliation or death resulting from any of these at any time.

#### 23. Mobile Equipment

Paragraph 12. under Section V - Definitions is amended to include the following:

Paragraph f.(1) does not apply to self-propelled vehicles of less than 1,000 pounds gross vehicle weight.

#### 24. Waiver Of Sovereign Immunity

The following provision applies if you are a "governmental entity" or we have added a "governmental entity" to your policy as an additional insured, and the "governmental entity" requires us to obtain permission prior to asserting a defense involving governmental immunity or the jurisdiction of the tribunal over the "governmental entity":

We shall not raise any defense involving, in any way, the jurisdiction of the tribunal over the "governmental entity", the immunity of the "governmental entity" or its commissioners, officers, agents or employees, the governmental nature of such entity, or the provisions of any statutes respecting suits against the "governmental entity" without first obtaining express advance permission from the designated representative of the "governmental entity".

Application of this provision shall not subject us to liability for any portion of a claim or judgment in excess of the applicable limit of insurance.

For the purposes of this provision, "governmental entity" means a state, county, district, municipality, town, township, borough, parish, village, or other political subdivision or governmental agency or subdivision.

#### FM 101.0.2615 04 11

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Page 8 of 11

#### 25. Aggregate Limits Of Insurance Per Project

Section III - Limits Of Insurance is amended to include the following:

- 8. The General Aggregate Limit described in 2. above is subject to the following:
  - a. For all sums which the insured becomes legally obligated to pay as damages caused by "occurrences" under Section I – Coverage A, and for all medical expenses caused by accidents under Section I – Coverage C, which can be attributed only to ongoing operations at a "single construction project" away from premises owned by or rented to the insured:
    - (1) A separate Single Construction Project General Aggregate Limit applies to each construction project, and that limit is equal to the amount of the General Aggregate Limit shown in the Declarations.
    - (2) The Single Construction Project General Aggregate Limit is the most we will pay for the sum of all damages under Coverage A, except damages because of "bodily injury" or "property damage" included in the "products-completed operations hazard", and for medical expenses under Coverage C regardless of the number of:
      - (a) Insureds;

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(b) Claims made or "suits" brought; or

- (c) Persons or organizations making claims or bringing "suits".
- b. Any payments made under Coverage A for damages or under Coverage C for medical expenses shall reduce the Single Construction Project General Aggregate Limit for that construction project. Such payments shall not reduce the General Aggregate Limit shown in the Declarations nor shall they reduce any other Single Construction Project General Aggregate Limit for any other construction project.
- c. The limits shown in the Declarations for Each Occurrence, Damage To Premises Rented To You and Medical Expense continue to apply. However, instead of being subject to the General Aggregate Limit shown in the Declarations, such limits will be subject to the applicable Single Construction Project General Aggregate Limit.
- d. For all sums which the insured becomes legally obligated to pay as damages caused by "occurrences" under Section I – Coverage A, and for all medical expenses caused by accidents under Section I – Coverage C, which cannot be attributed only to ongoing operations at a "single construction project" away from premises owned by or rented to the insured:
  - (1) Any payments made under Coverage A for damages or under Coverage C for medical expenses shall reduce the amount available under the General Aggregate Limit or the Products-Completed Operations Aggregate Limit, whichever is applicable; and
  - (2) Such payments shall not reduce any Single Construction Project General Aggregate Limit.

FM 101.0.2615 04 11

Page 9 of 11

- e. When coverage for liability arising out of the "products-completed operations hazard" is provided, any payments for damages because of "bodily injury" or "property damage" included in the "products-completed operations hazard" will reduce the Products-Completed Operations Aggregate Limit, and not reduce the General Aggregate Limit nor the Single Construction Project General Aggregate Limit.
- f. If a "single construction project" away from premises owned by or rented to the insured has been abandoned or delayed and then restarted, or if the authorized contracting parties deviate from plans, blueprints, designs, specifications or timetables, the project will still be deemed to be the same construction project.
- g. "Single construction project" means each single designated construction project for which you are obligated by written agreement to maintain general liability insurance with a separate per project general aggregate limit that applies only to that construction project. The agreement must be executed prior to the "occurrence" of the "bodily injury" or "property damage".

The provisions of **Section III – Limits Of Insurance**, not otherwise modified by this provision, shall continue to apply as stipulated.

#### 26. Contractual Liability - Work Within 50 Feet Of Railroads

The definition of "insured contract" in Paragraph 9. under Section V – Definitions is amended as follows:

Paragraph 9.c. is hereby deleted and replaced by the following:

c. Any easement or license agreement;

Paragraph 9.f.(1) is hereby deleted.

#### 27. Primary Insurance - Additional Insureds By Written Contract

Paragraph a. Primary Insurance of Condition 4. Other Insurance under Section IV – Commercial General Liability Conditions is deleted and replaced by the following:

#### a. Primary Insurance

- (1) This insurance is primary except when Paragraph a.(2) or Paragraph b. below applies. If this insurance is primary, our obligations are not affected unless any of the other insurance is also primary. Then we will share with all that other insurance by the method described in Paragraph c. below.
- (2) This insurance is excess over and shall not contribute with any other valid and collectible insurance available to any person or entity added as an additional insured to this policy under the terms of the Contractors General Liability Enhancement Endorsement or by attachment of any other endorsement, regardless of whether such other insurance is provided on a primary, excess, contingent or on any other basis, unless the written contract between you and the additional insured requires that this insurance apply on a primary and/or non-contributory basis, in which case this insurance will apply in the manner required by such contract.

#### FM 101.0.2615 04 11

Page 10 of 11

#### 28. Liberalization Clause

If we adopt a change in the coverage form, CG 00 01, which broadens coverage without an additional premium charge, the broader coverage will apply to this policy on the effective date of approval in the state shown in the Named Insured's address in the Declarations of this policy.

#### 29. Application Of This Endorsement

The coverage enhancements provided by this endorsement apply to the Commercial General Liability Coverage Part. If your policy includes other endorsements in addition to this Contractors General Liability Enhancement Endorsement, and there is a conflict between any of the terms of such endorsement(s) and this Contractors General Liability Enhancement Endorsement(s) shall be given priority and control over the terms set forth in this Contractors General Liability Enhancement(s) have the effect of limiting, excluding or reducing the coverage provided under this Contractors General Liability Enhancement.

All other terms and conditions remain unchanged.

FM 101.0.2615 04 11

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Page 11 of 11

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#### Town of Natick, Massachusetts

#### **IFB: EAST PARK CONSTRUCTION**

#### ADDENDUM NO. 1

*TO*: Prospective Bidders

*PROJECT*: IFB: East Park Construction

*FROM*: Bryan R. Le Blanc Procurement Officer Natick Public Works 75 West Street Natick, MA 01760 (508)- 647-6438

*DATE*: July 24, 2018

Please also acknowledge via return correspondence upon receipt.

This addendum shall be acknowledged as indicated on the bid form, which is included with the IFB, and which shall be submitted to the Town. Failure to acknowledge Addendum No. 1 in the bid form may result in rejection of your firm's bid.

This addendum consists of nineteen (19) pages (including this one).

#### **REVISIONS TO SOLICITATION**

#### **SPECIFICATIONS**

#### ADD: 01030-ALTERNATES

#### **Contractor Questions (in order of receipt):**

- Q1: Section 01350 Permits says that the Contractor shall prepare the permit application for the NPDES Construction General Permit. Since the new 2017 CGP, the preparation of a SWPPP now involves extensive mapping, with historical and endangered species data. Will Weston & Sampson prepare the SWPPP for the General Contractor to E-File the EPA NOI?
- A1: Contractor shall be responsible for the permit application, per specifications. Weston & Sampson can provide prior mapping work done for NOI and other prior permitting.
- Q2: Can you confirm the anticipated start and completion dates?

- A2: Start date will be approx. 1 month after bid award, at issuance of notice to proceed. End date will be per specifications (July 15, 2019). <u>If extenuating circumstances</u> <u>delay issuance of the notice to proceed</u>, the completion date shall be accordingly extended.
- Q3: How many flagpoles are there? I find one on the drawings but the spec contains a 30' model and a 35' model. Please clarify.

#### A3: There is one flag pole. Flag pole shall be 30' tall.

Q4: Is there a storage shed on this project? There is a 10'x10' "Gable Shed" listed in the specs, but not shown on the drawings.

#### A4: No. Delete reference to storage shed in specifications.

Q5: The 2" perf underdrain per the detail will be 8-12" deep. The irrigation laterals per the detail will be installed 12" deep. You can't install both of these systems together without interference. Can you revise the drainage drawing?

#### A5: Irrigation Laterals shall be placed 16"-18" deep as needed.

- Q6: Fall zone of playground areas in relation to poured-in-place rubber surfacing.
- A6: Fall Heights are provided for each piece of equipment on the Kompan website (<u>https://www.kompan.us/play/organic-robinia</u>) under the "Downloads" Tab, Productsheet. Heights will also be available on a plan through Kompan's representative Erik Walsh (<u>+1 9785693797</u>)
- Q7: No specs provided for well drilling
- A7: See Specification 01031 Allowances.
- Q8: Can the invasive species (ie; knotweed and bittersweet) be disposed of at the town disposal station?
- A8: Contractor shall be responsible for proper disposal of all invasive cuttings and plant material. Coordination during construction with the town may allow for disposal at town facilities.
- Q9: Permeability requirement for root-zone mixing
- A9: Physical performance Evaluation of the root zone mix will be evaluated using the guidelines set forth in ASTM standard F 2396-04, attached as Appendix C, with the following exceptions:

Cu (Coefficient of Uniformity) = 6.0 - 8.0

Infiltration Rate (In/Hr) = 3.0 – 6.0 %Silt .002 - .05 mm = 5-7 #140 Very Fine 0.10 – 0.18 mm = 11-13 <5% #140 + #270 = 14.0-15.0 Silt to Clay Ratio = 3:1

Q10: Will the Town of Natick waive all permit fees?

#### A10: The fee is generally waived as a matter of policy for Town Projects

Q11: Please confirm fall heights for the play equipment with a detailed layout so we can accurately and economically price out the appropriate thicknesses of the poured in place surfacing system at the play areas (A simple notation next to each play equipment feature on the enlargement plan with the fall height indicated in writing would be great.)

#### A11: See Answer 6

- Q12: Please also confirm the pattern/color blends expected for the poured in place surfacing.
- A12: See Plans and Specifications- Color mixes to be determined during submittal process.
- Q13: Is the PIP surfacing to be 100% color? Or are we to use 50% color and 50% black? Please clarify.

#### A13: See Specification 2887 2.01 a2

Q14: Is the PIP surfacing required to have aliphatic binder?

#### A14: See Specification 2887 2.01 a2

Q15: Please confirm that the basis of design/bid for the play equipment is Kompan.

#### A15: Confirmed- See Specifications

Q16: I could not find an "Alternates" specification. This would be helpful in clearly describing what work is in base bid and what work is expected for each alternate so they are priced accurately.

#### A16: Please add attached Section 01030-Alternates

- Q17: Please confirm what color the colored concrete is expected to be or to be the basis of bid. There is a large variation in the price for colored concrete depending on the color chosen.
- A17: Color to be of CHROMIX Standard SG color by Scofield or approved equal. Final color to be decided during construction submittal process.

Q18: Please provide an exact thickness of existing onsite screened topsoil, imported 2mm sand and imported compost we are to carry in our bid as a basis of bid for the athletic field/rootzone soil – this will ensure all bidders are bidding apples to apples.

# A18: Borings and Test pits indicate a range of 6"-11". See Specification 0320 and appendix B.

Q19: Please clarify who pays for material and soil testing. Some areas of the spec say owner some specs say contractor. This would include but not limited to topsoil, rootzone blend, gravels, concrete, PIP surfacing, etc. Need a clear list of who owns what tests.

## A19: Contractor pays for all material and soil testing for the submittal process. Owner reserves the right to do their OWN testing at any time on any material.

- Q20: Are all stumps to ground in place or removed completely. Please clarify.
- A20: All stumps of invasive species shall be removed completely, per specifications. Stumps of non-invasive trees not located under pavement or in the way of footings, trenches, and other construction activities shall be ground to 24" below final grade, per plans.
- Q21: Please provide a treatment/removal plan for all bidders to follow for any invasive species.
- A21: See A12.

No other addenda have been issued to date. All other terms of the bid remain unaltered.

#### SECTION 01030

#### ALTERNATES

#### PART 1 GENERAL

#### 1.01 RELATED DOCUMENTS

- A. All of the Contract Documents, including the General and Supplementary Conditions and Division 0 – Bidding Documents, Contract Forms, and Conditions of the Contract and Division 1 – General Requirements, apply to the work of this Section.
- B. Carefully examine all the Contract Documents for requirements that affect the work of this Section. The exact scope of this Section cannot be determined without a thorough review of all specification sections and other Contract Documents.

#### 1.02 SUMMARY

- A. The Schedule of Alternates included in this Section lists all the Alternates which appear in the Contract Documents, and the Specification Sections which are affected by each Alternate.
- B. For each of the alternates scheduled at the end of this Section, state the amount in the proposal to be added to or deducted from the Contract Sum for the work.
- C. Consult the individual Specification Sections for detailed requirements of each Alternate.

#### 1.03 GENERAL INSTRUCTIONS

- A. Each Bidder shall be held fully responsible for examining the scope of the Alternates generally defined herein and for recognizing any modifications to his work caused by any Alternate.
- B. The Bid Alternate Price shall be complete cost, including overhead, profit, bonds, insurance, transportation, and all other costs connected with, or incidental to the work described.
- C. Alternates listed below in the Schedule of Alternates are listed in order of priority. The Town's acceptance of each Alternate must be in sequence.

#### 1.04 ALTERNATES

- A. Definition: "Alternates" are alternate products, materials, equipment, systems, methods, units of work or major elements of the construction, which may, at the Town's option and under the terms established by the Contract or Agreement, be selected for the work in lieu of the corresponding requirements of the Contract Documents.
- B. Alternate Requirements: A Schedule of Alternates is included at the end of this Section. Each alternate is defined using abbreviated language, recognizing that the Contract Documents define the requirements. Coordinate related work to ensure that work affected by each alternate is complete and properly interfaced with work of each selected alternate.
- C. Provide written proposals for each alternate on the Bid Form for the Town's consideration. Each proposal amount shall include the entire cost of the alternate portion of the work including overhead, profit, and other costs including cost of interfacing and coordinating the alternate with related and adjacent work.
- D. Notification: Immediately following award of Contract, prepare and distribute to each entity a notification of status of each alternate. Indicate which alternates have been accepted, rejected, or deferred for consideration at a later date. Include full description of negotiated modifications to alternates, if any.

#### 1.05 SCHEDULE OF ALTERNATES

- A. Alternate No. 1 Tennis Court Shade Shelter.
  - 1. Work: Installation of one tennis court shade shelter to include the shelter, footings and concrete pad complete.
  - 2. Refer to the following Specification Sections for the work of Alternate No. 1
    - a) 02300 Earthwork
    - b) 02800 Site Improvements
    - c) 03100 Concrete Formwork
    - d) 03300 Cast-In-Place Concrete
    - e) 03200 Concrete Reinforcement
- B. Alternate No. 2 Sports Court Lighting
  - 1. Work: Installation of Sports Court Lighting to include poles, fixtures, controls and wiring. Cabinets, conduit, hand holes, bases, pedestrian light fixtures,

pedestrian light fixtures wiring etc. shall be in the base bid.

- 2. Refer to the following Specification Sections for the work of Alternate No. 2:
  - a. Division 16 in its entirety
- C. Alternate No. 3 Wooded Area Pathway
  - 1. Work: Installation of the Wooded Area Pathways, including site preparation, crushed aggregate pathways, benches and concrete pads
  - 2. Refer to the following Specification Sections for the work of Alternate No. 3
    - a. 02230 Clearing and Grubbing
    - b. 02235 Tree Pruning and Tree and Stump Removals
    - c. 02300 Earthwork
    - d. 02750 Stabilized Stonedust Pavement
    - e. 02800 Site Improvements

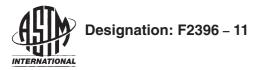
#### PART 2 PRODUCTS

Not Used.

#### PART 3 EXECUTION

Not Used.

#### END OF SECTION



#### Standard Guide for Construction of High Performance Sand-Based Rootzones for Athletic Fields<sup>1</sup>

This standard is issued under the fixed designation F2396; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon ( $\varepsilon$ ) indicates an editorial change since the last revision or reapproval.

#### 1. Scope

1.1 This guide covers techniques that are appropriate for the construction of high performance sand-based rootzones for sports fields. This guide provides guidance for the selection of materials, including soil, sand, gravel, peat, and so forth, for use in designing and constructing sand-based sports turf rootzones.

1.2 Decisions in selecting construction and maintenance techniques are influenced by existing soil types, climatic factors, level of play, intensity and frequency of use, equipment available, budget and training, and the ability of management personnel.

1.3 This guide offers an organized collection of information or a series of options and does not recommend a specific course of action. This document cannot replace education or experience and should be used in conjunction with professional judgment. Not all aspects of this guide may be applicable in all circumstances. This guide is not intended to represent or replace the standard of care by which the adequacy of a given professional service must be judged, nor should this document be applied without consideration of a project's many unique aspects. The word "standard" in the title of this document means only that the document has been approved through the ASTM consensus process.

1.4 The values stated in SI units are to be regarded as the standard. The values in parentheses are for information only.

1.5 This standard may involve hazardous materials, operations, and equipment. This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory requirements prior to use.

#### 2. Referenced Documents

2.1 ASTM Standards:<sup>2</sup>

- C88 Test Method for Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate
- C131 Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine
- C1444 Test Method for Measuring the Angle of Repose of Free-Flowing Mold Powders (Withdrawn 2005)<sup>3</sup>
- D422 Test Method for Particle-Size Analysis of Soils
- D698 Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12 400 ft-lbf/ft<sup>3</sup> (600 kN-m/m<sup>3</sup>))
- D1883 Test Method for CBR (California Bearing Ratio) of Laboratory-Compacted Soils
- D1997 Test Method for Laboratory Determination of the Fiber Content of Peat Samples by Dry Mass
- D2944 Test Method of Sampling Processed Peat Materials
- D2974 Test Methods for Moisture, Ash, and Organic Matter of Peat and Other Organic Soils
- D2976 Test Method for pH of Peat Materials
- D2980 Test Method for Volume Mass, Moisture-Holding Capacity, and Porocity of Saturated Peat Materials
- D3080 Test Method for Direct Shear Test of Soils Under Consolidated Drained Conditions
- D4427 Classification of Peat Samples by Laboratory Testing D4972 Test Method for pH of Soils
- F1632 Test Method for Particle Size Analysis and Sand Shape Grading of Golf Course Putting Green and Sports Field Rootzone Mixes
- F1647 Test Methods for Organic Matter Content of Athletic Field Rootzone Mixes
- F1815 Test Methods for Saturated Hydraulic Conductivity, Water Retention, Porosity, and Bulk Density of Athletic Field Rootzones

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<sup>&</sup>lt;sup>2</sup> For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

<sup>&</sup>lt;sup>3</sup> The last approved version of this historical standard is referenced on www.astm.org.

F2060 Guide for Maintaining Cool Season Turfgrasses on Athletic Fields

- F2107 Guide for Construction and Maintenance of Skinned Areas on Baseball and Softball Fields
- F2269 Guide for Maintaining Warm Season Turfgrasses on Athletic Fields

F2651 Terminology Relating to Soil and Turfgrass Characteristics of Natural Playing Surfaces

#### 3. Terminology

3.1 *Definitions*:

3.1.1 Except as noted, soil-related definitions are in accordance with Terminology F2651.

Note 1—Particle size ranges for sand, silt, and clay used in this standard vary somewhat from ranges given in Test Method D422.

#### 4. Significance and Use

4.1 A dense, uniform, smooth, and vigorously growing natural turfgrass sports field provides the ideal and preferred playing surface for most outdoor field sports. Such a surface is pleasing to the spectators and athletes. A thick, consistent, and smooth grass cover also increases playing quality and safety by providing stable footing for the athletes, cushioning their impact from falls, slides, or tackles, and cools the playing surface during hot weather. Sand is commonly used to construct high performance sports turf rootzone systems. Sand is chosen as the primary construction material for two basic properties, compaction resistance and improved drainage/ aeration state. Sands are more resistant to compaction than finer soil materials when played upon within a wide range of soil moisture conditions. A loamy soil that may provide a more stable surface and enhanced growing media compared to sand under optimal or normal conditions will quickly compact and deteriorate in condition if used in periods of excessive soil moisture, such as during or following a rainy season. A properly constructed sand-based rootzone, on the other hand, will resist compaction even during wet periods. Once compacted, sands are easier to decompact with the use of mechanical aeration equipment. Even when compacted, sands will retain an enhanced drainage and aeration state compared to native soil rootzones under the same level of traffic. As such, sand-based rootzones are more conducive to providing an all-weather type of playing surface. Properties of both the soil and grass plants must be considered in planning, constructing, and maintaining a high quality sports turf installation. Turfgrass utilized must be adapted to the local growing conditions and be capable of forming a thick, dense, turf cover at the desired mowing height. Unvegetated sand in and of itself is not inherently stable; therefore, it is imperative that grasses with superior wear tolerance and superior recuperative potential are utilized to withstand heavy foot traffic and intense shear forces. Sand does, however, have incredible load bearing capacity and if a dense, uniform turf cover is maintained, the sand-based system can provide a very stable, firm, smooth, and uniform playing surface. A successful sand-based rootzone system is dependent upon the proper selection of materials to use in the project. The proper selection of sand, organic amendment, soil and gravel is of vital concern to the performance of the system and this guide addresses these issues.

4.1.1 During construction, consideration should be given to factors such as the physical and chemical properties of materials used in the area, freedom from stones and other debris, and surface and internal drainage.

4.1.2 Maintenance practices that influence the playability of the surface include mowing, irrigation, fertilization, and mechanical aeration and are factors addressed in other standards (see Guides F2060 and F2269).

4.2 Those responsible for the design, construction, or maintenance, or a combination thereof, of natural turf athletic fields for high-performance, all-weather purposes will benefit from this guide.

4.3 A successful project development depends upon proper planning and upon the selection of and cooperation among design and construction team members. A high-performance, sand-based rootzone project design team should include a project designer, an agronomist or soil scientist, or both, and an owner's representative. Additions to the team during the construction phase should include an owner's project manager (often an expansion of role for the owner's representative), an owner's quality control agent (often the personnel that is employed in advance with the intent of becoming the finished project's sports field manager), an owner's testing agent (often an expansion of roles for the project's agronomist/soil scientist), and the contractor.

4.3.1 Planning for projects must be conducted well in advance of the intended construction date. This often requires numerous meetings to create a calendar of events, schedule, approvals, assessments, performance criteria, material sourcing, geotechnical reports, and construction budgets.

Note 2—Other specifications on soils for athletic field construction have been published and have been considered during the development of this guide.

#### 5. Construction

5.1 The steps to be used in construction of a new athletic field include:

5.1.1 Survey and stake the site to establish subgrade and finish grade elevations.

5.1.2 Construct and prepare subgrade, and provide a correct and certified subgrade.

5.1.3 Install subsurface drainage system, frame out warning tracks, skinned areas, and so forth, as appropriate.

5.1.4 Install irrigation system (irrigation system may be installed prior to rootzone installation).

5.1.5 Prepare for rootzone installation.

5.1.5.1 Secure suitable sand, properly tested and approved.

5.1.5.2 Blend any amendments with sand to project specifications, approve using QC program.

5.1.5.3 Install approved gravel (if included in design).

5.1.6 Install rootzone blend.

5.1.7 Bring field to final grade and contour in accordance with specifications, compact to specifications.

5.1.7.1 A pre-plant fertilizer application may be applied at this point as specified.

5.1.8 Establish turf by appropriate methods (seed, sprigs, plugs or sod).

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5.1.9 Fertilize the installation as appropriate based upon soil testing.

5.1.10 Turf is to be established based upon grow-in recommendations from a competent agronomist or soil testing laboratory, as appropriate for the turf species utilized and the climate of the site.

5.2 *Survey and Stake*—This procedure should be done to conform to the project designer's specifications as appropriate for the sport. In the case of the construction of a replacement field, this step may be deleted or modified as appropriate. Care should be taken to protect staking during the construction process.

5.3 Construct and Prepare Subgrade—Contour the subgrade in accordance with specifications at a suggested tolerance of  $\pm 12.5$  mm ( $\frac{1}{2}$  in.) within 3 m (10 ft) of linear direction as specified in 5.5.6. The subgrade should be installed at a depth such to accommodate the final profile depth of rootzone and any gravel layer (if included). The subgrade should be compacted sufficiently (suggested 85 % minimum to 90 % maximum proctor density) to prevent future settling. Subgrade should be designed to conform to surface contour of finished playing surface.

5.4 Subsurface Drainage System—Many types of designs exist for subsurface drainage most commonly including a grid or herringbone pattern. The project specifications should include a subsurface drainage design to facilitate drainage for a 25 year storm event. Most commonly used drainage systems for sand-based athletic fields include utilizing perforated drain-lines 10 cm (4 in.) in a 4.5 m (15 ft) to 6 m (20 ft) spacing between drainline laterals.

5.4.1 Drainline Trenches—Trenches constructed for drainlines should be excavated into a properly prepared, graded, and compacted subgrade. Drainage trenches should be of a depth such to conform to the drainage contours. All drainage trenches and drainline installations should maintain a minimum positive slope gradient of  $\geq 0.5 \%$  toward drainage outlets with trench bottoms compacted to subgrade specifications. Drainage excavations should be made such that a minimum of 5 cm (2 in.) of bedding material can be contained around the installed drainline (below, to each side, and above). For example, a 10 cm (4 in.) diameter drainline installation will require a minimum dimension of 20 cm (8 in.) wide by 20 cm (8 in.) depth (for example, 10 cm drainline +  $(5 \text{ cm/side} \times 2 \text{ sides}) = 20 \text{ cm}; 10$ cm drainline + 5 cm top + 5 cm bottom = 20 cm). Once drainage trenches are excavated, all excavated material should be removed from the subgrade surface and disposed off site. The subgrade should have no elevations of subgrade soil material such to hinder the flow of water along the subgrade interface into the drainage trench. Once drainage trenches have been excavated, the trench bottoms should be sufficiently compacted to the subgrade compaction specifications prior to installation of drainage system. Subgrade shall be re-surveyed and certified prior to gravel or rootzone import.

5.4.2 *Surface Drainage*—To maintain adequate surface drainage, all field installations should include a minimum of 0.5 % slope gradient (simple slope or crown) to remove water off of the playing field in case of a storm event with severe

rainfall intensity and to facilitate the use of tarps. It is recommended that an adequate number of small size surface drainage inlets be installed in the perimeter of the installation (in out-of-play areas) and tied into the drainage collection system for removal of surface runoff with the subsurface drainage water.

Note 3—In planning and designing projects, consideration shall be given to the permeability of the rootzone when determining the slope of the finished surface and the need for adjacent surface drainage systems. Further consideration shall be given in cold climates where frost penetration may impact the permeability of the rootzone when determining the slope of the finish surface and the need for adjacent surface drainage systems. Generally, the need for improved surface drainage increases as the permeability of the rootzone decreases.

5.4.3 Sub-Surface Drainage Material-Three recommended options exist for the use of drainage material. Option 1 could utilize sand rootzone material to backfill around drainlines within the drainage trenches. Option 2 could utilize gravel material to backfill around drainlines in the drainage trenches. Option 3 could include the use of gravel to backfill around drainlines in drainage trenches and to form a drainage layer overlying the subgrade before placement of rootzone sand blend. All backfill treatments shall be compacted to specifications prior to further installation procedures. It is recommended that backfill for trench bottoms is installed and compacted prior to installing drain pipe into the trenches. It is recommended that the trench bottom remain unobstructed as installed and no soil pilings, wood blocks, concrete or metal blocks are used to adjust and maintain slope of drainlines. Any blocks used for this purpose must be removed from under the drainlines and any cavities backfilled before proceeding. It is recommended that drainage trenches (bottom and sides *only*) should be lined with a woven geosynthetic filter fabric to prevent contamination (lateral movement of subgrade materials into trench fill). Geosynthetic filter fabric should *not* be used to cover the drainage trench. It is recommended that all drainlines are installed straight (without 'snaking') within the trenches. It is recommended that sleeves (of oversize PVC piping) should be installed across the drainage trenches at appropriate points as indicated by the irrigation design to facilitate irrigation pipe installation at points where the irrigation line crosses over the drainage trenches.

5.4.3.1 *Option 1*—Rootzone sand (with or without other rootzone amendments) may be utilized to backfill around drainlines. If sand is utilized for this purpose, the drainage pipe used in these installations must be of a type that utilizes slitted perforations with slit openings meeting a specification of  $D_{85}$  sand/slot width >1.5, to reduce the potential for particle migration into the drainage system (7).

5.4.3.2 Option 2—Gravel may be used for backfill of drainage trenches. If gravel is used for backfill, it should conform to the specifications in Table 1. Soft gravel minerals (such as limestone, sandstone, or shale) are not acceptable for use and all questionable gravel material should be tested for weathering stability using the sulfate soundness test (see Test Method C88). A loss of material greater than a 12 % by weight is unacceptable. Likewise, any gravel material that is suspect in its mechanical stability should be tested utilizing the LA

F2396 – 11

TABLE 1 Gravel	Filter/Drainage	Laver S	pecifications	(7,	8	)

Performance Factor	Criteria	Acceptable Value
Filtering Factors	D <sub>15</sub> of gravel/D <sub>85</sub> of rootzone mix	<5
	D <sub>50</sub> of gravel/D <sub>50</sub> of rootzone mix	<25
Permeability Factor	D <sub>15</sub> of gravel/D <sub>15</sub> of rootzone mix	≥5
Uniformity Factors	D <sub>90</sub> of gravel/D <sub>15</sub> of gravel	≤2.5
	>12 mm fraction	0 %
	<2 mm fraction	≤10 %
	<1 mm fraction	≤5 %

Abrasion test (see Test Method C131). An LA Abrasion test value greater than 40 is unacceptable.

5.4.3.3 Option 3—Gravel may be used to backfill drainage trenches and to form a drainage layer beneath the sand rootzone. If gravel is used for this purpose, the same gravel should be used for backfill and the drainage layer, and should conform to the specifications given in Table 1. Soft gravel minerals are not acceptable for use and all questionable gravel material should be tested for weathering stability using the sulfate soundness test (see Test Method C88). A loss of material greater than 12 % by weight is unacceptable. Likewise, any gravel material that is suspect in its mechanical stability should be tested utilizing the LA Abrasion test (see Test Method C131). An LA Abrasion test value greater than 40 is unacceptable. A gravel drainage layer should be a minimum of 7.5 cm (3 in.), with 10 cm to 15 cm (4 to 6 in.) preferred. During installation, the gravel is typically dumped from the delivery trucks onto the perimeter, and then distributed over the construction site by a small, tracked, crawler tractor (or similar), being careful to avoid driving over and crushing the drain lines. Contour and compact the gravel in accordance with specifications at a suggested tolerance of  $\pm 12.5$  mm (½ in.) within 3 m (10 ft) of linear direction and as specified in 5.5.6.

5.4.3.4 Discussion—If gravel is utilized as a drainage layer, it will improve the drainage of the system under conditions of saturated flow only. Saturated flow conditions typically only occur during intense or prolonged rainfall events. Under unsaturated conditions, the use of a gravel layer will impede drainage and will serve to retain additional moisture within the rootzone profile. This condition is commonly referred to as a 'perched' or 'suspended' water table. The water perched in the rootzone at the interface with the gravel will be retained in a condition nearing saturation. While such conditions may be beneficial in terms of water conservation, care must be exercised in the design of the rootzone system, such that excessive moisture is not retained that could lead to anaerobic rootzone conditions. Such conditions are common on poorly designed gravel, underdrained, sand-based rootzone systems. If a gravel underdrain system is used, the design parameters should be adjusted to assure a minimum of 15 cm (6 in.) of well aerated rootzone. If the capillary rise of salts or other contaminants from the subgrade are of concern on a particular project, the use of a gravel layer is recommended to prevent this occurrence.

5.4.3.5 Determination of Well-Aerated Rootzone Conditions—A well-aerated rootzone is normally that portion of the rootzone that retains  $\geq 20$  % air-filled porosity (AFP) after gravitational drainage ceases (as determined at 40 cm tension). To determine the depth of sand required to obtain the desired well-aerated profile depth, a soil moisture retention curve of the rootzone material must be determined. Considering that the perched water above a gravel layer will be retained at a tension of approximately 10 cm tension, the moisture retention status of the rootzone material should be considered at tensions greater than 10 cm until the proportion of air-filled pores within the rootzone material reaches 20 % or greater. For example, let's hypothesize that a soil moisture retention curve shows that a material reaches 20 % AFP at 21 cm tension. To provide a 15 cm well-aerated rootzone, our profile depth would be 21 cm (AFP threshold tension) – 10 cm (tension of perched water) + 15 cm of well-aerated rootzone, for a total rootzone depth of 26 cm. Moisture retention points should be determined utilizing methodologies in Test Method F1815.

5.5 Sand-Based Rootzone—Materials used to provide the sand for the rootzone shall meet the performance criteria established in this guide. Additions of peat or soil, or both, may be included in small proportions as part of the rootzone blend, if the inclusion of these materials will not bring the resulting blend out of specifications and if they are uniformly blended together to form a homogeneous blend.

5.5.1 Sand Type—Quartz sands are recommended; if sand contains more than 5 % calcium carbonate equivalent, the sand has the potential for particle cementation due to dissolution and reprecipitation of carbonates. Other sands are not recommended due to their propensity to weather (by either mechanical or chemical means, or both) over a relative short period of time (1 to 5 years) that may influence the performance of the construction. For example, granitic material often contains appreciable amounts of feldspar or mica which is much more readily subject to weathering. Caution should be given to sands that contain appreciable proportions of mica minerals. Mica grains have a flat or plate-like morphology and redistribution of these grains with a rootzone profile may create layers that impede drainage and aeration.

5.5.2 Particle Size Distribution—Particle size analyses (Test Methods D422 or F1632) are based on oven-dried mass of a weighed sample; shaker is the preferred method of dispersion to prevent fracturing of sand particles that may falsely influence the sand size distribution. There are many published specifications within the turf industry for sand size distribution for sand-based rootzone constructions. Many of these specifications are primarily intended for golf green construction. As such, the amount of coarse material allowed is limited in order to produce a very smooth surface under extremely short mowing conditions to facilitate smooth roll of the small golf ball. Such conditions are not required for athletic field construction and the use of higher proportion of coarser sand material can be utilized. Table 2 includes a recommended sand particle size distribution (before amendments), but is not inclusive of all size distributions of sands that could be used to produce a high performance sand-based field. Additionally:

5.5.2.1 No more than 30 % in the combined very coarse sand, fine gravel, and gravel fractions.

5.5.2.2 At least 60 % of the total sand should be in the combined medium sand and coarse sand fractions.

TABLE 2 Recommended Particle Size D	Distribution	o		
Rootzone Sand <sup>A</sup>				

Size Fraction	Particle Diameter Range	Specified Range (%)
Gravel	>4.75 mm	0 %
Gravel	3.4 to 4.75 mm	<5 %
Fine gravel	2.0 to 3.4 mm	<20 %
Very coarse sand	1.0 to 2.0 mm	<20 %
Coarse sand	0.5 to 1.0 mm	25 to 50 %
Medium sand	0.25 to 0.5 mm	>25 %
Fine sand	0.15 to 0.25 mm	<10 %
Very fine sand	0.05 to 0.15 mm	<5 %
Silt	0.002 to 0.05 mm	<5 %
Clay	<0.002 mm	<3 %

<sup>A</sup> See 5.5.2.1-5.5.2.4 for additional recommendations.

5.5.2.3 No more than 15 % in the combined fraction less than 0.25 mm (fine sand, very fine sand, silt and clay fractions). 5.5.2.4 A Coefficient of Uniformity ( $CU = D_{60}/D_{10}$ ) value of 2.5 to 4.5.

5.5.3 Sand Shape—Although acceptable sand-based rootzones can be constructed with sands of all shapes, this factor is worth consideration in athletic field construction. Sand shape is generally classed as to angularity and sphericity. Angularity includes well-rounded, rounded, subrounded, subangular, angular, and very angular. Sphericity includes high sphericity, medium sphericity, and low sphericity. Sand shape should be classified according to Figure 1 of Test Method F1632. While no sand will have sand grains of uniform shape, there is normally a predominant shape of grains from a single sand source. The shape and dimension of sand grains affect its stability. For example, rounded grains are the least stable because of the lack of edges to interlock the grains. As such the sand grains tend to act like small ball bearings. Angular sands to have greater stability because the sharper edges have a greater grain-grain interlock and resistance to shear. Sands that have a predominance of grains that show extremes in angularity (extremely angular or extremely round) that fit outside the classification in Test Method F1632 should be avoided. Likewise, extremely high or low sphericity particles should be avoided, including plate-like particles. Many dune sand sources may contain sand grains that have internal fracture planes. During the saltation process, dune sands can become rounded as they roll and skip along the surface as a function of the wind. However, during strong wind events, the grains can be moved at a high velocity, whereby the grains impacting upon each other develop 'cracks' or fracture planes within the grain. When rootzones are constructed with these sands, traffic and other weathering factors may cause the grains to fracture along these planes, resulting in the formation of silt-size quartz grains which may then be prone to particle migration and subsequent accumulation in layers. Sand grains should be examined under 20 to 50× magnification for sand size, shape, and potential fracture planes.

5.5.4 *Rootzone Amendments*—Two types of amendments are commonly included in a blend with sand that together make up the rootzone material. This would most commonly include a blend with soil or peat, or both.

5.5.4.1 *Soil*—Soil is commonly used as a component of a sand-based rootzone construction in order to provide some

enhanced capacity for moisture and nutrient retention and sometimes to improve the mechanical stability of the rootzone. Proportions of soil in a high performance rootzone mix typically range from 5 to 15 % by volume. The amount of soil to include in a blend depends upon the make-up of the soil component, and the effects of the soil additions to the physical performance characteristics of the resulting blend. Ideally, the soil component would be one that is composed purely of clay. Clay minerals generally have good moisture and nutrient retention capacities, and if present in high enough proportions may significantly improve rootzone stability by enhanced cohesive properties. When clay is included in a blend with sand in the appropriate proportion, the clay will coat the sand and form bridges between sand grains without clogging up the large pores (interstitial pores or packing voids) of the sand matrix. If a pure clay source is used, many sands will accommodate 10 to 15 % clay additions without clogging. However, care must be used in the blending and preparation process because a small increase in clay content can cause a drastic detrimental change in the performance of the rootzone. This is a primary reason for a well-designed calibration and quality control program. Other soils may be used as a component of a sand-based rootzone blend, but should be restricted to those soil textures that are low in silt content. Silt is normally a fine-grained, non-plastic soil material and is subject to migration and layering. Soils that exhibit a silt to clay ratio greater than 2 should not be used. Likewise, those soils with a fines (silt + very fine sand + fine sand) to clay ratio greater than 3 should be avoided. Generally, soils containing more than 6 % organic matter should not be used, nor any mucky-type soils. Peat may be used to increase the organic matter content in a three-way blend of sand-soil-peat.

5.5.4.2 Peat-Peat is commonly used as an amending source in a sand-based rootzone. Proportions of peat included in a blend (usually 15 to 20 % by volume) should give an organic matter content of 0.3 to 2.0 % by mass. As with soils, peat adds water and nutrient retention capacity, but will add little in terms of increased soil strength (cohesion). Peats can also slow water movement through excessively drained sands. Finer peats, whether by decomposition or by finer grinding, generally have a greater effect on slowing water movement. Three sources of peat have been used successfully to modify sands. They are moss peats (sphagnum and hypnum), reedsedge peats (derived from reeds, sedges, marsh grasses, and other plants of the wetland), and peat humus, which is decomposed peat (usually derived from moss or reed-sedge sources). Peats to avoid in modifying sands are woody peat (derived from trees and shrubs) and sedimentary peat (derived from plants that grow in water and found on pond and lake bottoms). Peats can be classified according to fiber content (see Classification D4427). In general, moss peats fall into the fibric classification, which indicates the greatest fiber content; reedsedge peats into the hemic classification (a mid-range of fiber content); and peat humus into the sapric classification (lowest fiber content). The acceptable sources of peat range in their physical and chemical properties and information in Table 3 can be utilized during the selection of a peat. Fibric peats are characterized by low ash contents, and low volume weights

TABLE 3 Suitability Ratings of Properties of Organic Amendments for Utilization in High Performance Sand-based Athletic Field Rootzones

Rating\Property	C/N Ratio	Ash Content	рН
Preferred	20:1 to 30:1	<12 %	4.5 to 7.0
Acceptable	30:1 to 50:1	12 to 17 %	3.5 to 4.5
Marginal	50:1 to 80:1	17 to 30 %	3.0 to 3.5
Unacceptable, or use only with caution	<20:1 or >80:1	>30	<3.0 or >7.0

(bulk densities). Because of a lower volume weight, a greater amount on a volume basis than with the other sources will be needed to achieve a desired organic matter content in the blend, which is reported on a mass basis. The low volume weight peats do not mix as readily as heavier peats when being mixed on-site by tillage, but this problem is largely negated by off-site mixing with various blending equipment. Off-site mixing is preferred for high performance sand-based rootzones. The fibric peats decompose more rapidly than hemic and sapric peats; however, their longevity is such that they provide benefits until organic additions from the turfgrass stand contribute significantly to the soil organic matter pool. With sphagnum moss peat, low pH may create the need for lime additions to the mix, and relatively low nitrogen (N) content and wide C/N ratio could lead to N tie-up by microorganisms and the need for additional N fertilization. Potential problems encountered with fibric peats are reduced with hemic peats, which are denser, somewhat lower in acidity, higher in N content, and more readily mixed. Also sapric, or decomposed peats, have fewer problems with pH, N content, and volume weight; however, they contain more ash and some low quality sapric peats may contain mineral soils that result in unacceptably high ash contents. The organic matter in sapric peats, already being in a somewhat decomposed state, is more stable than organic matter in the more fibrous peats. Peats considered for inclusion in high performance sand-based rootzones can be classified according to Classification D4427, and further tested by methods listed in 5.5.5.3. Suggested recommendations for peat/organic amendments for high performance sand-based rootzones are given in Table 3.

5.5.4.3 Discussion—Often the use of composts are proposed as substitutes for peat products. While in some instances, composts may produce satisfactory products for inclusion in a rootzone construction, the variability of compost products tends to be much higher than those of natural peat deposits. This variability is especially true over time and from season to season. Composts also typically contain higher ash content, may contain contaminants of soil or other earthy materials, may contain wood, and may not be completely stable in terms of chemical and physical properties. Composts may also contain high elevations of trace metals or salts, or both (although testing can be used to determine the level of these constituents). The use of composts in a high performance sand-based rootzone should be approached with a high degree of caution and employed with thorough quality control in the sourcing and construction phases. Under strict control and testing, composts have and may be used for high performance sand-based rootzone constructions. It is recommended that only compost products be used that have been used successfully in high performance sand-based field mixes in the past, and only in amounts sufficient to meet the performance parameters outlined in this guide. Mix design and testing should be performed by laboratories experienced in evaluating composts and compost amended mixes.

5.5.4.4 *Quality Control (QC) Program*—Every high performance sand-based rootzone should be constructed using a well designed and administered calibration and QC program. Such program should set the parameters to be included in the QC testing, the procedures for sampling, sampling intervals, handling the samples (chain of custody), the limits/tolerances or confidence intervals for accept/reject status within a sample, and the allowable variability of test parameters between samples.

5.5.5 *Rootzone Blending*—Rootzone blending is perhaps the most critical aspect of the construction process. Once amendment ratios are known, the components of the blend should be prepared.

5.5.5.1 *Sand*—The sand should have been previously processed, stockpiled, tested, approved, and quality control tested.

5.5.5.2 Soil—Any soil amendments should have been tested and approved and then prepared for blending by first shredding, screening, and the removal of any objectionable stones or other items. Once the soil has been prepared in this manner, the soil should be transported to the blending site for stockpiling. Once the material arrives on site, it should be protected from weather, particularly rain. During the processing and transportation of the soil component, it may be beneficial to mix or homogenize the soil material as much as is feasibly possible. Once homogenized and transported to the blending site, an additional sample should be taken and tested for conformance with the original tested material so that any adjustments in the blending proportions needed to compensate for variance in the soil stockpile may be made. It should be noted that soil components (particularly topsoils) are a potential source of weeds by seeds or plant parts. Consideration for eradication or fumigation of these materials may be warranted.

5.5.5.3 *Peat*—The peat product used for amending the sand should have been tested and approved prior to shipment of material to the blending site. Once the material arrives on site, it should be protected from weather, particularly rain. As peat is unloaded or unpackaged, it should be visually inspected for apparent uniformity within the shipment. If the project owner, project designer, or agronomist is sufficiently familiar with the peat material from past projects, the only QC testing that may be required for the peat is the calibration and QC for organic matter content of the resulting sand-peat mix. If the peat product/source is new or unfamiliar to the project personnel, additional QC tests should be performed at set testing intervals prior to blending. Peat QC test parameters may include ash content, organic matter, pH, fiber content, moisture content and volume weight (see Test Methods D1997, D2944, D2974, D2976, D2980, and Classification D4427) and C/N ratio. The above advice also applies to composts used as organic amendments.

5.5.5.4 *Blending*—The blending operation should only proceed once all of the materials have been tested and approved

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and transported to the blending site. It is recommended that blending operations proceed off-site as to the installation. Possible blending sites include: (1) the location for sand materials supply or stockpile; and (2) in an area adjacent to field site (such as a paved parking lot). The materials to be blended should be blended in a slightly moist to moist condition. Excessively wet material will not blend together properly and uniformly. Blending should be performed using commercial soil blending equipment designed for this purpose. The project designer should calculate production to include a minimum of 5 % (10 % preferred) additional rootzone material to account for shrinkage. Any leftover rootzone material could be stockpiled by the owner for use in future maintenance (topdressing) operations and for other repairs. The blending should be initiated with the preparation of a 'batch' for calibration purposes. A calibration batch stockpile is normally composed of a 100 ton minimum. The calibration batch should be sampled and tested to assure the blending equipment is properly calibrated before proceeding further. Each test for calibration may delay the blending operation 24 to 48 h, awaiting test results and recommendations from the testing laboratory. Another option would be to employ a commercial testing agent with the capacity to perform on-site testing with mobile laboratory equipment. The mobile laboratory may be utilized throughout the calibration and blending process to facilitate the logistics of the operation. It is recommended that 1 of 10 tests conducted by the mobile laboratory are duplicated at the regular laboratory facility to assure accuracy of the on-site testing data.

5.5.5.5 Stockpile Storage and Transportation—During the blending operation, and once the rootzone material has been blended and all QC approvals have been met, the stockpiled material should be protected against the effects of weather. If heavy rain is expected, the stockpiles should be covered, if possible. To protect against wind erosion of soil or organic components, the stockpiles should be kept moist on the surface of the stockpile. Once stockpiled rootzone material is to be transported to the construction site, care should be taken to ensure that the loading equipment and haul vehicles/containers are properly sanitized such to contain no foreign soil, aggregate, asphalt, and so forth that might contaminate the blended rootzone material. When the stockpile material is being picked up for loading, care should be exercised to assure that the bucket of the loading equipment is not picking up underlying soil or asphalt and that cleated tires or tracks are not 'tilling' other material into the rootzone mix.

5.5.6 *Grading Requirements*—All grades should conform to those grades and elevations as specified in the construction documents. The suggested method for grade evaluation and grade tolerances are:

5.5.6.1 For general conformance, perform an as-built survey based upon an 8 m (25 ft) grid to be within:

(1) Subgrade,  $\pm 12.5 \text{ mm} (\frac{1}{2} \text{ in.}).$ 

(2) Gravel Drainage Layer (if used),  $\pm 12.5 \text{ mm} (\frac{1}{2} \text{ in.})$ .

(3) Surface/Finish,  $\pm 6 \text{ mm} (\frac{1}{4} \text{ in.})$ .

5.5.6.2 For specific conformance and acceptability of grades between grid points (spot check), it is recommended that any observed (or suspected) high and low points be checked using a 3-m (10-ft) straight edge with tolerances based upon:

(1) Subgrade,  $\pm 12.5$  mm (<sup>1</sup>/<sub>2</sub> in.) in any linear direction.

(2) Gravel Drainage Layer (if used),  $\pm 12.5 \text{ mm} (\frac{1}{2} \text{ in.})$  in any linear direction.

(3) Surface/Finish,  $\pm 6 \text{ mm}$  (<sup>1</sup>/<sub>4</sub> in.) in any linear direction.

5.5.6.3 Grades shall be correct, certified, and approved (at each phase: subgrade, gravel layer (if used), and finish grade) by the owner or project designer, or both, prior to proceeding to the next phase of construction. Correct and certified grade shall be given by the production of an as-built drawing/diagram depicting elevation and location data that has been prepared and stamped by a licensed surveyor. The certified as-built drawing/diagram shall be submitted for approval to the owner or project designer, or both, as specified in the construction documents prior to proceeding to the next phase of the field construction.

5.6 *Installation*—Installation procedures include the installation of the drainage trench backfill material, installation of any gravel drainage layers, delivery, and installation of the rootzone material, installation of the irrigation, finish grading of the site, and then turf establishment. Rootzone installation depth shall conform to project designer's specifications. Typical rootzone placement depths range from 15 cm (6 in.) to 30 cm (12 in.) for installations without a gravel drainage layer. If a gravel drainage layer is used, the rootzone placement depth must be correlated with the desired depth of well-aerated rootzone. Typically, the profile depth of a sand-based field installed over a gravel drainage layer ranges from 23 cm (9 in.) to 40 cm (16 in.).

5.6.1 *Installation of Drainage Materials*—Drainage trench installation should be completed to the point of backfill and compaction (see 5.4.3) prior to installation of the irrigation system. If a gravel drainage layer is a component of the system design, the installation of the gravel layer should be completed following the rough installation and pressure testing of the irrigation system.

5.6.2 Installation of the Irrigation System-Irrigation system shall be designed and installed to provide head to head coverage with uniform distribution (9). Suggested irrigation design uniformity values (CUIRR or Christiansen's coefficient of uniformity) are: (1) football, soccer, or other rectangular field designs:  $\geq 90$  %; and (2) baseball/softball, cricket, or other non-rectangular field designs: ≥84 %. Irrigation pipe should be installed to a depth sufficient to be protected from mechanical aeration maintenance practices. Normally, this would be at a depth of 36 cm (14 in.) or more from finished grade. In the case of shallow profile designs of less than 20 cm (8 in.), the irrigation lateral and mainlines may be installed within the subgrade below the depth of the entire drainage system. The installation of the irrigation lines below the drainage system serves to isolate the irrigation lines from potential damage from aeration or other maintenance practices. Irrigation mainlines and lateral lines (with sleeving, if included) should be installed prior to placement of the gravel drainage layer (if used) or rootzone materials, or both. Irrigation lines crossing drainage trenches may be 'sleeved' across the drainage trench to facilitate subsequent irrigation system installation without disturbing the drainage trench system. Irrigation lines *should not* be installed within the same trenches as the drainage system in order to minimize the disturbance of one system to the other as they are being installed or repaired. The irrigation system mainlines should be pressure checked (24 h static pressure) before backfilling and prior to proceeding with the next construction phase.

5.6.2.1 *Complete Installation of Gravel Drainage Layer*—If a gravel drainage layer is used as a component of the rootzone design, this gravel layer may be installed once the irrigation system rough installation and a pressure check are completed.

5.6.3 Delivery and Installation of the Rootzone-The rootzone material should be transported to the site and dumped around the perimeter of the site. A small crawler tractor is ideally suited to spread the rootzone material working from the perimeter inward toward the center of the field. Wheeled tractors or larger tractors may cause excessive pressure that could lead to crushing of the drainage pipes, rutting of the subgrade, or over compaction of the rootzone material. As subsequent rootzone material is moved to the site for dumping, a plywood course should be constructed over the installed rootzone to facilitate the movement of trucks onto the field for dumping of the load. The plywood course not only protects the rootzone from rutting and excessive compaction, but also allows the trucks to deliver their load without becoming stuck in the sand. Under no circumstances should trucks or other equipment be allowed to travel over the uncovered subgrade. Once the delivery of the rootzone material is completed, the field may be shaped, rough-graded, and compacted as specified.

5.6.4 *Final Field Preparations*—Final field preparations include bringing the field to final grade and contour and may include pre-plant fertilization and pre-plant irrigation.

5.6.4.1 Finished Grade—Once the rootzone material has been installed and rough graded, the field should be graded to final (finish) grade and contour. It is strongly recommended that laser guided leveling equipment is specified and utilized for this critical aspect of the construction process. A smooth and uniform grade is a very important aspect of proper conditions for enhanced playability and safety of an athletic field. The specified grade and contour should conform to a  $\pm 6$ mm ( $\pm \frac{1}{4}$  in.) within 3 m (10 ft) in any lateral distance for general conformance and specific conformance as outlined in 5.5.6. Such tolerances are only achievable with laser-guided equipment. During the finish grade operation, compaction should be achieved by irrigating and rolling the surface utilizing a lightweight roller (less than 2 ton) with at least two passes in perpendicular directions. Finished grade should be within specified tolerances, correct and certified as specified (see 5.5.6) before turf installation.

Note 4—In general, as the soil component in a sand-based rootzone increases, rolling should be performed with lighter equipment also giving a higher level of attention to the moisture content of soil component. In

any case, it is recommended that when using soil components with an increased potential to compact in a blend with sand, rolling shall be done with caution.

5.6.4.2 *Pre-Plant Operations*—Pre-plant operations may include the use of a pre-plant fertilizer or other soil fertility amendment. Applications can be made as a granular product that is spread across the field or as a liquid application that is sprayed across the field or injected into the irrigation system. Once the pre-plant materials are applied, it may be desirable to lightly irrigate or 'water-in' the applied materials. Any pre-plant operations must be performed with care to avoid rutting or disruption of the final grade in any manner. Only lightweight or walk-behind equipment is advisable.

5.6.5 *Turf Installation*—The turf to be used in the athletic field project should be thoughtfully considered and specified by the project's project designer, owner, or project agronomist. It should be of a species and cultivar adapted to the local climate, capable of withstanding the stresses imposed on an athletic turf, while providing good playability and aesthetic characteristics. Depending upon turf species and cultivar selected, turf installation methods may include seeding, sprigging, plugging, or sodding. Any turf installation methods used must be carried out in a manner that protects the integrity of the finished grade. No heavy machinery such as tractors, hydrospray tanks, or trucks should be allowed on the surface, unless equipped with turf-type tires.

5.6.5.1 Seeding and Sprigging—Seeding and sprigging offer the most flexibility of the methods because they do not pose the risk of contamination of the rootzone with attached soil, they can be spread or planted mechanically or by the use of hydroseeding/hydrosprigging. If the project construction timeframe allows, seeding or sprigging are the preferred methods of establishment. Any mechanical sprigging equipment or seeders should be outfitted such to avoid disruption of finished grade. The use of heavy or large hydrosprig/hydroseed equipment intended for use in the hydroseeding or hydrosprigging of roadside and highway landscapes should be avoided, except where the equipment can be kept off the field and the hydroseed/hydrosprig material applied by use of a hose. Seeds or sprigs should be Certified turfgrass seed/sprigs (if available). Seeds or sprigs shall be free of, or below acceptable threshold levels for, objectionable or noxious weeds, foreign turfgrass cultivars, off-types of the same species, insects, nematodes, diseases, or any other objectionable material.

5.6.5.2 *Plugging*—Establishment of rapidly growing warm season turf cultivars that propagate by spreading through rhizomes or stolons (for example, seashore paspalum and bermudagrass), may be established by plugging. Plugging has some distinct advantages as an establishment method. Installed plugs have an established root system, and therefore are not as subject to stresses of drought should an interruption in water supply occur, or if limited water quantities are available for irrigation. If the growing medium of the plugs was a 'soil-less' mix, then minimum contamination of the rootzone can be expected. Plugs can be planted on a wide variety of spacings, depending upon the desired rate of grow-in desired and the turf cultivar utilized. Typical plug planting spacing ranges from 20 cm (8 in.) to 40 cm (16 in.) on center. Plugs should be free of weeds, contaminants, off-type turf, or any other objectionable

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TABLE 4 Sod-soil to Rootzone Sand Compatibility Recommendations

Criteria	Preferred	Acceptable	Marginal	Unacceptable
D <sub>50</sub> R/D <sub>50</sub> S	<2.5	2.5 to 5.0	5 to 10	>10
Silt and clay (%)	<5	5 to 10	10 to 15	>15
Silt to clay ratio	<2	2 to 5	5 to 7	>7
Gravel (>2 mm) (%)	0	0 to 2	2 to 5	>5

R = Rootzone S = Sod-soil

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material. Plugs for athletic fields are best planted by hand. Another method of plug establishment is sometimes utilized whereby a mechanical planter processes sod into irregular pieces and then plants them as 'plugs.' This method of plugging irregular sod pieces may also be used for satisfactory establishment of turf and can be done mechanically with due caution to avoid disruption or rutting of the finished grade.

5.6.5.3 *Discussion*—Plugging as used in this guide defines the use of discreet media-rooted turf plugs (as often coming in a plastic media tray). This method of plugging should not be confused with the practice of planting irregular sod pieces, which is also referred to as plugging in some areas. Plugging by the use of irregular sod pieces is a practice more closely resembling a sprigging operation and the establishment of turf by this practice should conform to the specifications as given for mechanical sprigging.

5.6.5.4 Sodding—Sodding offers the quickest establishment of any turf installation method. Sod can come in rolls or slabs of various dimension and thickness. If sod is to be used, it is preferable to wash the soil from the sod before installation to avoid contamination of the rootzone. If washed sod is not available, then only sod grown in sand or loamy sand soil should be considered. Any sod-soil considered for installation in the project should meet the criteria as outline in Table 4. Big-roll sod is the preferred sod type in order to reduce the seams in the finished installation. Sod delivery and installation procedures should be such to avoid compaction and disruption of the finished grade. (Sod may also be planted mechanically as irregular sized pieces in a process called 'plugging,' see 5.6.5.2.) Sod deliveries should be made off the field and the sod moved in on a pallet-by-pallet or roll-by-roll basis as appropriate. Specialized sod handling and installation equipment only should be used during this process to protect the finished grade. For example, with big-roll sod installations, rubbertracked handling and installation equipment is commercially available.

5.6.5.5 *Recommended Sod Specifications*—If sod is the chosen turf establishment method, the following criteria is a recommended specification for the sod to be used:

(1) Certified Turfgrass Sod—Superior sod grown from Certified (if available), high quality seed (stolons) of known origin, or from plantings of Certified grass seedlings or stolons. It shall be inspected by a sports turf consultant and owners' representative at the sod farm at which it is grown to ensure satisfactory genetic identity and purity, overall high quality, and freedom from noxious weeds, as well as excessive quantities of other crop and weedy plants at time of harvest. All seed or original plant material in mixture should be Certified.

TABLE 5 Recommended Physical Properties of the Rootzone Mix (Test Method F1815)

,	,
Physical Property	Specified Range
Total porosity	35 to 45 %
Bulk density (kg⋅m <sup>-3</sup> )	1.5 to 1.7
Air-filled porosity	15 to 25 %
Capillary porosity	15 to 25 %
Saturated hydraulic conductivity (cm/h)	≥25
(Saturated hydraulic conductivity [in./h])	(≥10)

Turfgrass sod shall meet the published state or government standards for Certification of the species and cultivar as specified.

(2) Sod may be washed (soil-less) or a special "sand base" material meeting compatibility specifications for sand-based athletic fields as given in Table 4. Sod-soil containing greater than 15 % silt and clay are unacceptable. In most cases, sod thickness should not contain a soil layer greater than 12.5 mm ( $\frac{1}{2}$  in.). Thick cut (>12.5 mm or > $\frac{1}{2}$  in.) sod may be used in cases where insufficient time exists for establishment of sod before play is initiated. In any case, sod-soil should meet appropriate compatibility criteria as given in Table 4.

(3) Strip Size—Sod shall be big roll turf cut to the supplier's standard width and length. Maximum allowable deviation from standard widths and lengths shall be plus or minus 12.5 mm ( $\frac{1}{2}$  in.) on width and plus or minus 5 % on length. Broken strips and torn or uneven ends will not be accepted.

(4) *Time Limitations*—Sod shall be harvested, delivered, and transplanted within a 12 h period unless a suitable preservation method is approved by the project designer or project agronomist prior to delivery. Sod not transplanted within this period shall be inspected and approved by the project agronomist and project designer prior to its installation.

(5) Thatch—Sod shall be relatively free of thatch. A maximum of 12.5 mm ( $\frac{1}{2}$  in.) (uncompressed) thatch will be permitted.

(6) Diseases, Nematodes, and Insects—Sod supplier should be required to supply (and warrant) sod that shall be relatively free (below established acceptable threshold levels) of diseases, parasitic nematodes, and soil-borne insects.

(7) Weeds—Sod shall be free of objectionable grassy and broad leaf weeds.

(8) Sod supplier to identify specific fields for harvest, inspection, and submit a fertility and management program schedule for 6 months prior to harvest.

#### 6. Recommended Rootzone Performance Criteria

6.1 Several criteria should be considered for proper design of high performance sand-based rootzone construction. These include physical performance criteria, chemical performance criteria, and mechanical performance criteria. The rootzone performance criteria should be considered on the entire rootzone mix rather than on any component separately.

6.2 *Recommended Physical Performance Specifications*— Physical performance criteria (as determined at 40 cm tension for water retention and air-filled porosity) include permeability or saturated hydraulic conductivity, water retention, air-filled

TABLE 6 Recommended Chemical Properties of the Rootzone Mix

Chemical Property	Specified Range
pH (Test Method D4972)	5.0 to 7.5
Calcium carbonate equivalent, preferred	<5 %
Calcium carbonate equivalent, marginal	5 to 15 %
Organic matter (Test Methods F1647)	0.5 to 2.5 %
Nutrient content	Adjust for local conditions
Heavy metals or other phytotoxic ions	Adjust for local conditions, do not exceed regulated thresholds

TABLE 7 Recommended Mechanical Properties of the Rootzone Mix

Mechanical Property	Specified Range
Friction angle (degrees) (Test Method D3080) or, alternatively	38 to 50
Angle of repose (degrees) (Test Method C1444)	35 to 45
CBR (%) (Test Method D1883)	12 to 25
Coefficient of Uniformity (CU) of sand component	2.5 to 4.5

porosity, and bulk density. The recommended physical performance criteria are given in Table 5. The physical performance criteria should be given priority over the sand size distribution specifications. 6.3 *Recommended Chemical Performance Specifications*— Chemical performance criteria include pH, calcium carbonate equivalent, organic matter content, nutrient content and the presence of any heavy metals or phytotoxic ions/substances. The recommended chemical performance criteria are given in Table 6.

6.4 Recommended Mechanical Performance Specifications—Mechanical performance criteria (for sands) includes shear resistance (specified as friction angle determined by direct, simple, or triaxial shear methodolgies (see Test Method D3080) when compacted to an initial standard proctor density of 85 % and at 40 cm soil tension (see Test Methods D698)), California Bearing Ratio (confined CBR) at 40 cm soil tension and 85 % standard proctor density (see Test Method D1883) and coefficient of uniformity (CU = D<sub>60</sub>/D<sub>10</sub>) of the sand component.

#### 7. Keywords

7.1 athletic field; baseball; clay; cricket; football; natural turf; sand; soccer; softball; soil; sports field; sports turf; turfgrass

#### APPENDIX

#### (Nonmandatory Information)

#### **X1. RESOURCE MATERIALS**

X1.1 For additional information related to sports fields, consult the following sources of information:

X1.1.1 Sports Turf Managers Association (STMA). STMA, 805 New Hampshire, Suite E, Lawrence, KS 66044, http:// www.sportsturfmanager.com.

X1.2 For additional information related to soil modification for athletic field construction, you may desire to consult the following publications:

X1.2.1 Adams, W. A., and Gibbs, R. J., *Natural Turf for Sport and Amenity: Science and Management*, (Oxford Press, 1994).

X1.2.2 Davis, W. B., Paul, J. L., and Bowman, D., "The Sand Putting Green Construction and Management," *University of California Bulletin, Publication # 21448*, University of California, ANR Communication Services, 1990.

X1.2.3 Davis, W. B., Farnham, D. S., and Gowans, K. D., "The Sand Football Field," *California Turfgrass Culture*, Vol. 24(3), 1974, pp. 17–20.

X1.2.4 Goss, R. L., and Cook, T., "Construction and Maintenance of Natural Grass Athletic Fields," *PNW Publication 0240*, Washington State University Cooperative Extension, 1983.

X1.2.5 Harper, J. C., "Athletic Fields—Specification, Outline, Construction, and Maintenance," Penn State University, 1983.

X1.2.6 Keith J. Karnok, ed., *Turfgrass Management Information Directory*, Third Edition, (Hoboken, New Jersey: John Wiley & Sons, Inc.).

X1.2.7 Landschoot, P. J., "Using Composts to Improve Turf Performance," *Cooperative Extension Circular 5M49ps5733*, Penn State University, 1996.

X1.2.8 Peacock, C. H., "Athletic Fields: Design, Construction, and Maintenance," *Bulletin 202*, University of Florida Cooperative Extension Service, Institute of Food and Agricultural Sciences, 1999.

X1.2.9 Taylor, D. H., Blake, G. R., and White, D. B., "Construction and Maintenance of Athletic Fields," *University* of Minnesota Extension Bulletin 3105, 1987.



#### REFERENCES

- (1) Soil Science Society of America, *Glossary of Soil Science Terms*, Soil Science Society of America, Madison, WI, 1997.
- (2) USDA, Soil Conservation Service, Soil Survey Staff, "Soil Taxonomy: A Basic System of Soil Classification for Making and Interpreting Soil Surveys," USDA Handbook 436, U.S. Government Print Office, 1975.
- (3) USDA, Soil Conservation Service, Soil Survey Staff, "Soil Survey Manual," USDA Handbook 18, U.S. Government Print Office, 1993.
- (4) USDA, Soil Conservation Service, Soil Survey Staff, "Keys to Soil Taxonomy," 7th ed., Pocahontas Press, Blacksburg, VA, 1997.
- (5) Dixon, J. B., and Weed, S. B., *Minerals in Soil Environments*, 2nd ed., Soil Science Society of America, Madison, WI, 1989.
- (6) Brownell, W. E., Structural Clay Products, (Applied mineralogy; v.

9), Springer-Verlag, Wien-New York, 1976.

- (7) U.S. Department of Defense, USACE, "Drainage and Erosion Control—Mobilization Construction, Chapter 5, Backfill for Subsurface Drains," *Engineering Manual EM 1110-3-136*, U.S. Government Print Office, Washington, DC, 1984, http://www.usace.army.mil/inet/ usace-docs/eng-manuals/em1110-3-136/c-5.pdf.
- (8) USGA, Green Section, USGA Recommendations For A Method Of Putting Green Construction, USGA, Golf House, Far Hills, NJ, 1993,http://www.usga.org/green/coned/greens/ recommendations.html#gravel.
- (9) Christiansen, J. E., "Irrigation by Sprinkling," *California Agricultural Experimental Station Bulletin* 670, University of California: Berkeley, CA, 1942.

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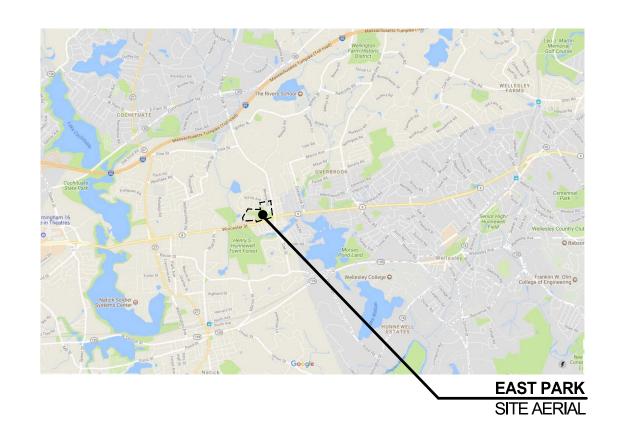


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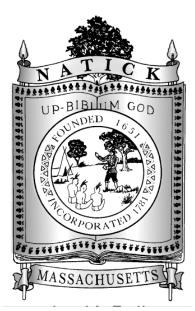
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# CONSTRUCTION DOCUMENTS

# SHEET INDEX

COVER
GENERAL NOTES
EXISTING CONDITIONS PLAN
SITE PREPARATION PLAN
MATERIALS PLAN
MATERIALS PLAN ENLARGEMENT
LAYOUT PLAN
LAYOUT PLAN ENLARGEMENT
GRADING PLAN
DRAINAGE PLAN
PLANTING PLAN
SITE CONSTRUCTION DETAILS
TOWN STANDARD SITE CONSTRUCTION DETAIL
DRAINAGE DETAILS
IRRIGATION PLAN
IRRIGATION DETAILS
ELECTRICAL LEGEND AND NOTES
EAST PARK ELECTRICAL SITE PLAN
ELECTRICAL LEGEND AND NOTES
ELECTRICAL DETAILS

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### **GENERAL NOTES**

- 1. REFER TO EXISTING CONDITIONS FOR SURVEY LEGEND. ALL BIDDERS ARE REQUIRED TO INSPECT THE PROJECT SITE IN ITS ENTIRETY PRIOR TO SUBMITTING THEIR BID, AND BECOME FAMILIAR WITH ALL CONDITIONS AS THEY MAY AFFECT THEIR BID. CONTRACTOR AND SUB-CONTRACTOR SHALL BE FAMILIAR WITH ALL DRAWINGS AND SPECIFICATIONS PRIOR TO COMMENCING THE CONSTRUCTION.
- 2. LOCATIONS OF ANY UTILITIES SHOWN ON THESE PLANS ARE APPROXIMATE ONLY. CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE LOCATION OF SUCH UTILITIES, PROTECTING ALL EXISTING UTILITIES AND REPAIRING ANY DAMAGE DONE DURING CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL ON-SITE COORDINATION WITH UTILITY COMPANIES AND PUBLIC AGENCIES AND FOR OBTAINING ALL REQUIRED PERMITS AND PAYING ALL REQUIRED FEES. IN ACCORDANCE WITH M.G.L. CHAPTER 82, SECTION 40, INCLUDING AMENDMENTS, CONTRACTORS SHALL NOTIFY ALL UTILITY COMPANIES AND GOVERNMENT AGENCIES IN WRITING PRIOR TO EXCAVATION. CONTRACTOR SHALL ALSO CALL "DIG SAFE" AT (888) 344-7233 NO LESS THAN 72 HOURS, (EXCLUSIVE OF WEEKENDS AND HOLIDAYS), PRIOR TO SUCH EXCAVATION. DOCUMENTATION OF REQUESTS SHALL BE PROVIDED TO THE PROJECT REPRESENTATIVE PRIOR TO EXCAVATION WORK.
- 3. CONTRACTOR SHALL BE RESPONSIBLE FOR REVIEWING ALL DRAWINGS AND SPECIFICATIONS TO DETERMINE THE EXTENT OF EXCAVATION AND DEMOLITION REQUIRED TO RECEIVE SITE IMPROVEMENTS.
- 4. ANY DISCREPANCIES OR CONFLICTS BETWEEN THE DRAWINGS AND EXISTING CONDITIONS, EXISTING CONDITIONS TO REMAIN, TEMPORARY CONSTRUCTION, PERMANENT CONSTRUCTION AND WORK OF ADJACENT CONTRACTS SHALL BE BROUGHT TO THE ATTENTION OF THE OWNER BEFORE PROCEEDING. ITEMS ENCOUNTERED IN AREAS OF EXCAVATION THAT ARE NOT INDICATED ON THE DRAWINGS, BUT ARE VISIBLE ON SURFACE, SHALL BE THE CONTRACTOR'S RESPONSIBILITY AND SHALL BE REMOVED AT NO ADDITIONAL COST TO THE OWNER.
- 5. ANY ALTERATIONS TO THESE DRAWINGS MADE IN THE FIELD DURING CONSTRUCTION SHALL BE RECORDED BY THE GENERAL CONTRACTOR ON "AS-BUILT" DRAWINGS.
- 6. ALL AREAS DISTURBED BY THE CONTRACTOR'S OPERATIONS OUTSIDE THE PROJECT LIMIT OF WORK, SHALL BE RESTORED TO THE ORIGINAL CONDITION BY THE CONTRACTOR AT NO ADDITIONAL COST AND TO THE SATISFACTION OF THE OWNER.
- 7. THE CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO PROTECT HIS EMPLOYEES, AS WELL AS PUBLIC USERS FROM INJURY DURING THE ENTIRE CONSTRUCTION PERIOD USING ALL NECESSARY SAFEGUARDS, INCLUDING BUT NOT LIMITED TO, THE ERECTION OF TEMPORARY WALKS, STRUCTURES, PROTECTIVE BARRIERS, COVERING, OR FENCES AS NEEDED.
- 8. THE CONTRACTOR SHALL SUPPLY THE OWNER WITH THE NAME OF THE OSHA "COMPETENT PERSON" PRIOR TO CONSTRUCTION.
- 9. FILLING OF EXCAVATED AREAS SHALL NOT TAKE PLACE WITHOUT THE PRESENCE OF THE PROJECT REPRESENTATIVE OR PERMISSION OF THE OWNER.
- 10. EXISTING TREES TO REMAIN SHALL BE PROTECTED FROM CONSTRUCTION ACTIVITIES. NO STOCKPILING OF MATERIAL, EQUIPMENT OR VEHICULAR TRAFFIC SHALL BE ALLOWED WITHIN THE DRIP LINE OF TREES TO REMAIN. NO GUYS SHALL BE ATTACHED TO ANY TREE TO REMAIN. WHEN NECESSARY OR AS DIRECTED BY THE ENGINEER, THE CONTRACTOR SHALL ERECT TEMPORARY BARRIERS FOR THE PROTECTION OF EXISTING TREES DURING CONSTRUCTION.
- 11. NO FILLING SHALL OCCUR AROUND EXISTING TREES TO REMAIN WITHOUT THE APPROVAL OF THE OWNER OR OWNER REPRESENTATIVE.
- 12. ANY QUANTITIES SHOWN ON PLANS ARE FOR COMPARATIVE BIDDING PURPOSES ONLY. IT IS THE CONTRACTOR'S RESPONSIBILITY TO VISIT THE PROJECT SITE TO VERIFY ALL QUANTITIES AND CONDITIONS PRIOR TO SUBMITTING BID.
- 13. ALL EXISTING DRAINAGE FACILITIES TO REMAIN SHALL BE MAINTAINED FREE OF DEBRIS, SOIL, SEDIMENT, AND FOREIGN MATERIAL AND OPERATIONAL THROUGHOUT THE LIFE OF THE CONTRACT. REMOVE ALL SOIL. SEDIMENT, DEBRIS AND FOREIGN MATERIAL FROM ALL DRAINAGE STRUCTURES, INCLUDING BUT NOT LIMITED TO, DRAINAGE INLETS, MANHOLES AND CATCH BASINS WITHIN THE LIMIT OF WORK AND DRAINAGE STRUCTURES OUTSIDE THE LIMIT OF WORK THAT ARE IMPACTED BY THE WORK FOR THE ENTIRE DURATION OF CONSTRUCTION.
- 14. CONTRACTOR'S STAGING AREA MUST BE WITHIN THE LIMIT OF WORK AND IN AREAS APPROVED BY OWNER. ANY OTHER AREAS THAT THE CONTRACTOR MAY WISH TO USE FOR STAGING MUST BE COORDINATED WITH THE OWNER.
- 15. THE CONTRACTOR SHALL BROOM SWEEP AND CLEAN ALL STREETS, PARKING LOTS AND WALKS THAT ARE NOT RESTRICTED FROM PUBLIC USE DURING CONSTRUCTION AT ALL TIMES. THE CONTRACTOR SHALL USE ACCEPTABLE METHODS AND MATERIALS TO MAINTAIN ADEQUATE DUST CONTROL THROUGHOUT CONSTRUCTION.
- 16. CONTRACTOR SHALL COORDINATE ALL WORK WITH THE OWNER.

## **EROSION AND SEDIMENT CONTROL NOTES**

- 1. ALL SEDIMENT AND EROSION CONTROL DEVICES SHALL BE PUT INTO PLACE PRIOR TO BEGINNING ANY CONSTRUCTION OR DEMOLITION. REFER TO PLAN FOR APPROXIMATE LOCATION OF EROSION AND SEDIMENT CONTROL. REFER TO SPECS AND DETAILS FOR TYPE OF EROSION AND SEDIMENT CONTROL.
- 2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE CONTINUAL MAINTENANCE OF ALL CONTROL DEVICES THROUGHOUT THE DURATION OF THE PROJECT.
- 3. CONTRACTOR SHALL MEET ALL OF THE STATE OF MASSACHUSETTS D.E.P. AND THE TOWN OF NATICK'S WETLAND ORDINANCE REGULATIONS FOR SEDIMENT AND EROSION CONTROL.
- 4. EXCAVATED MATERIAL STOCKPILED ON THE SITE SHALL BE SURROUNDED BY A RING OF UNBROKEN SEDIMENT AND EROSION CONTROL FENCE. THE LIMITS OF ALL GRADING AND DISTURBANCE SHALL BE KEPT TO A MINIMUM WITHIN THE APPROVED AREA OF CONSTRUCTION. ALL AREAS OUTSIDE OF THE LIMIT OF CONTRACT SHALL REMAIN TOTALLY UNDISTURBED UNLESS OTHERWISE APPROVED BY OWNER'S REPRESENTATIVE.
- 5. ALL CATCH BASINS AND DRAIN GRATES WITHIN LIMIT OF WORK SHALL BE PROTECTED WITH FILTER FABRIC DURING THE ENTIRE DURATION OF CONSTRUCTION.
- 6. EROSION CONTROL BARRIERS TO BE INSTALLED AT THE TOE OF SLOPES. SEE GRADING & DRAINAGE PLANS, NOTES, DETAILS AND SPECIFICATIONS.
- 7. THE CONTRACTOR SHALL PROVIDE DUST CONTROL FOR CONSTRUCTION OPERATIONS AS APPROVED BY OWNER.
- 8. ALL POINTS OF CONSTRUCTION EGRESS OR INGRESS SHALL BE MAINTAINED TO PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC/PRIVATE ROADS.

# **DEMOLITION & SITE PREPARATION NOTES**

- COST TO THE OWNER.
- REPRESENTATIVE AT NO ADDITIONAL COST.
- SPECIFICATIONS FOR GRAVEL BORROW.
- OTHERWISE.
- CONTROLS.

### **GRADING & DRAINAGE NOTES**

- STANDARDS OF THE TOWN OF NATICK.

- WORK.
- AT THE END OF THE PROJECT.
- OWNER.
- TOP AND BOTTOM OF SLOPES.

- PROCEDURES.

1. THE CONTRACTOR SHALL INCLUDE IN THE BID THE COST OF REMOVING ANY EXISTING SITE FEATURES AND APPURTENANCES NECESSARY TO ACCOMPLISH THE CONSTRUCTION OF THE PROPOSED SITE IMPROVEMENTS. THE CONTRACTOR SHALL ALSO INCLUDE IN THE BID THE COST NECESSARY TO RESTORE SUCH ITEMS IF THEY ARE SCHEDULED TO REMAIN AS PART OF THE FINAL SITE IMPROVEMENTS. REFER TO PLANS TO DETERMINE EXCAVATION. DEMOLITION AND TO DETERMINE THE LOCATION OF THE PROPOSED SITE IMPROVEMENTS.

2. THE OWNER RESERVES THE RIGHT TO REVIEW ALL MATERIALS DESIGNATED FOR REMOVAL AND TO RETAIN OWNERSHIP OF SUCH MATERIALS. IF THE OWNER RETAINS ANY MATERIAL THE CONTRACTOR SHALL MAKE ARRANGEMENTS WITH THE OWNER TO HAVE THOSE MATERIALS REMOVED OFF SITE AT NO ADDITIONAL COST.

3. UNLESS SPECIFICALLY NOTED TO BE SAVED / STOCKPILED (R&S) OR REUSED / RELOCATED (R&R), ALL SITE FEATURES CALLED FOR REMOVAL (R&D/ REM) SHALL BE REMOVED WITH THEIR FOOTINGS, ATTACHMENTS, BASE MATERIAL, ETC, TRANSPORTED FROM THE SITE TO BE DISPOSED OF IN A LAWFUL MANNER AT AN ACCEPTABLE DISPOSAL SITE AND AT NO

4. ALL EXISTING SITE FEATURES TO REMAIN SHALL BE PROTECTED THROUGHOUT THE CONSTRUCTION PERIOD. ANY FEATURES DAMAGED DURING CONSTRUCTION OPERATIONS SHALL BE REPAIRED OR REPLACED TO THE SATISFACTION OF THE OWNER'S

5. DURING EARTHWORK OPERATIONS, CONTRACTOR SHALL TAKE CARE TO NOT DISTURB EXISTING MATERIALS TO REMAIN, OUTSIDE THE LIMITS OF EXCAVATION AND BACKFILL AND SHALL TAKE WHATEVER MEASURES NECESSARY, AT THE CONTRACTOR'S EXPENSE, TO PREVENT ANY EXCAVATED MATERIAL FROM COLLAPSING. ALL BACKFILL MATERIALS SHALL BE PLACED AND COMPACTED AS SPECIFIED TO THE SUBGRADE REQUIRED FOR THE INSTALLATION OF THE REMAINDER OF THE CONTRACT WORK.

6. IT SHALL BE THE CONTRACTOR'S OPTION, WITH CONCURRENCE OF THE OWNER, TO REUSE EXISTING GRAVEL PAVEMENT BASE COURSE IF IT MEETS THE REQUIREMENTS OF THE

7. ALL ITEMS CALLED FOR REMOVAL SHALL BE REMOVED TO FULL DEPTH INCLUDING ALL FOOTINGS, FOUNDATIONS, AND OTHER APPURTENANCES, EXCEPT AS SPECIFICALLY NOTED

8. 'CLEAR AND GRUB VEGETATION' INDICATED ON PLAN SHALL INCLUDE REMOVAL OF SHRUBS AND UNDERBRUSH, REMOVAL OF ROOTS, AND STUMPS COMPLETE.

9. "STRIP & STORE OR SKIM & STOCKPILE" EXISTING TOPSOIL FOR LATER REUSE WHERE APPROPRIATE, AND AS NOTED ON PLAN, WITH APPROPRIATE EROSION AND SEDIMENT

10. LOAM / TOPSOIL DESIGNATED FOR REUSE AS GENERAL FILL SHALL BE BLENDED WITH SUITABLE BORROW MATERIAL AS SPECIFIED.

11. TREES DESIGNATED FOR REMOVAL SHALL BE TAGGED BY CONTRACTOR AND APPROVED BY OWNER'S REPRESENTATIVE PRIOR TO COMMENCEMENT OF CONSTRUCTION.

12. THE CONTRACTOR SHALL PROTECT EXISTING TREES TO REMAIN. CONTRACTOR SHALL INSTALL TREE PROTECTION BARRIER AFTER CLEARING UNDERBRUSH AND TAKE DUE CARE TO PREVENT INJURY TO TREES DURING CLEARING OPERATIONS.

13. THE STORAGE OF MATERIALS AND EQUIPMENT WILL BE PERMITTED AT LOCATIONS DESIGNATED BY OWNER OR OWNER'S REPRESENTATIVE. PROTECTION OF STORED MATERIALS AND EQUIPMENT SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR

1. ALL WORK RELATING TO INSTALLATION, RENOVATION OR MODIFICATION OF WATER. DRAINAGE AND/OR SEWER SERVICES SHALL BE PERFORMED IN ACCORDANCE WITH THE

2. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND GRADES ON THE GROUND AND REPORT ANY DISCREPANCIES IMMEDIATELY TO THE OWNER.

3. CONTRACTOR SHALL MAINTAIN POSITIVE DRAINAGE (1.5% MINIMUM) AWAY FROM ALL BUILDING FOUNDATIONS AND STRUCTURES.

4. CONTRACTOR SHALL ENSURE ALL AREAS ARE PROPERLY PITCHED TO DRAIN. WITH NO SURFACE WATER PONDING OR PUDDLING.

5. ALL NEW WALKWAYS / ACCESS PATHS MUST CONFORM TO CURRENT AMERICANS WITH DISABILITIES ACT (ADA) REGULATIONS: WALKWAYS SHALL MAINTAIN A CROSS PITCH OF NOT MORE THAN ONE AND A HALF (1.5%) PERCENT AND THE RUNNING SLOPE (PARALLEL TO THE DIRECTION OF TRAVEL) BETWEEN 1% MIN. AND 5% MAX. ANY DISCREPANCIES NOT ALLOWING THIS TO OCCUR SHALL BE REPORTED TO THE OWNER PRIOR TO CONTINUING

6. ALL UTILITY GRATES, COVERS OR OTHER SURFACE ELEMENTS INTENDED TO BE EXPOSED AT GRADE SHALL BE FLUSH WITH THE ADJACENT FINISHED GRADE AND ADJUSTED TO PROVIDE A SMOOTH TRANSITION AT ALL EDGES.

7. THE CONTRACTOR SHALL SET SUBGRADE ELEVATIONS TO ALLOW FOR POSITIVE DRAINAGE AND PROVIDE EROSION CONTROL DEVICES, STRUCTURES, MATERIALS AND CONSTRUCTION METHODS TO DIRECT SILT MIGRATION AWAY FROM DRAINAGE AND OTHER UTILITY SYSTEMS, PUBLIC/PRIVATE STREETS AND WORK AREAS. CLEAN BASINS REGULARLY AND

8. EXCAVATION REQUIRED WITHIN PROXIMITY OF KNOWN EXISTING UTILITY LINES SHALL BE DONE BY HAND. CONTRACTOR SHALL REPAIR ANY DAMAGE TO EXISTING UTILITY LINES OR STRUCTURES INCURRED DURING CONSTRUCTION OPERATIONS AT NO COST TO THE

9. WHERE NEW EARTHWORK MEETS EXISTING GRADES, CONTRACTOR SHALL BLEND NEW EARTHWORK SMOOTHLY INTO EXISTING, PROVIDING VERTICAL CURVES OR ROUNDS AT ALL

10. WHERE A SPECIFIC LIMIT OF WORK LINE IS NOT OBVIOUS OR IMPLIED, BLEND GRADES TO EXISTING CONDITIONS WITHIN 5 FEET OF PROPOSED CONTOURS.

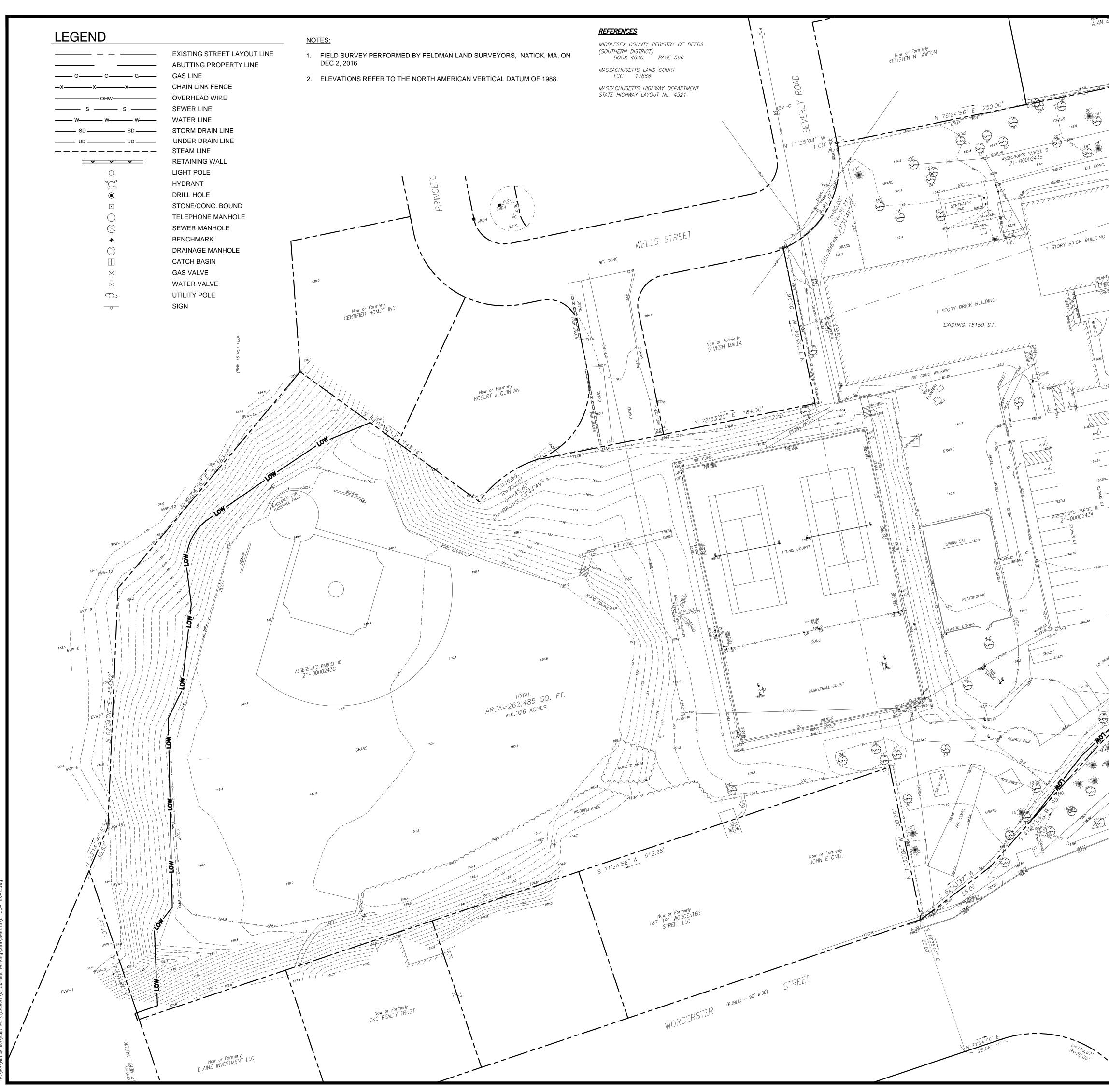
11. RESTORE ALL DISTURBED AREAS AND LIMITS OF ALL REMOVALS TO LOAM AND SEED (L&S) UNLESS OTHERWISE NOTED.

12. SEE EARTHWORK SECTION OF SPECIFICATIONS FOR SPECIFIC EXCAVATION AND FILLING

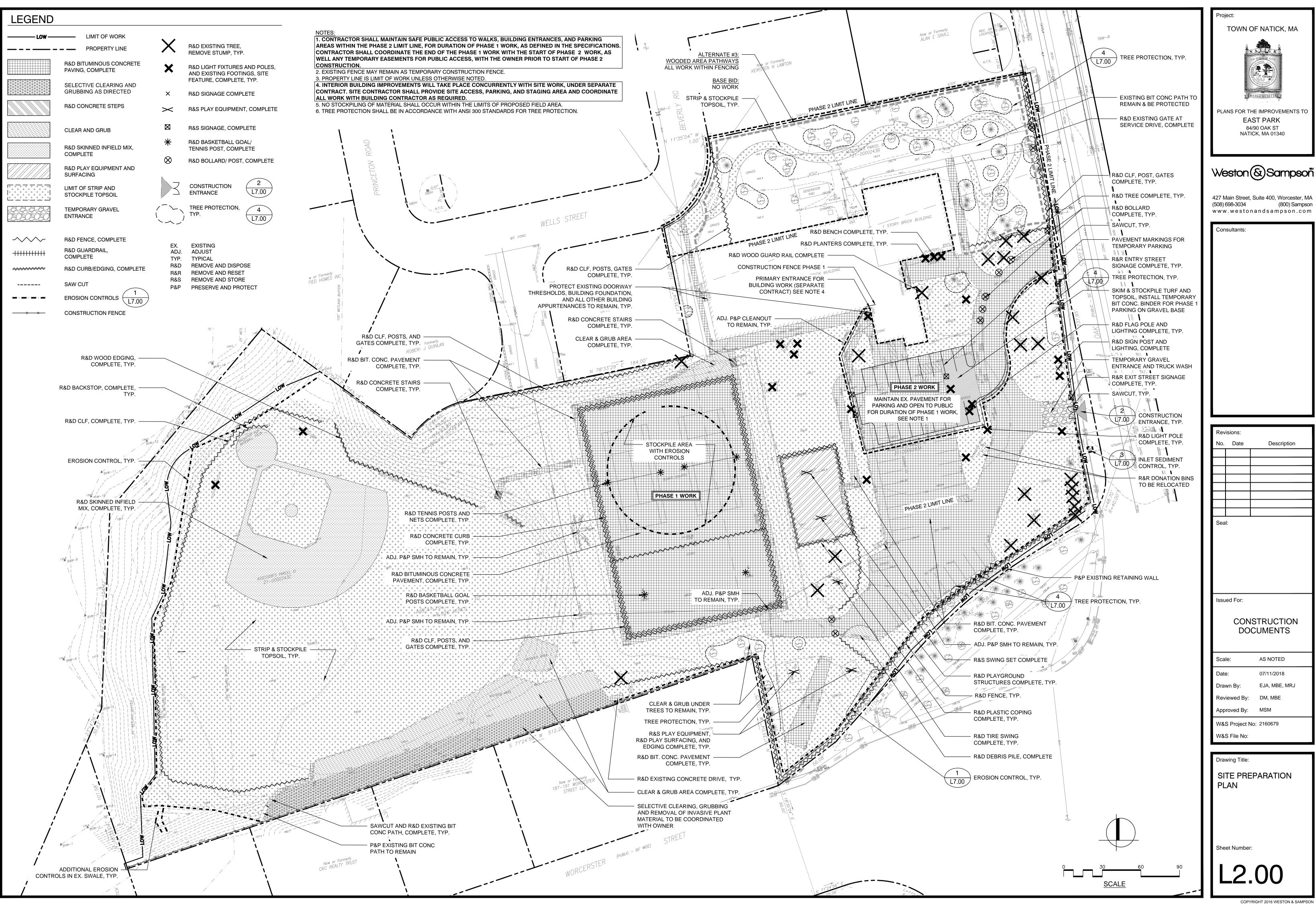
# LAYOUT & MATERIALS NOTES

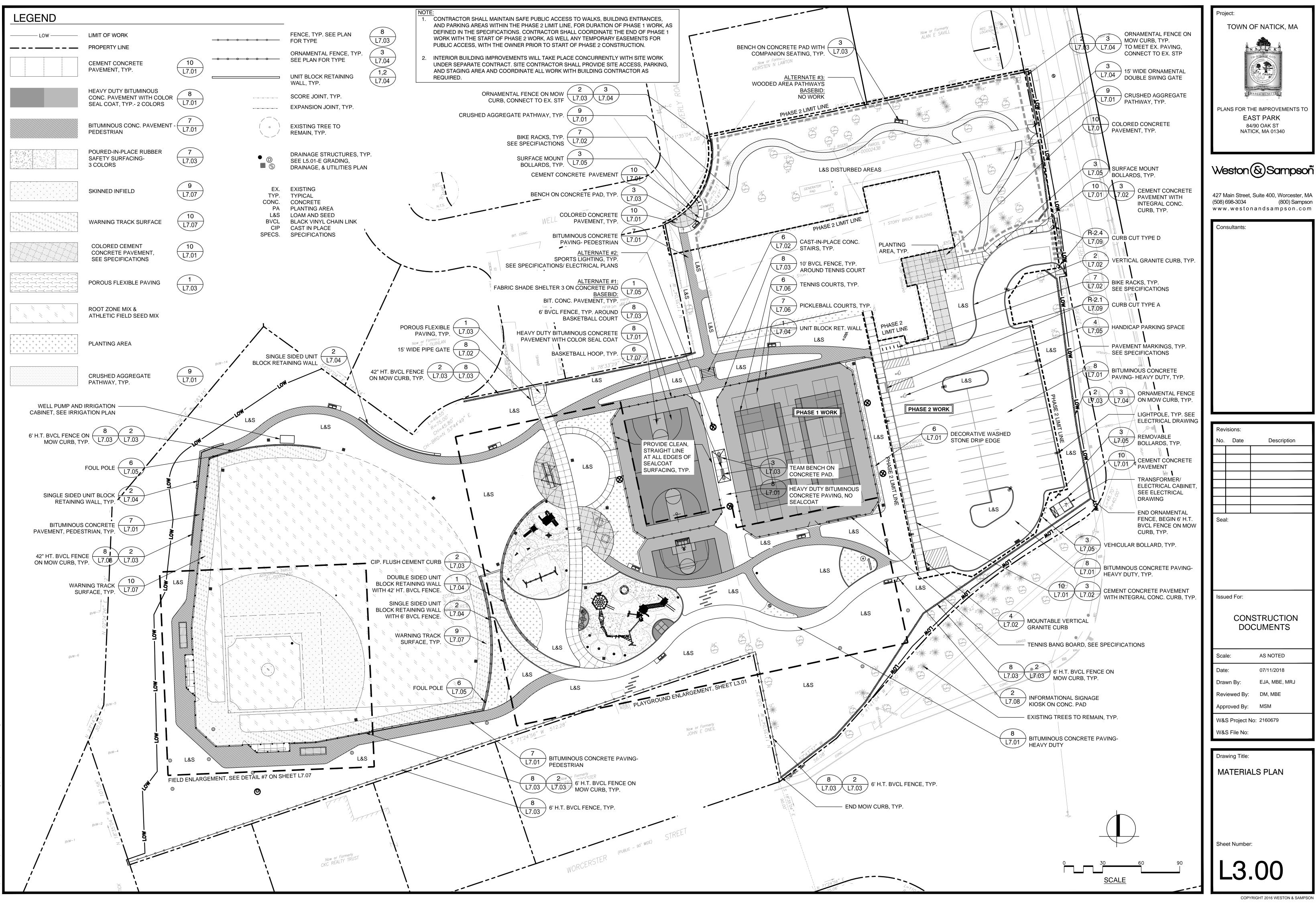
- 1. COORDINATE ALL LAYOUT ACTIVITIES WITH THE SCOPE OF WORK CALLED FOR BY DEMOLITION, GRADING AND UTILITIES OPERATIONS ENCOMPASSED BY THIS CONTRACT SET, PROTECT AND REPLACE REFERENCE STAKES AS NECESSARY OR AS REQUIRED BY THE OWNER'S REPRESENTATIVE.
- 2. ALL WORK SHALL BE PERFORMED BY CONTRACTOR UNLESS SPECIFICALLY INDICATED THAT THE WORK WILL BE PERFORMED "BY OWNER".
- 3. THE LAYOUT OF ALL NEW PATHWAYS / WALKWAYS AND THE GRADING OF ALL SLOPES AND CROSS SLOPES SHALL CONFORM TO THE COMMONWEALTH OF MASSACHUSETTS RULES AND REGULATIONS FOR HANDICAP ACCESS CMR 521, AND THE AMERICANS WITH DISABILITIES ACT (ADA), TITLE 3. THE CONTRACTOR SHALL NOTIFY THE OWNER IMMEDIATELY OF ANY DISCREPANCIES BETWEEN ACTUAL CONDITIONS AND THOSE REQUIRED.
- 4. ALL LAYOUT LINES, OFFSETS, OR REFERENCES TO LOCATING OBJECTS ARE EITHER PARALLEL OR PERPENDICULAR UNLESS OTHERWISE DESIGNATED WITH ANGLE OFFSETS NOTED.
- 5. ALL PROPOSED SITE FEATURES SHALL BE LAID OUT AND STAKED FOR REVIEW AND APPROVAL BY THE OWNER'S REPRESENTATIVE PRIOR TO COMMENCEMENT OF INSTALLATION. ANY REQUIRED ADJUSTMENTS TO THE LAYOUT SHALL BE UNDERTAKEN AS DIRECTED, AT NO ADDITIONAL COST TO THE OWNER.
- 6. ALL PROPOSED PAVEMENTS SHALL MEET THE LINE AND GRADE OF EXISTING ADJACENT PAVEMENT SURFACES AND SHALL BE TREATED WITH AN RS-1 TACK COAT OR EQUAL AT POINT OF CONNECTION. ALL PATHWAY WIDTHS SHALL BE AS NOTED ON THE LAYOUT AND MATERIALS PLAN.
- 7. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND GRADES ON THE GROUND AND REPORT ANY DISCREPANCIES IMMEDIATELY TO THE OWNER.
- 8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR FIELD MEASUREMENT OF ALL PROPOSED FENCES AND GATES.
- 9. THE DEPTH OF LOAM BORROW FOR ALL PROPOSED LAWN AREAS SHALL BE 6" MINIMUM. ALL DISTURBED AREAS SHALL BE RESTORED WITH LOAM AND SEED UNLESS OTHERWISE NOTED.
- 10. ALL REFERENCES TO LOAM AND SEED (L&S) REFER TO HYDROMULCH SEEDED LAWN.
- 11. ALL PLAY EQUIPMENT, SHALL BE INSTALLED BY CONTRACTOR. CONTRACTOR SHALL HAVE THE MANUFACTURER'S CERTIFIED PLAYGROUND SAFETY INSPECTOR (CPSI) REVIEW NEW PLAY EQUIPMENT AND REPORT ANY FLAWS OR DAMAGES PRIOR TO ITS INSTALLATION. OWNER WILL NOT ACCEPT AND PAY FOR THE PROJECT UNTIL IT IS APPROVED BY A CPSI.
- 17. REFER TO SPECS AND MANUFACTURER'S GUIDELINES FOR THE ASSEMBLY AND INSTALLATION OF PLAY EQUIPMENT. NOTIFY 48 HOURS IN ADVANCE (MIN.) FOR LAYOUT INSPECTION. CONTRACTOR SHALL NOT MOVE FORWARD WITHOUT OWNER'S REPRESENTATIVE APPROVAL OF PLAYGROUND AND CURBING LAYOUT.
- 18. MAINTAIN SAFETY OR PAVING ZONES AROUND ALL EQUIPMENT PER MANUFACTURER'S LAYOUT DRAWINGS. ADJUST CURBING AS NECESSARY TO MEET THESE REQUIREMENTS. PLANS AND SPECIFICATIONS. EQUIPMENT LAYOUT AND ASSEMBLY MUST BE INSPECTED BY THE MANUFACTURER'S CERTIFIED PLAYGROUND SAFETY INSPECTOR PRIOR TO THE CLOSEOUT OF THE JOB.
- 19. PLAY EQUIPMENT SHOWN HERE IS PER MANUFACTURER, SEE SPECS FOR OTHER APPROVED MANUFACTURERS.
- 20. FOR ALL POURED IN PLACE RESILIENT RUBBER SURFACING AREAS, THE CONTRACTOR MUST DETERMINE THE APPROPRIATE THICKNESS OF SAFETY SURFACING (BASED ON MANUFACTURER'S SPECIFICATIONS AND SAFETY REQUIREMENTS)

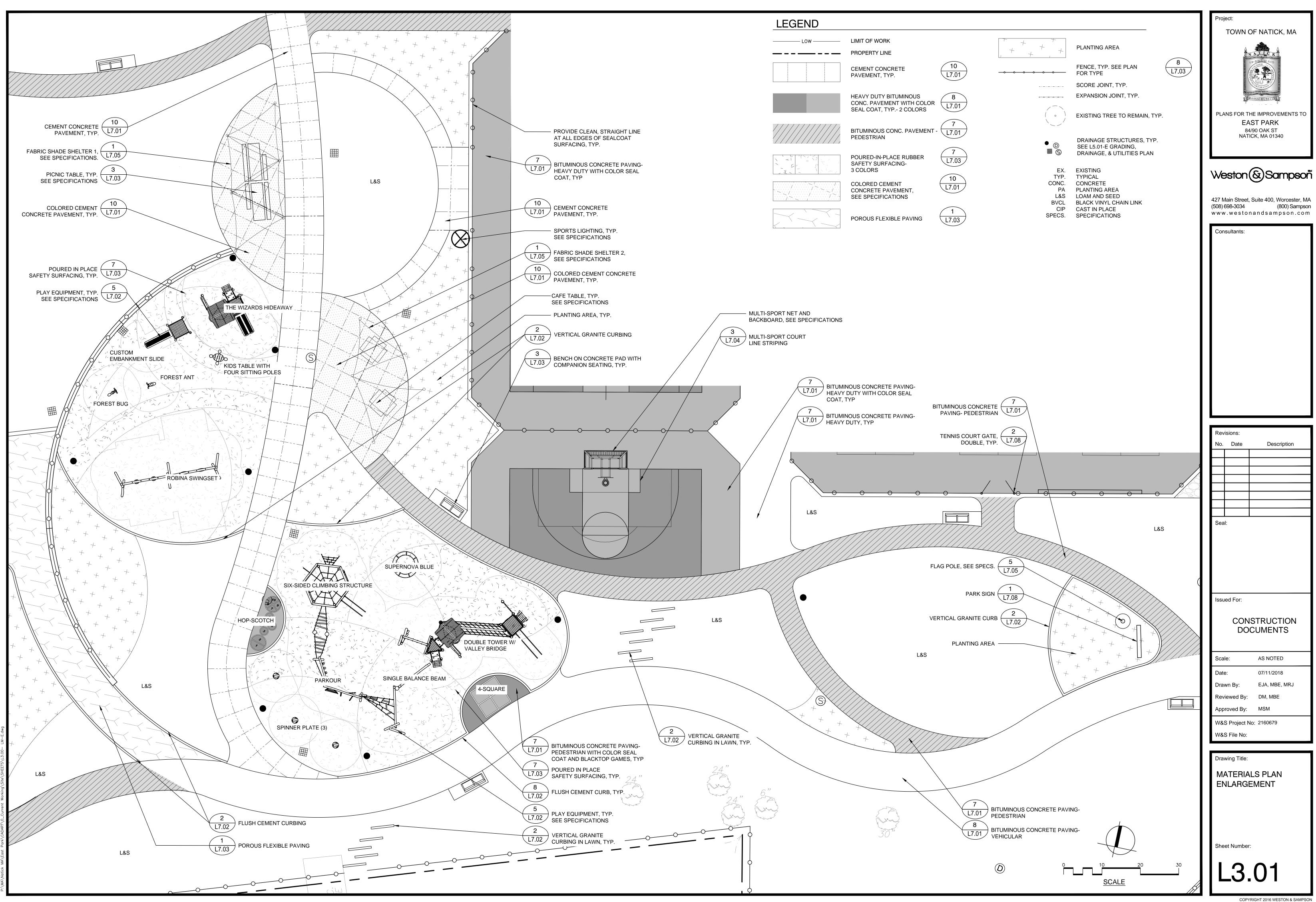
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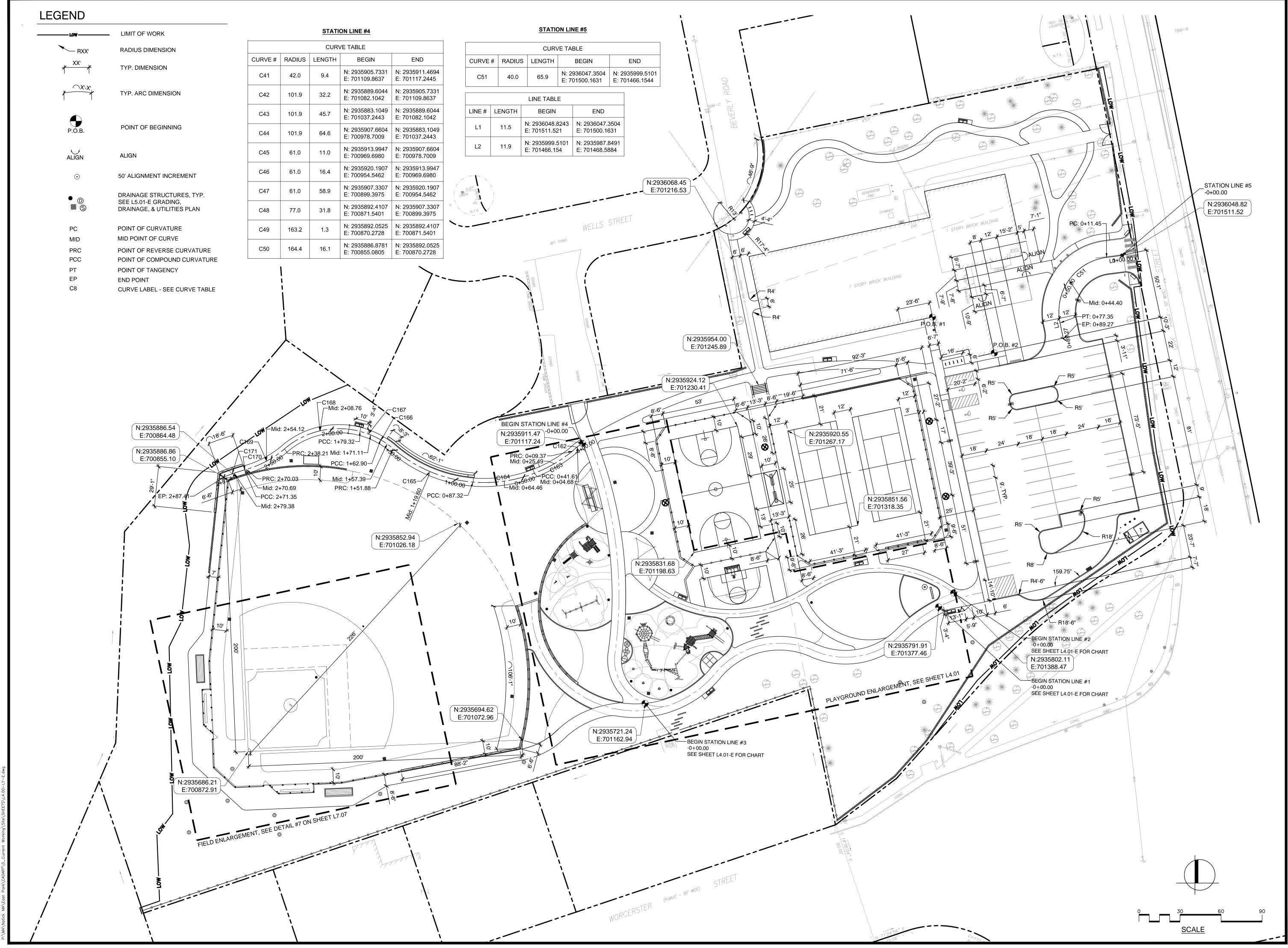


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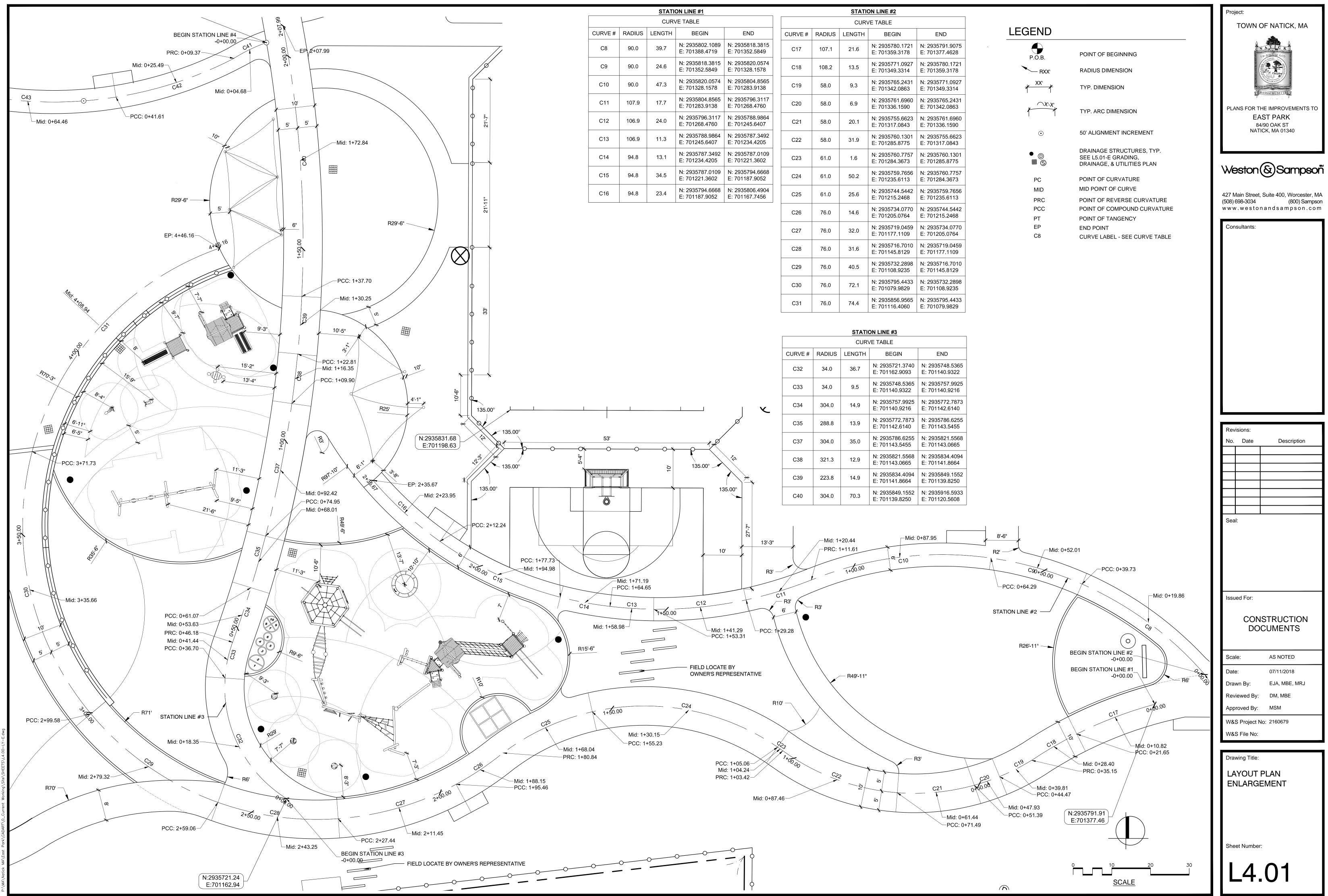


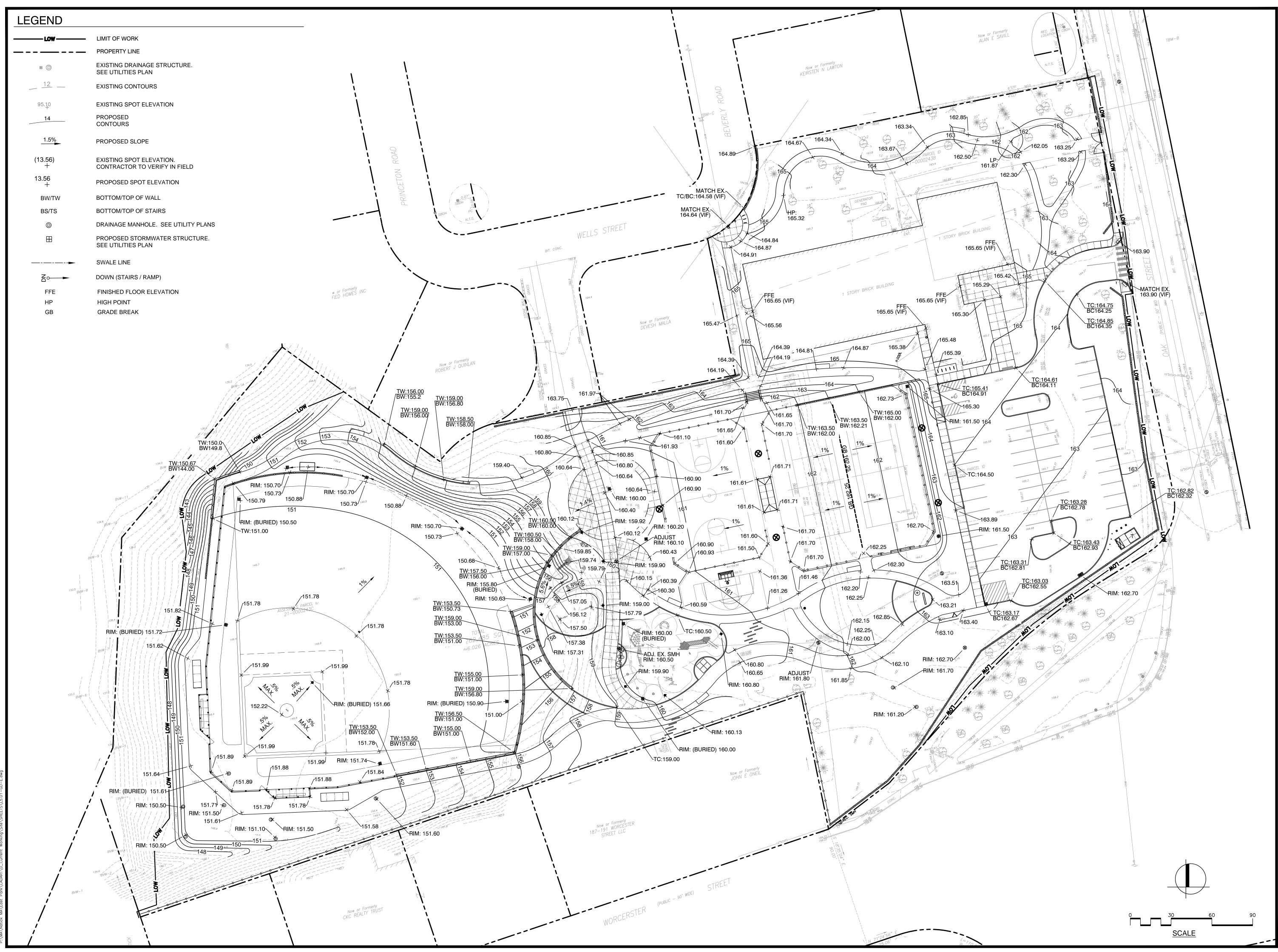




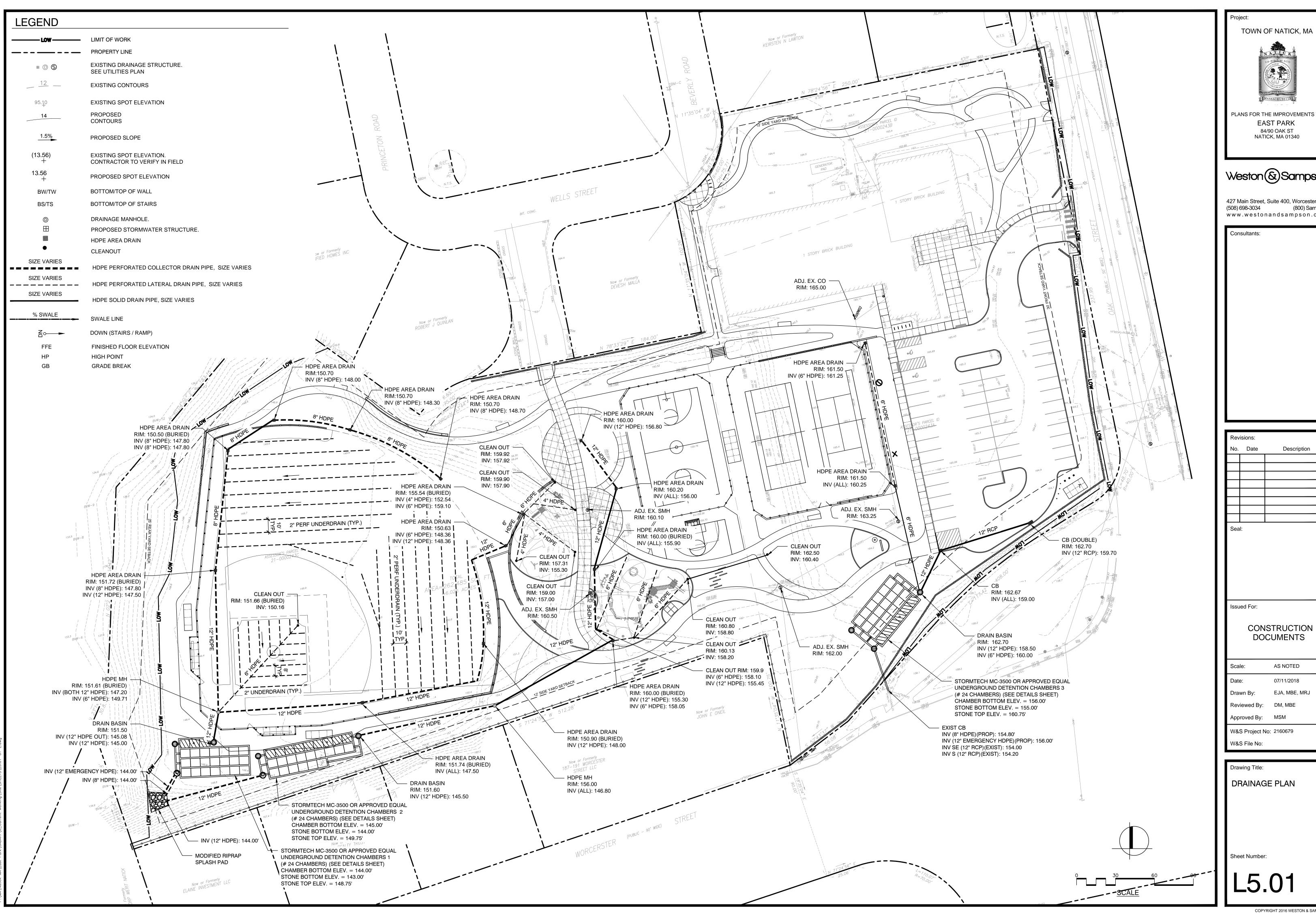


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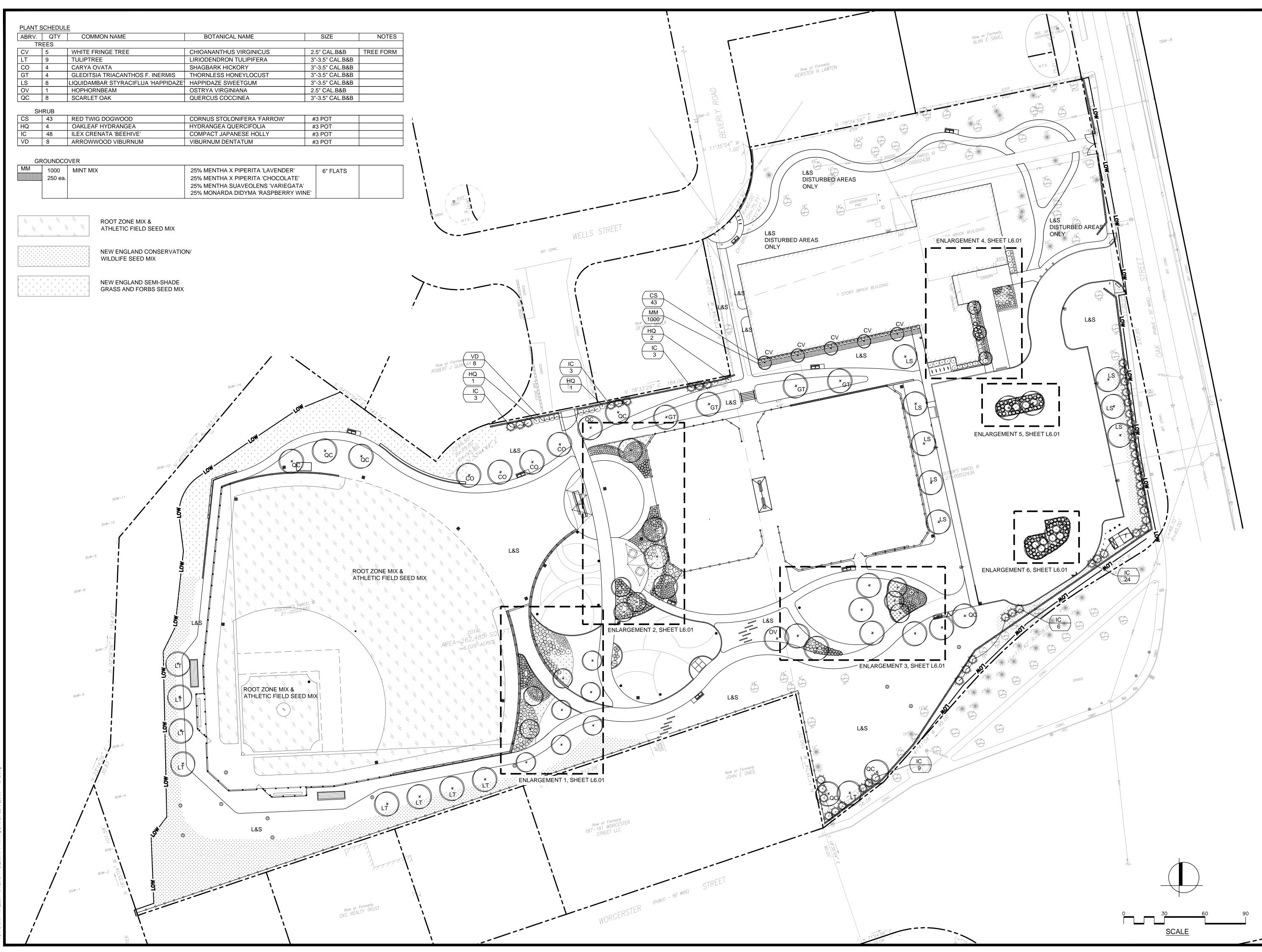




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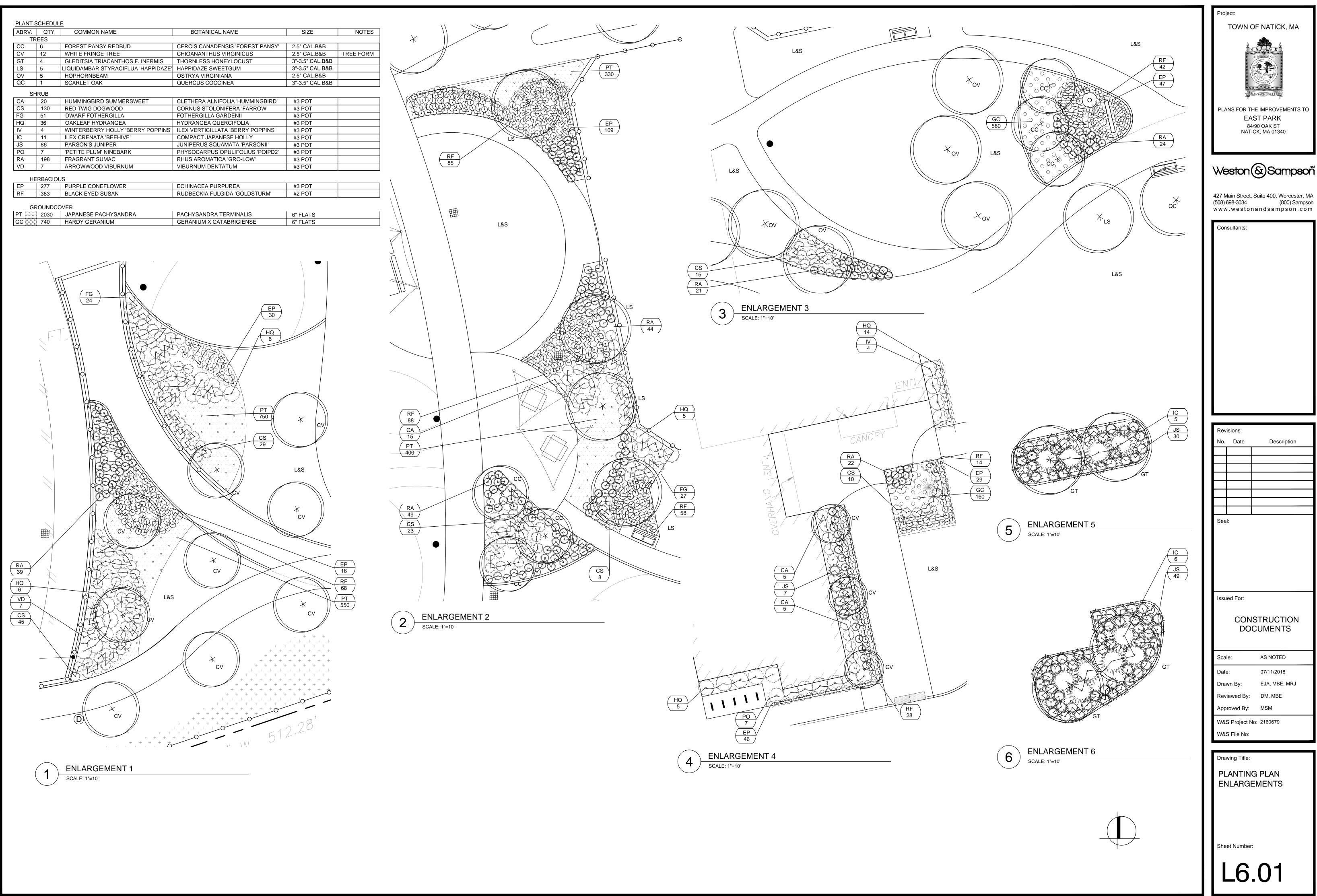


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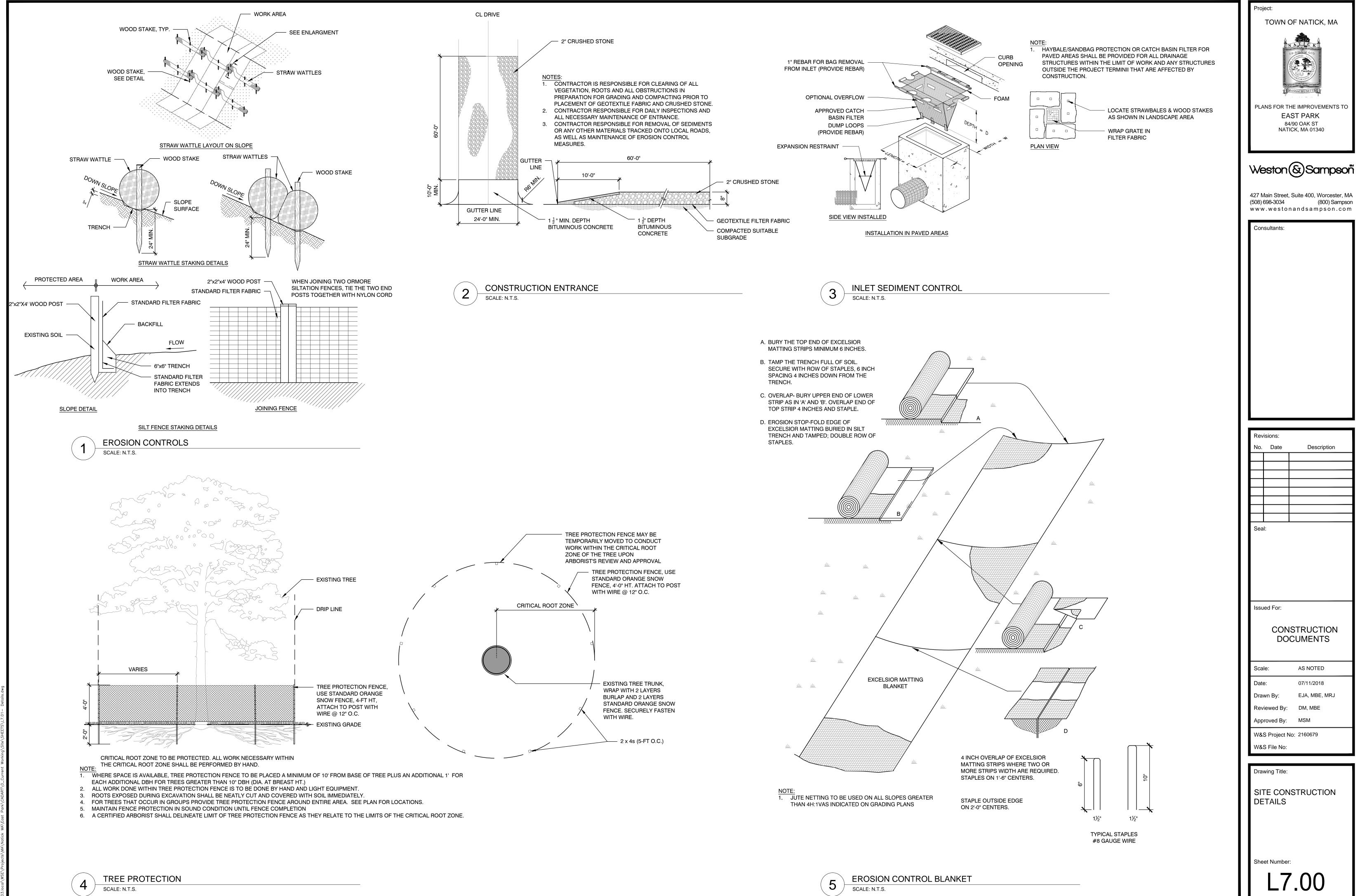
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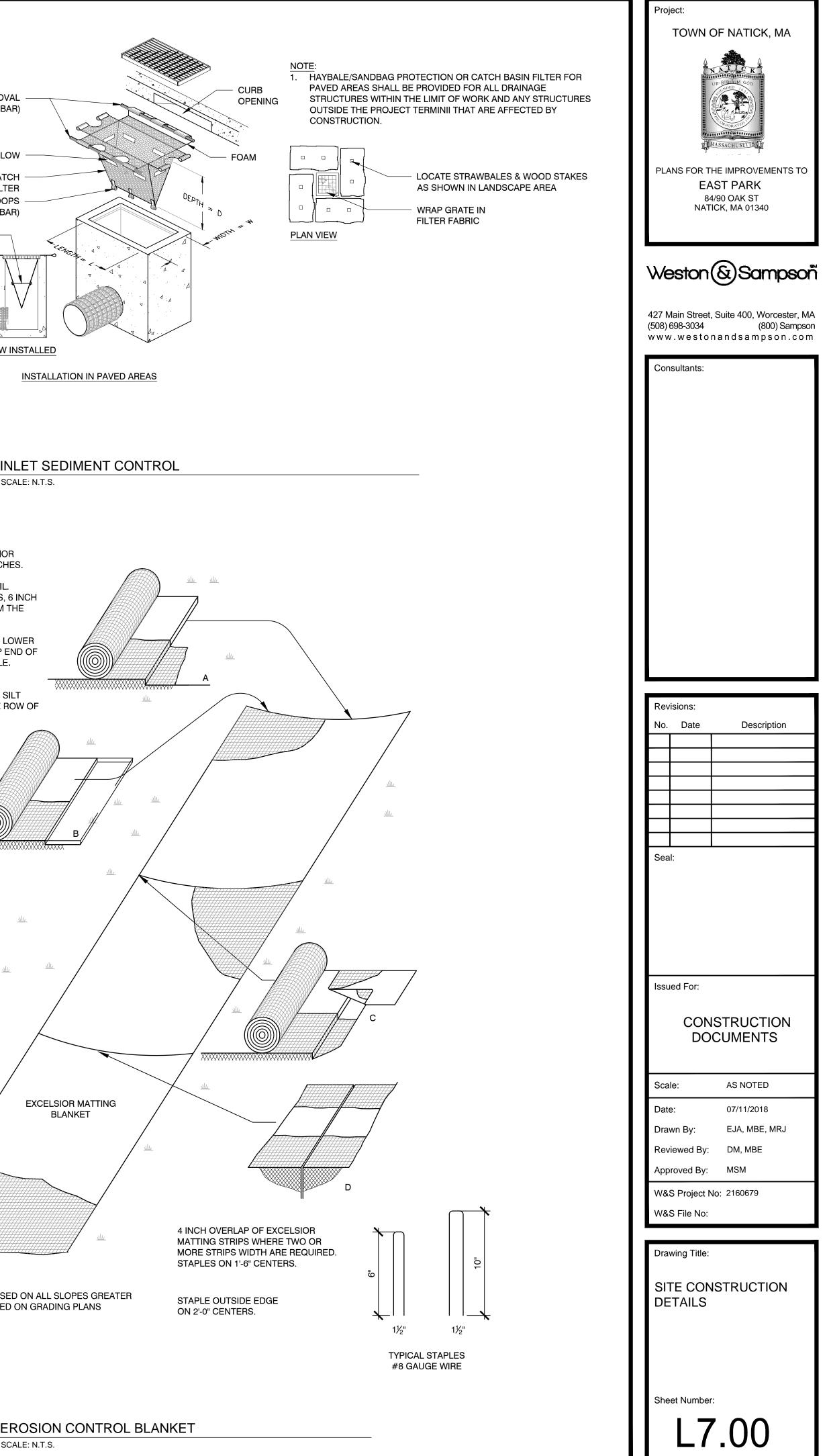
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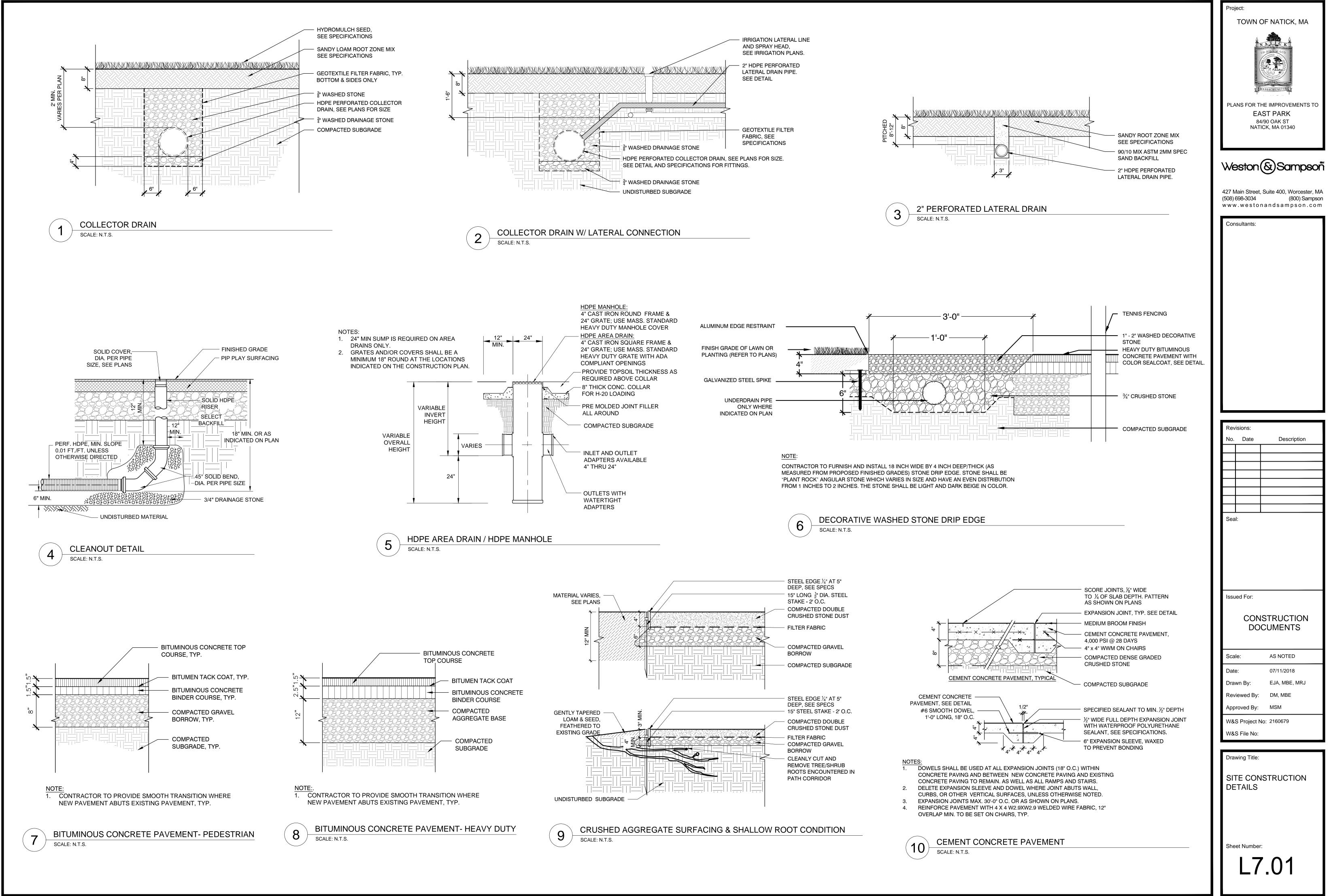


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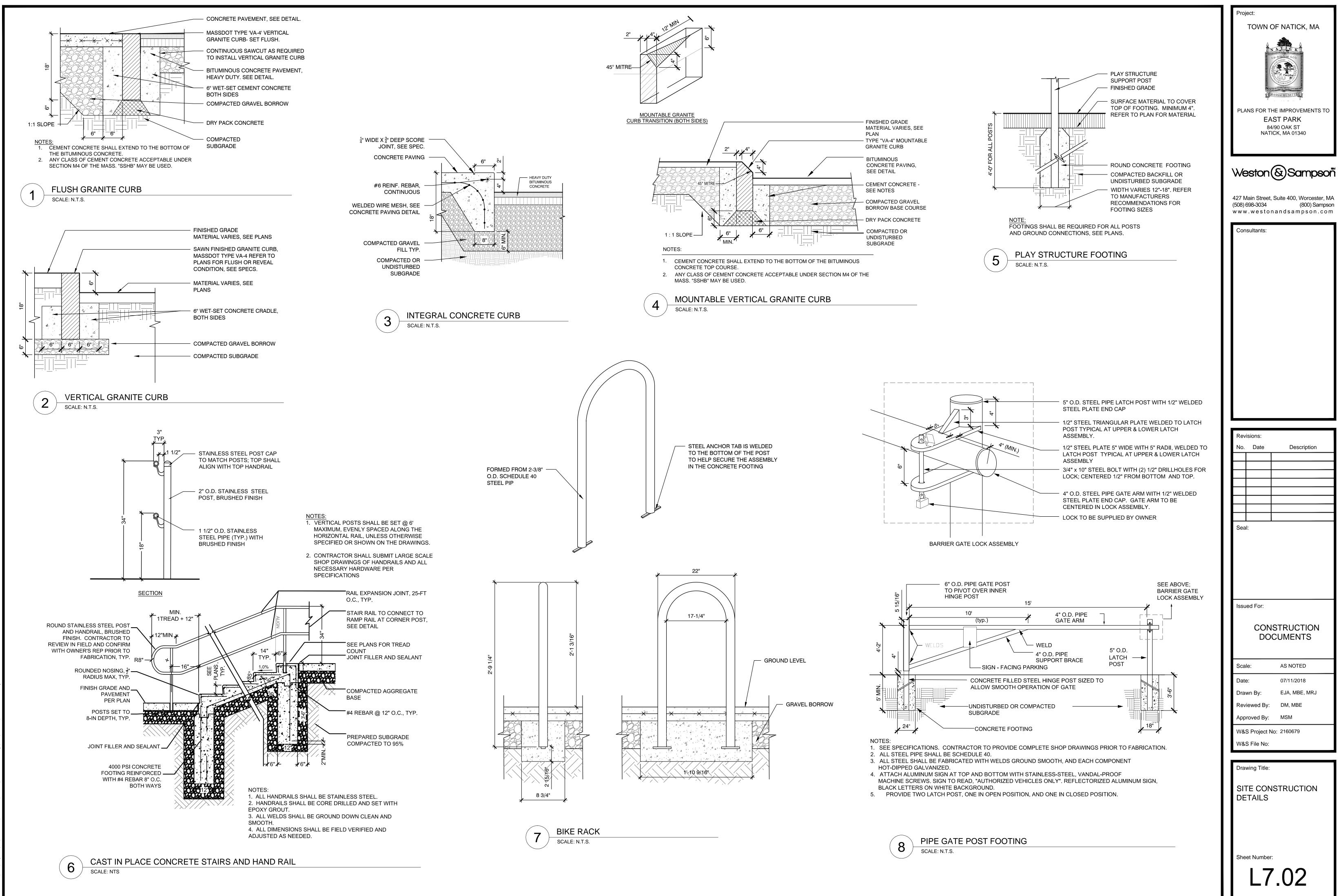
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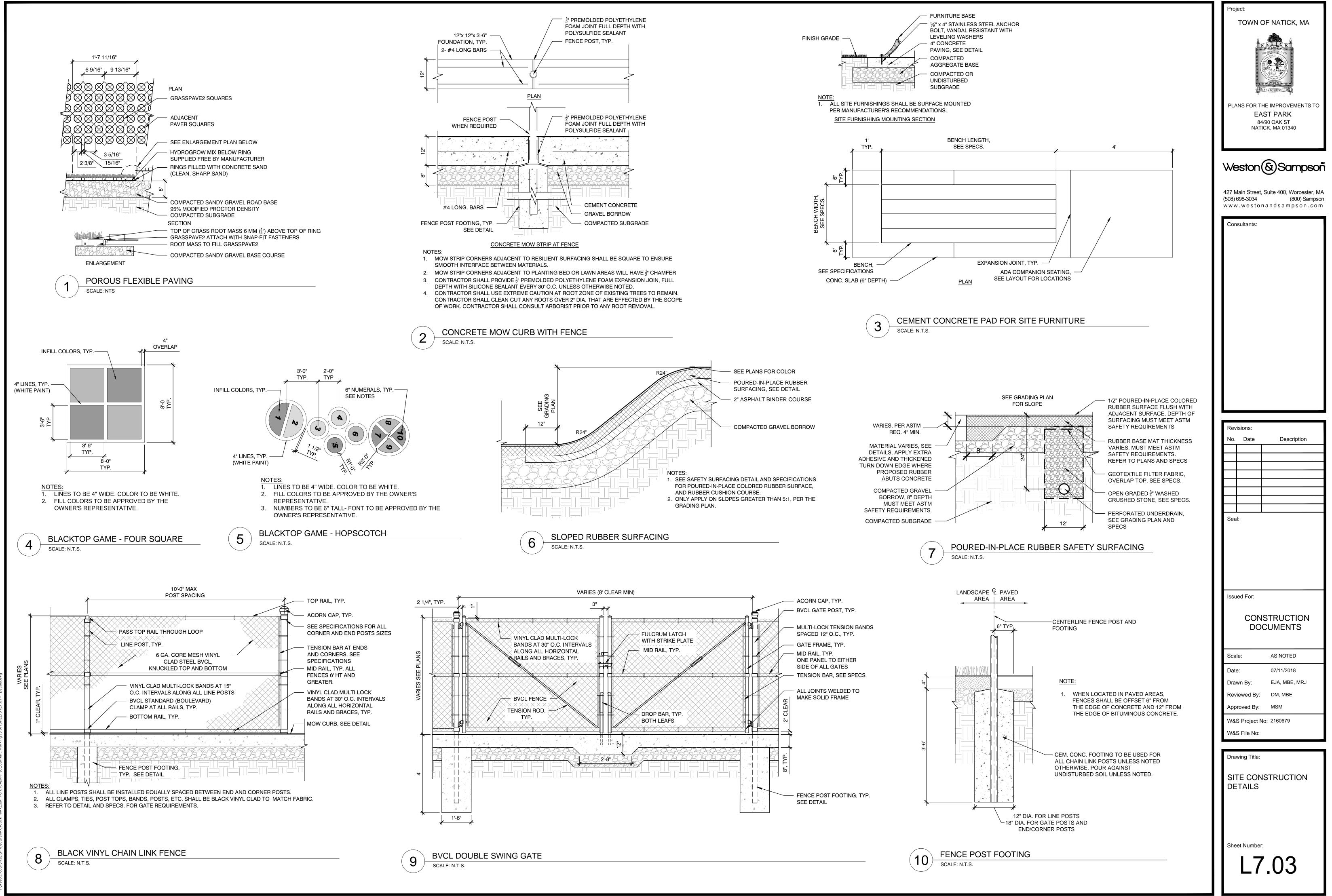


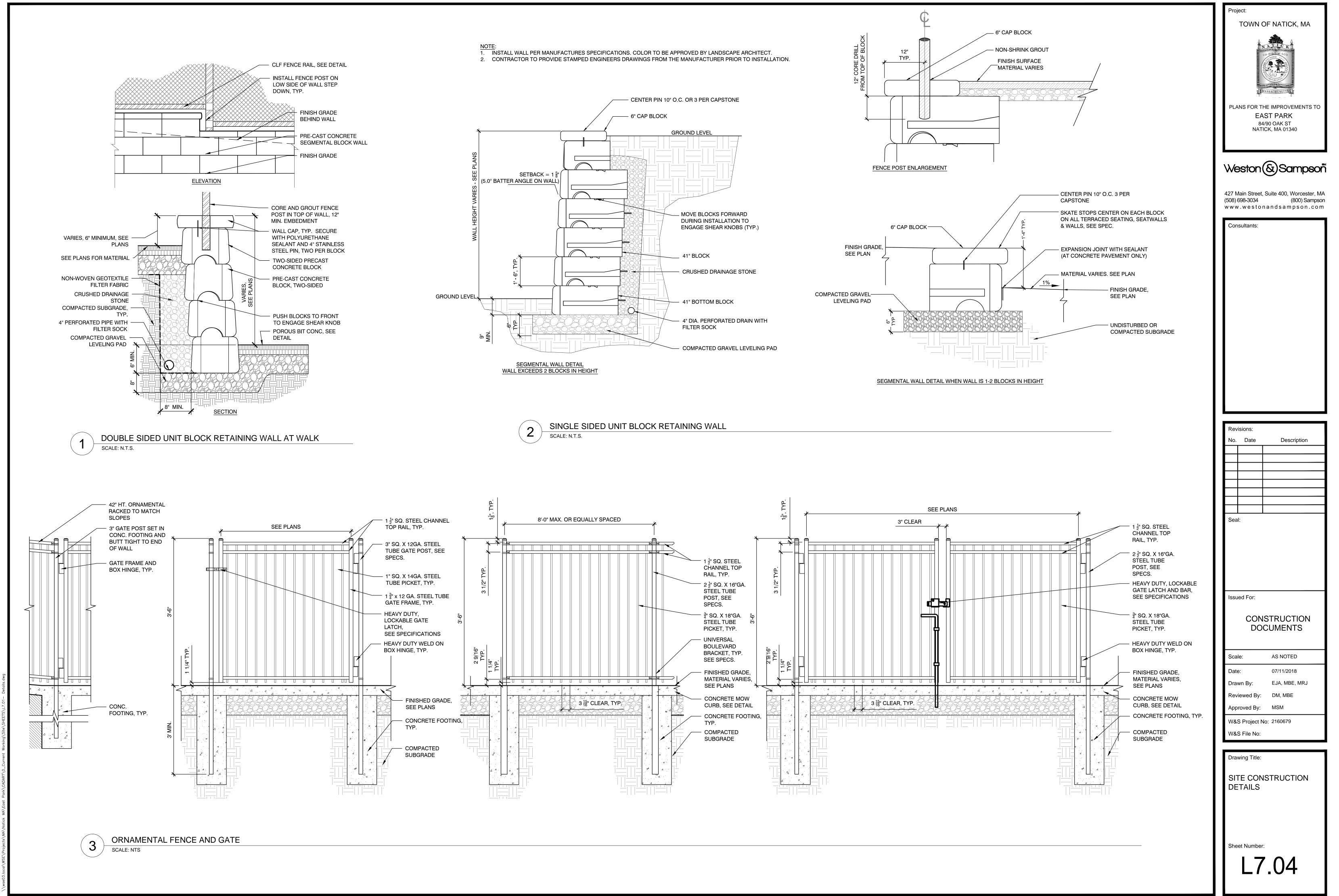


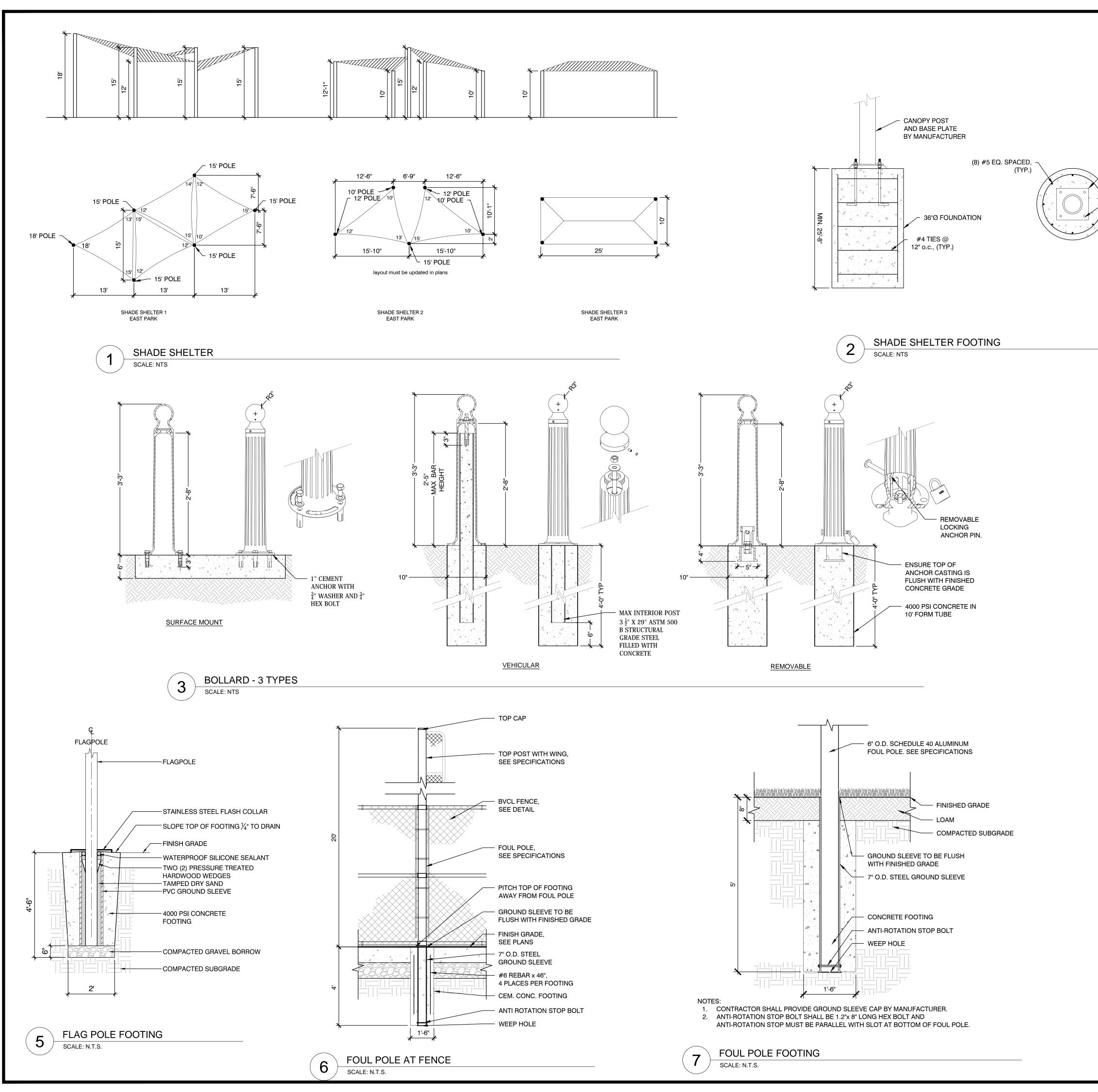
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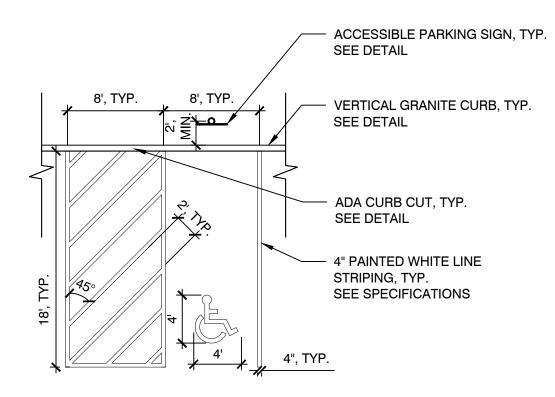




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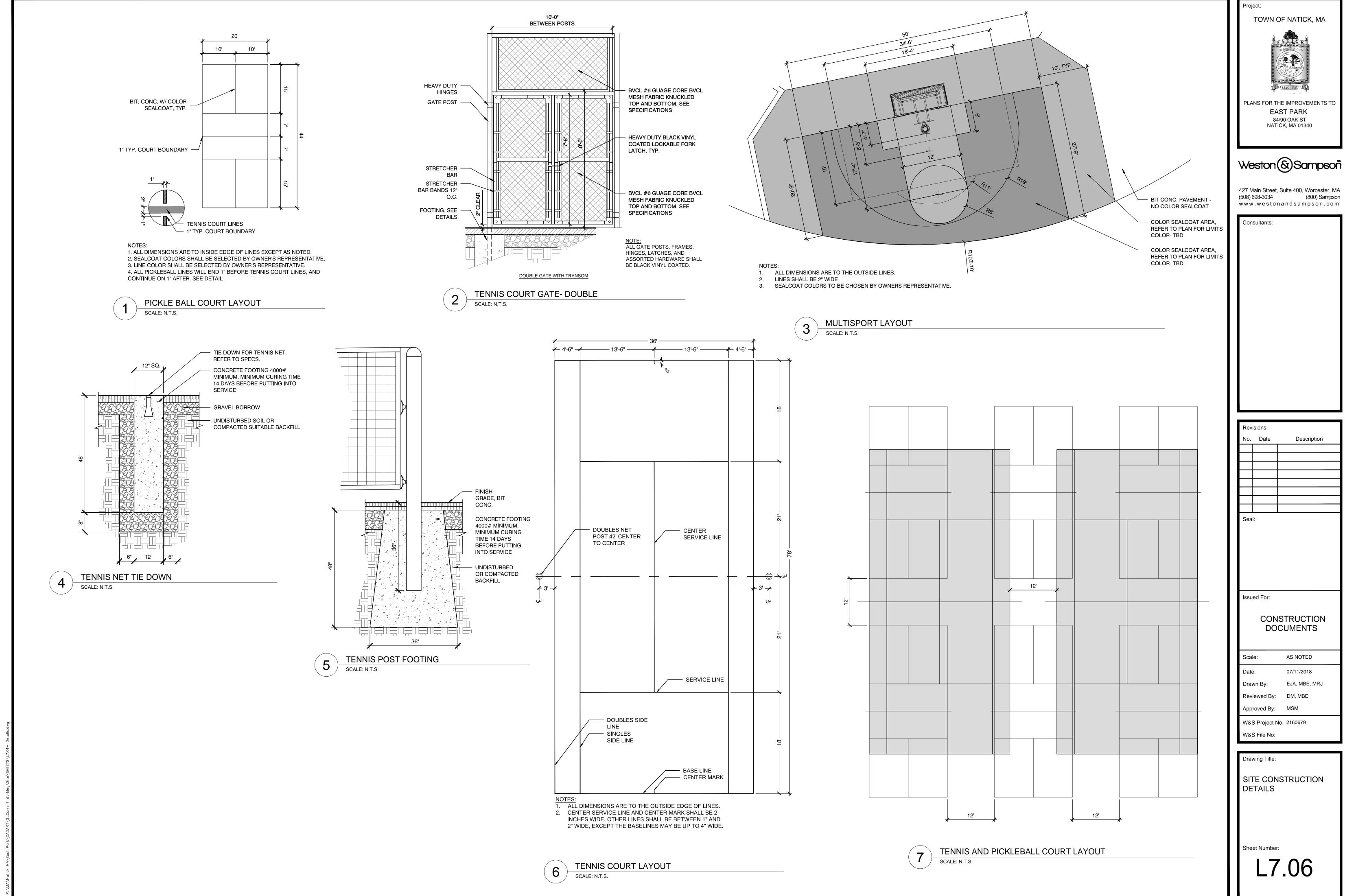
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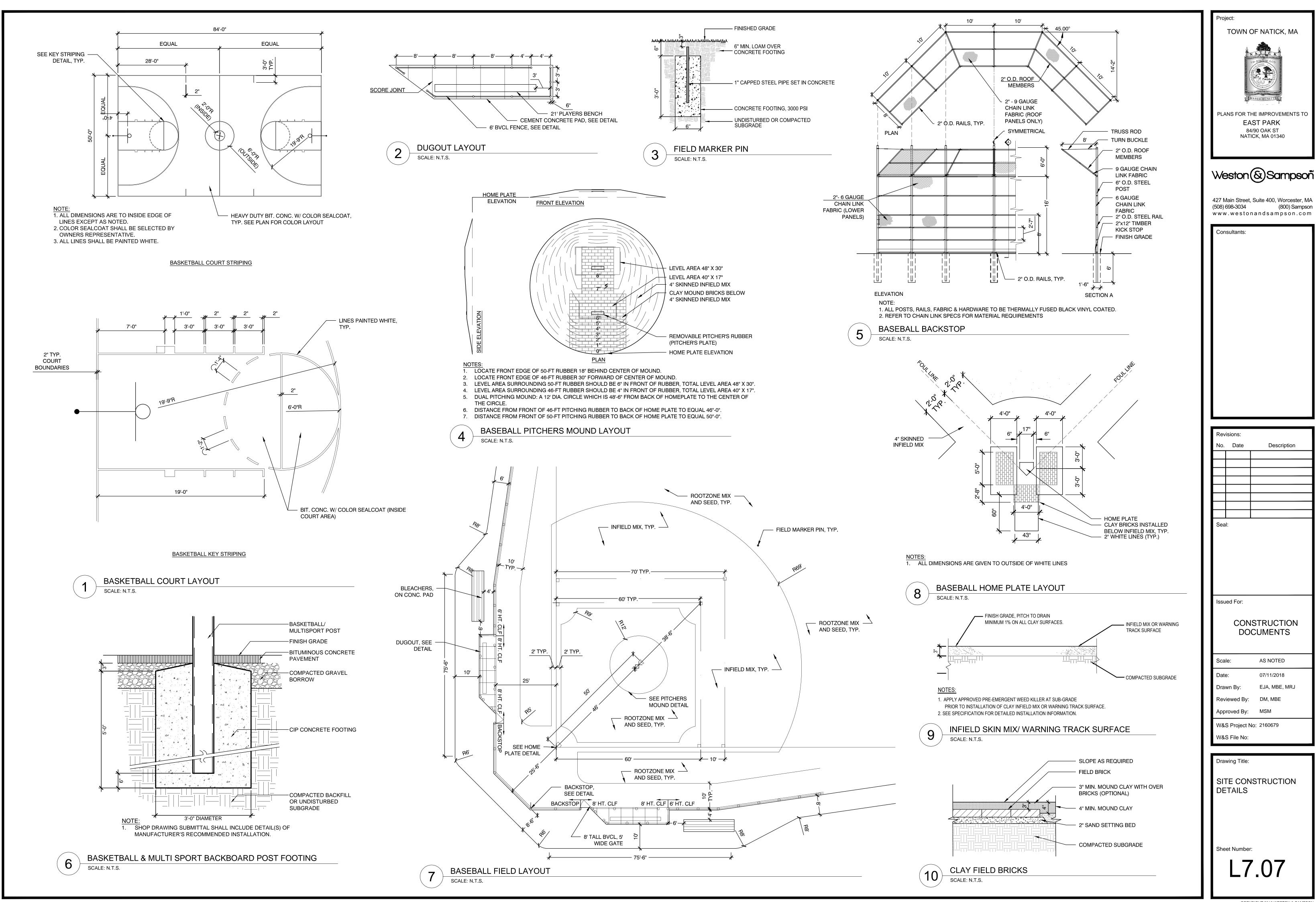
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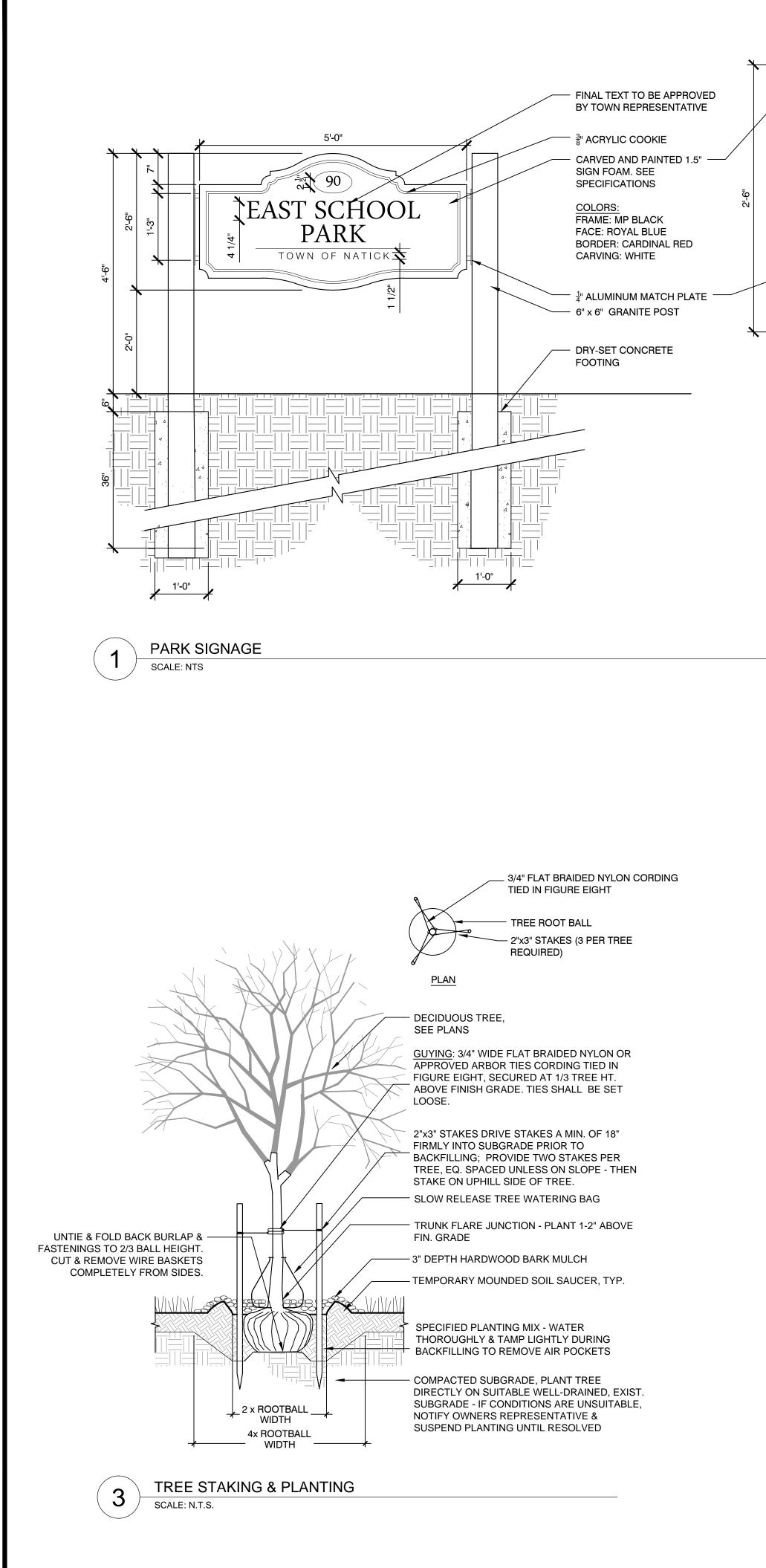
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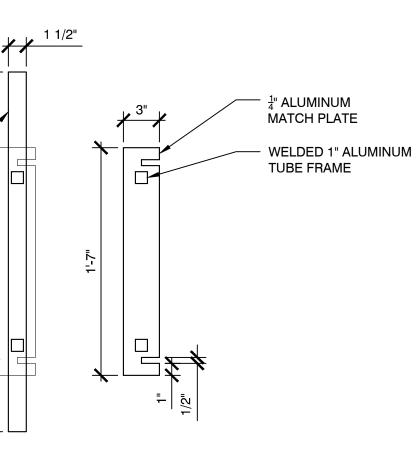
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Issued For: CONSTRUCTION DOCUMENTS Scale: AS NOTED Date: 07/11/2018 Drawn By: EJA, MBE, MRJ Reviewed By: DM, MBE Approved By: MSM W&S Project No: 2160679 W&S File No: Drawing Title: SITE CONSTRUCTION DETAILS			
Issued For: CONSTRUCTION DOCUMENTS Scale: AS NOTED Date: 07/11/2018 Drawn By: EJA, MBE, MRJ Reviewed By: DM, MBE Approved By: MSM W&S Project No: 2160679 W&S File No: Drawing Title: SITE CONSTRUCTION DETAILS			



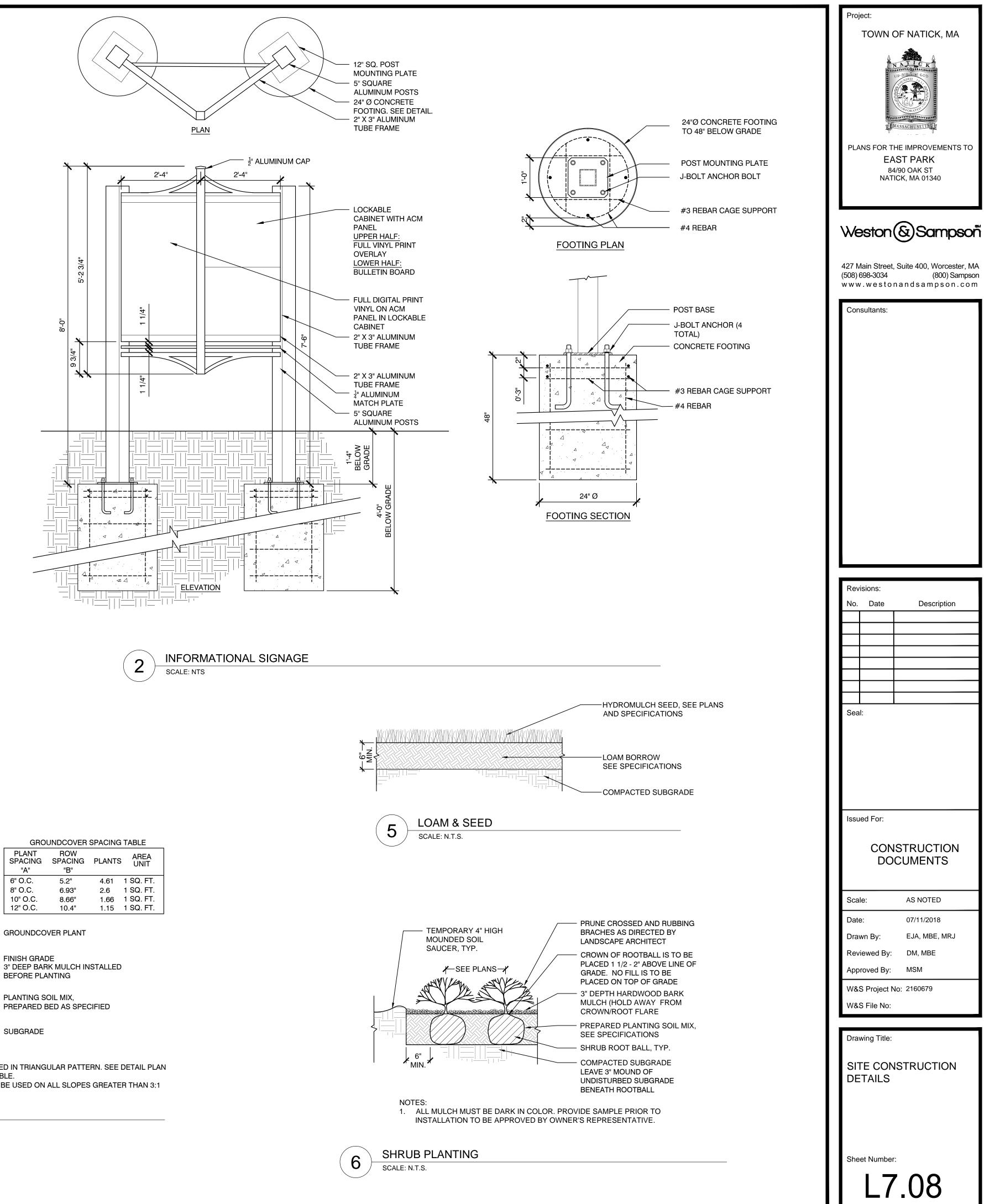




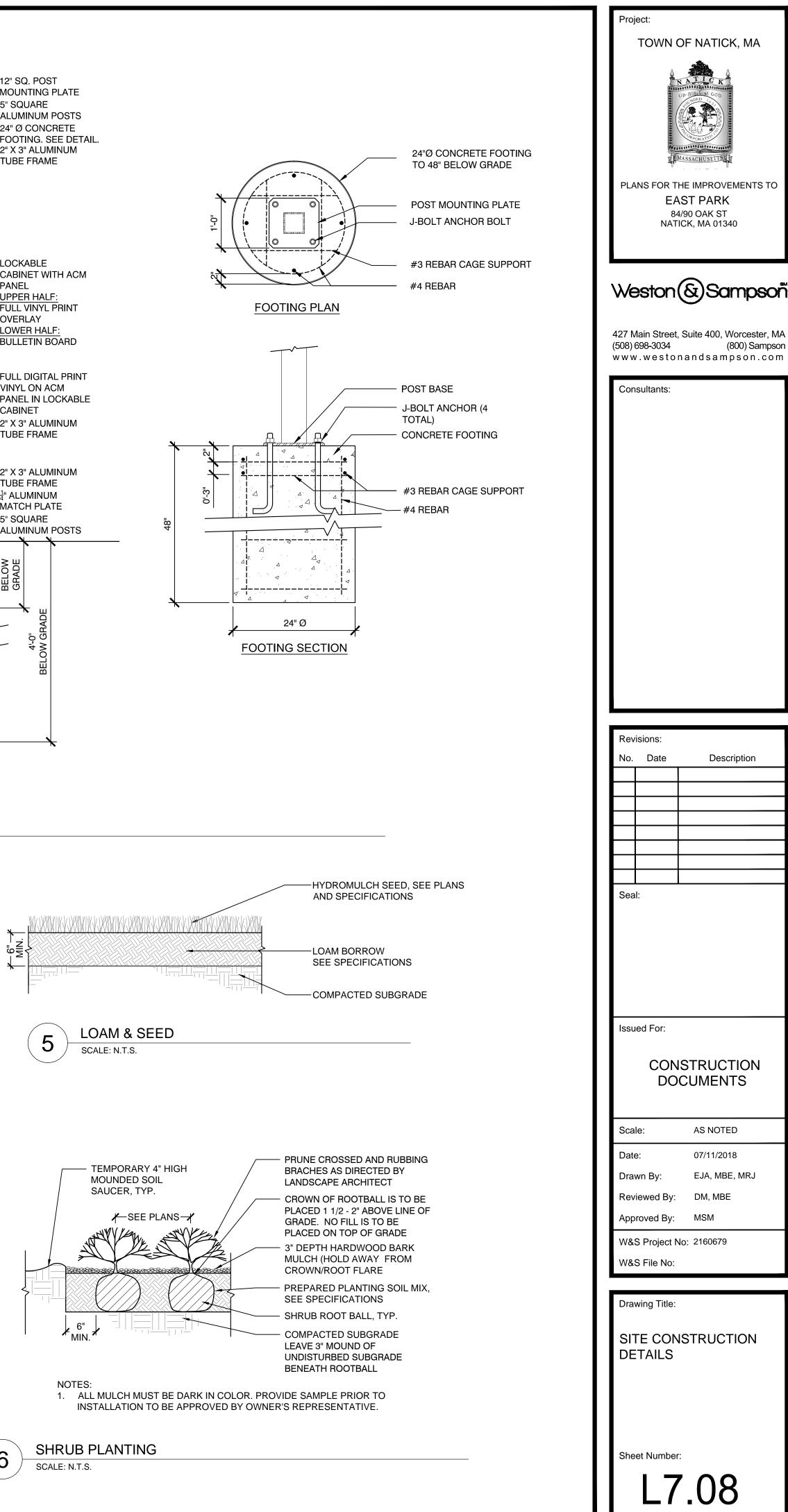


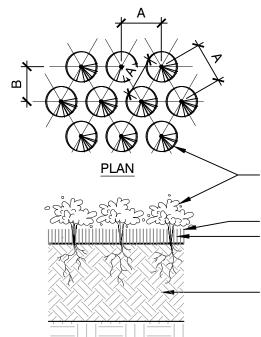


MATCH PLATE DETAIL









SECTION

GROUNDCOVER SPACING TABLE

SPACING "A"	SPACING "B"	PLANTS	UNIT
6" O.C.	5.2"	4.61	1 SQ. FT.
8" O.C.	6.93"	2.6	1 SQ. FT.
10" O.C.	8.66"	1.66	1 SQ. FT.
12" O.C.	10.4"	1.15	1 SQ. FT.

- GROUNDCOVER PLANT

– FINISH GRADE - 3" DEEP BARK MULCH INSTALLED BEFORE PLANTING

- PLANTING SOIL MIX, PREPARED BED AS SPECIFIED

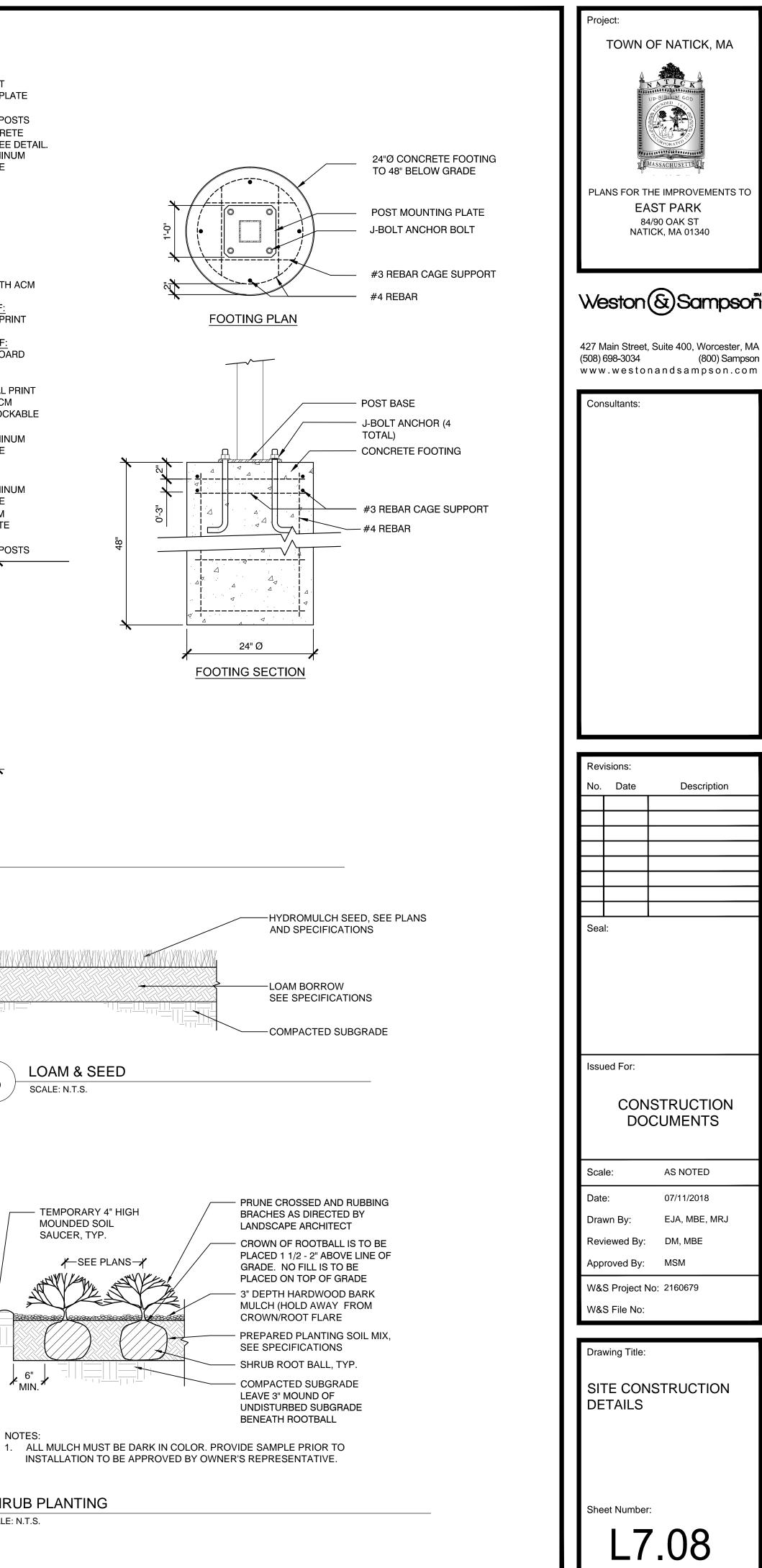
SUBGRADE

NOTES: 1. ALL GROUNDCOVER TO BE PLANTED IN TRIANGULAR PATTERN. SEE DETAIL PLAN AND GROUNDCOVER SPACING TABLE.

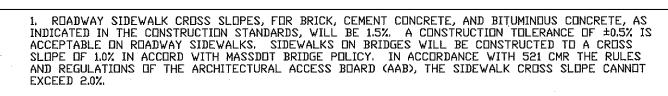
2. JUTE EROSION CONTROL MAT TO BE USED ON ALL SLOPES GREATER THAN 3:1



GROUNDCOVER PLANTING SCALE: N.T.S.







AN UNDBSTRUCTED PATH OF TRAVEL WITH A MINIMUM WIDTH OF 3'-3' (PREFERED MINIMUM WIDTH OF 5'-0' FOR SIDEWALK MAINTENANCE) SHALL BE MAINTAINED PAST ALL DBSTRUCTIONS (UTILITY POLES, SIGNS, SIGNAL FOUNDATIONS, MASTS, MAILBOXES, ALONG DRIVE OPENINGS, ETC.>.

3. THE WHEELCHAIR RAMP SLOPES AND SIDE SLOPES (TRANSITIONS) WILL BE MAXIMUM OF 7.5% WITH A CONSTRUCTION TOLERANCE OF ±0.5%. HOWEVER THESE SLOPES MAY BE FLATTER WHEN WARRANTED BY SURROUNDING CONDITIONS.

4. WHERE THE RUADWAY PROFILE EXCEEDS 4%, THE HIGH SIDE TRANSITION LENGTH UNDER ANY CUNDITIONS NEED NOT EXCEED 15'-0".

5. IN NO CASE WHERE A STOP LINE IS WARRANTED, SHALL A RAMP BE PLACED ON THE TRAFFIC APPROACH SIDE OF THAT STOP LINE,

6. FIXED DBJECTS (I.E. UTILITY POLES, HYDRANTS, SIGNS, SIGNAL FOUNDATIONS, ETC.) MUST NOT ENCROACH ON ANY PART OF THE WHEELCHAIR RAMP INCLUDING TRANSITION SLOPES, 7. AT NO TIME IS ANY PART OF THE WHEELCHAIR RAMP, EXCLUDING CURB TRANSITIONS TO BE

LICATED DUTSIDE THE CROSSWALK. THE WHEELCHAIR RAMP ENTRANCE IS TO BE CENTERED IN THE CRUSSWALK WHENEVER PUSSIBLE. 8. CATCH BASINS WHICH ARE TO BE LOCATED IN THE VICINITY OF A WHEELCHAIR RAMP SHALL BE LOCATED UPGRADE OF THE RAMP ENTRANCE.

9. THE ENTRANCE OF A WHEELCHAIR RAMP SHALL BE FLUSH WITH THE ROADWAY.

10. TESTING SURFACE: WHEN TESTING WITH A STRAIGHTEDGE PLACED PARALLEL TO THE LINE OF THE SLOPE THERE SHALL BE NO DEVIATION FROM A TRUE SURFACE IN EXCESS OF  $rac{1}{2}$  . 11. WHEELCHAIR RAMPS ON BRIDGES SHOULD BE AVOIDED. IF A WHEELCHAIR RAMP IS REQUIRED TO BE

PLACED ON A BRIDGE, PRIOR WRITTEN APPROVAL IS REQUIRED. SPECIAL DETAILING OF THE REINFORCEMENT AND CURB SYSTEM WILL BE REQUIRED TO MAINTAIN THE PREFORMANCE OF THE RAILING/BARRIER SYSTEM.

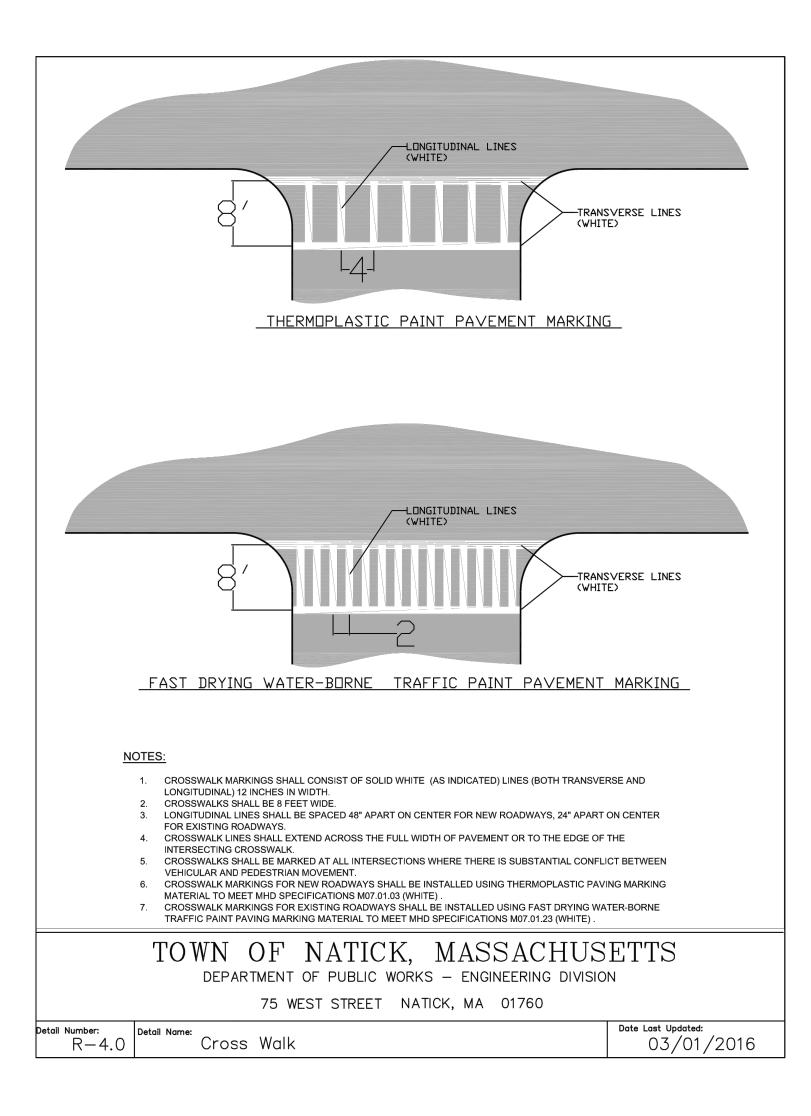
CURB	TRANSITION	LENGTH	FDR	WHEELCHAIR	
		RAMPS			

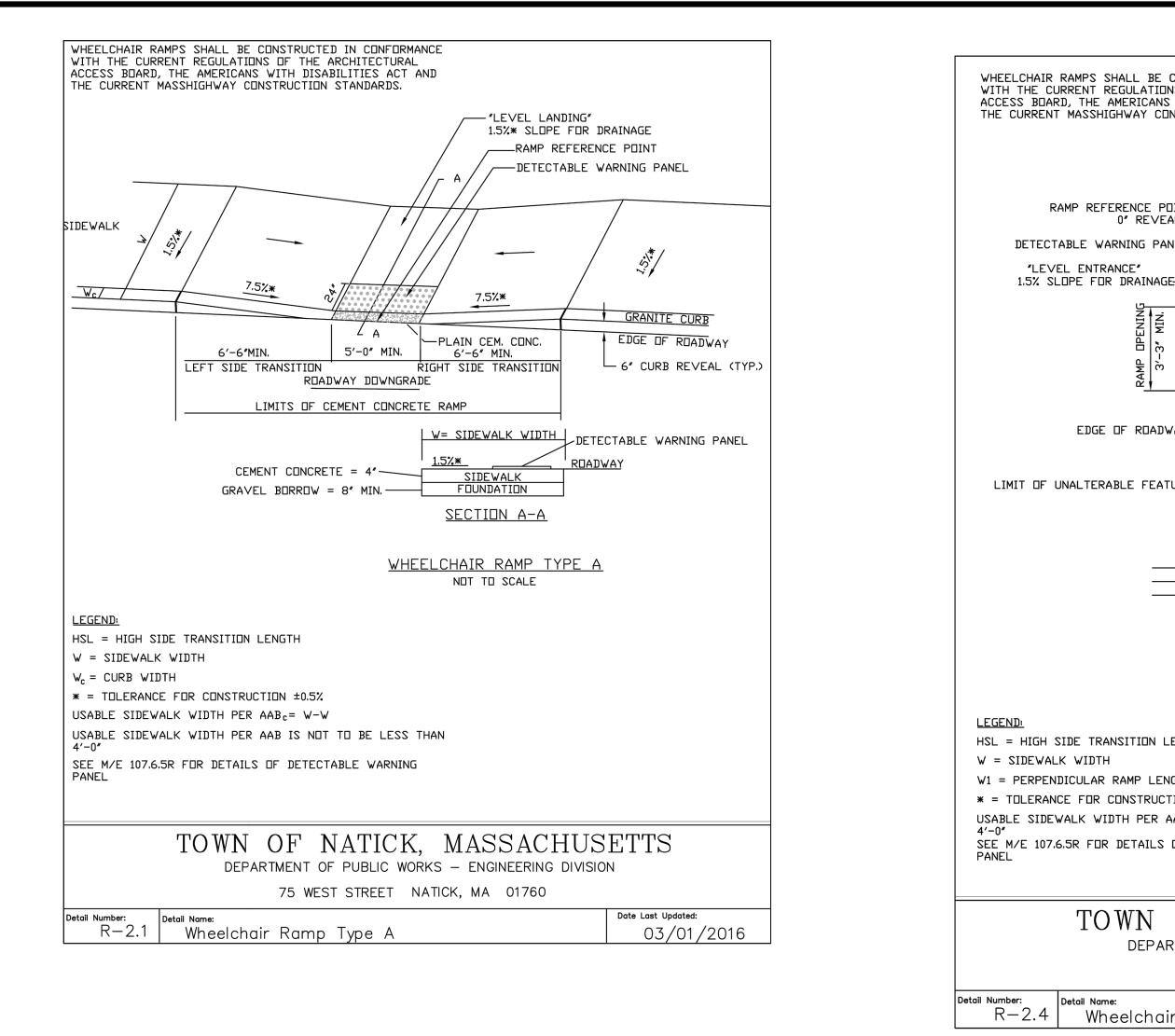
IX MI*	1 3
ROADWAY PROFILE GRADE	*HIGH SIDE TRANSITION LENGTH (HST)
%	
0	6'-6"
> 0 TO 1	7′-8″
> 1 TD 2	9'-0"
> 2 TO 3	11'-0"
> 3 TD 4	14'-0"
> 4	15'-0" MAX

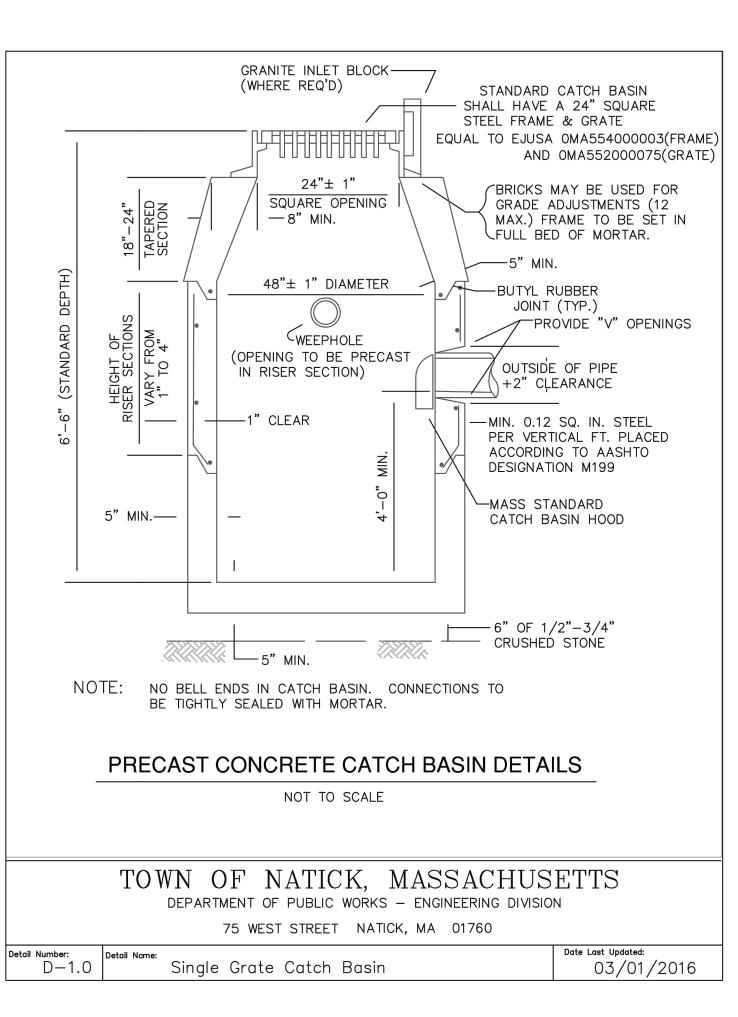
7 4 10 0 MHA \* BASED ON A DESIGN SLOPE OF 7.5% AND A CURB REVEAL OF 6". VARING CURB REVEAL MAY ALTER TRANSITION LENGTH.

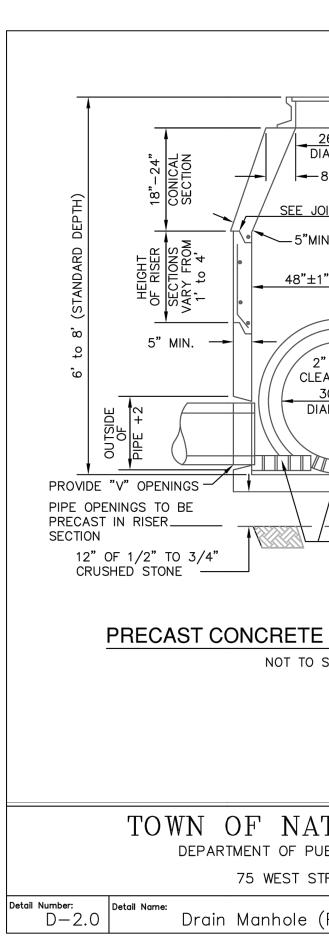
TOWN OF NATICK, MASSACHUSETTS DEPARTMENT OF PUBLIC WORKS - ENGINEERING DIVISION 75 WEST STREET NATICK, MA 01760 Date Last Updated: Detall Name: 03/01/2016

Detail Number: R—2.0 Wheelchair Ramp Notes

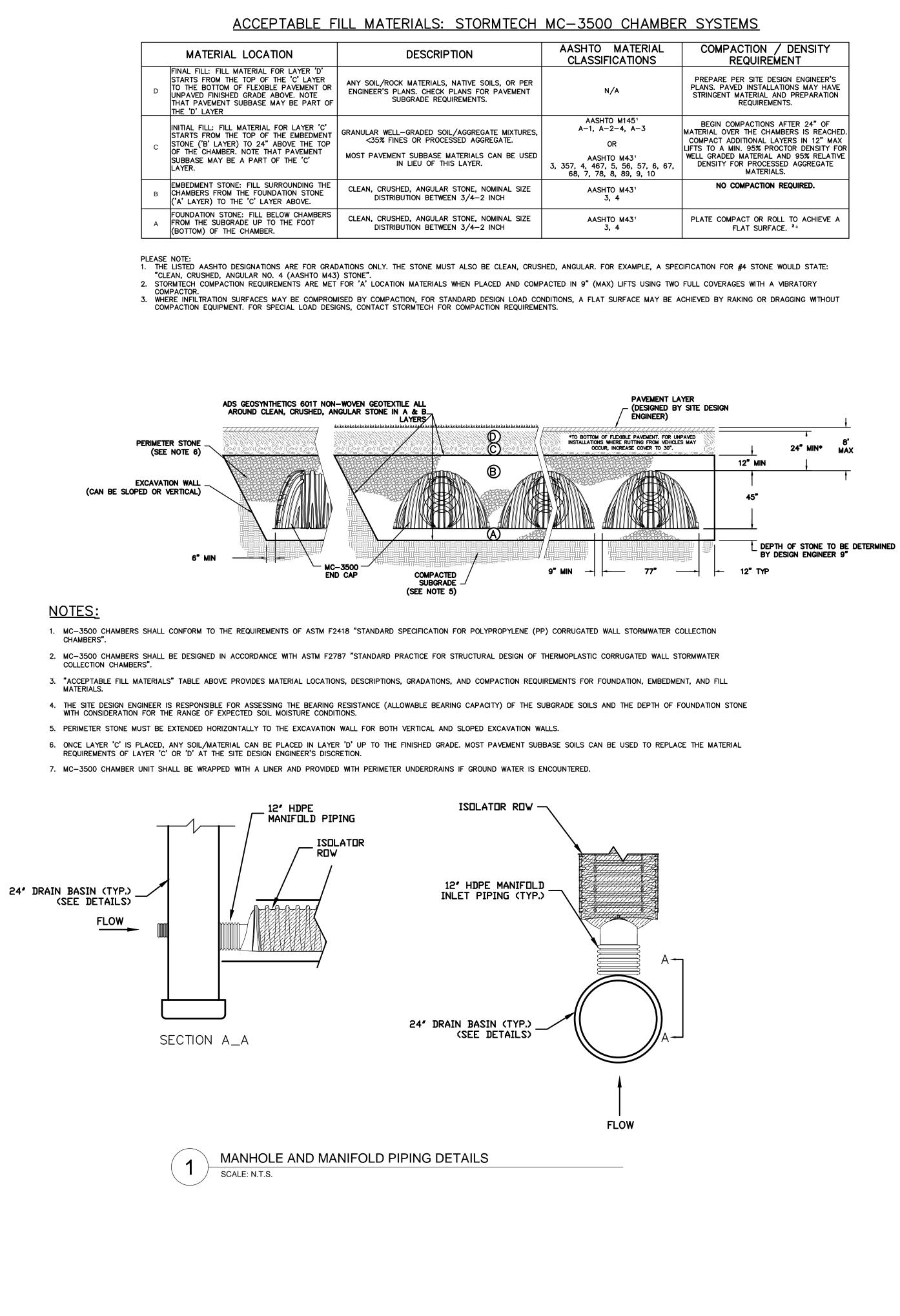




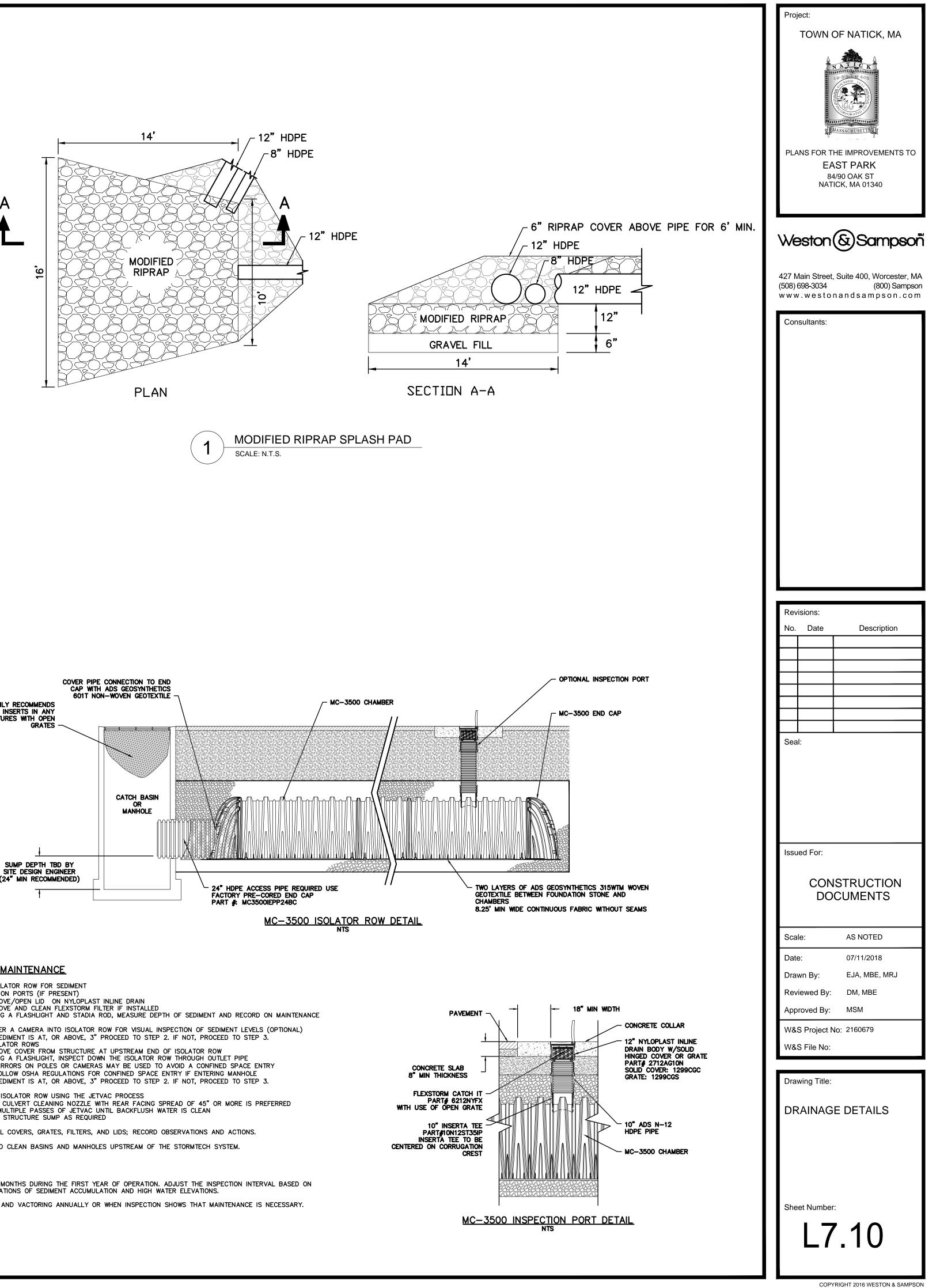




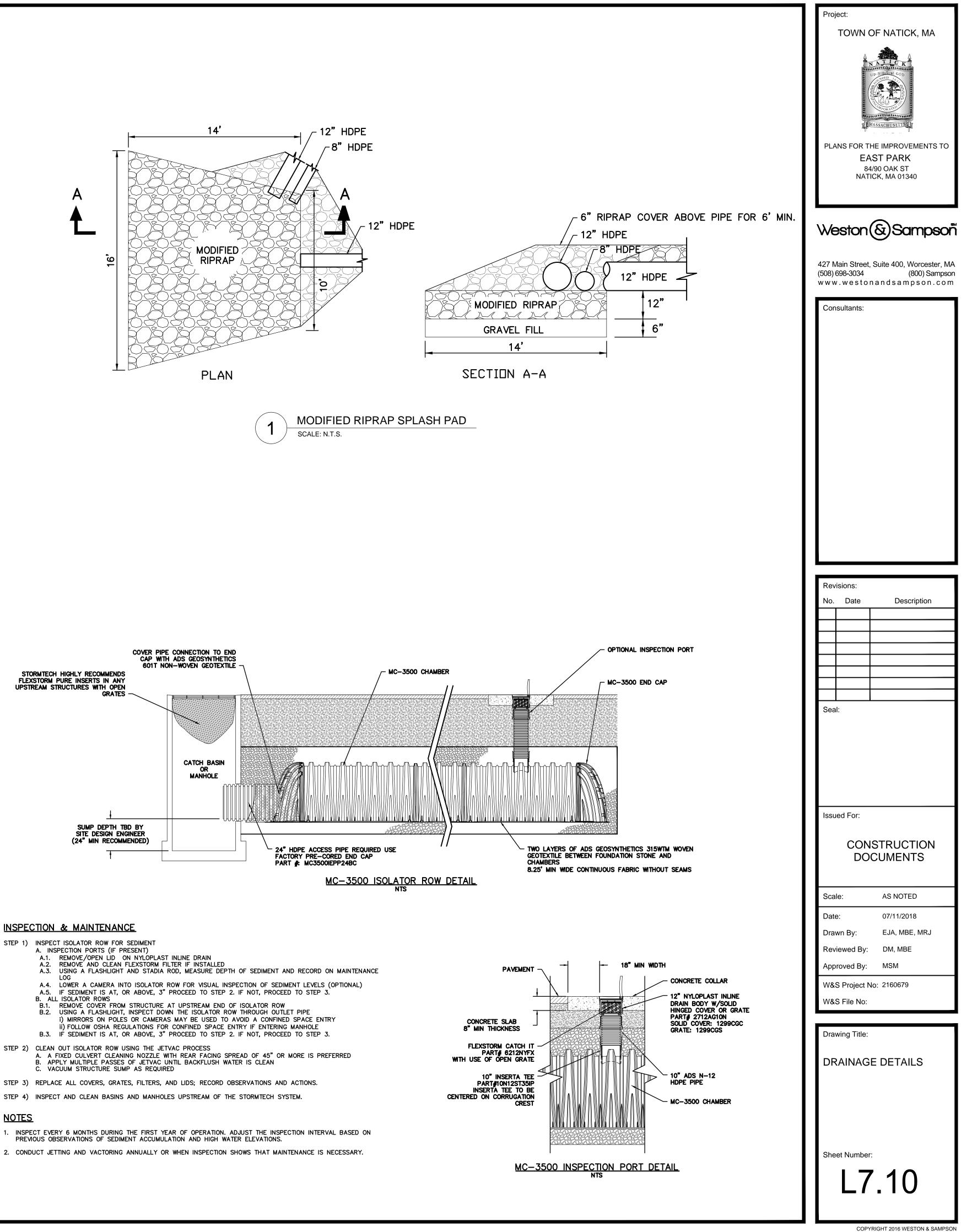
	Project:
	TOWN OF NATICK, MA
NS OF THE ARCHITECTURAL WITH DISABILITIES ACT AND NSTRUCTION STANDARDS. TRANSITION LENGTH 6'-6" MIN. EDGE OF ROADWAY	PLANS FOR THE IMPROVEMENTS TO
GRANITE CURB	EAST PARK 84/90 OAK ST
7.5%*	NATICK, MA 01340
VHEELCHAIR D RAMP SIDEWALK D	
	Weston & Sampson
URE	427 Main Street, Suite 400, Worcester, MA (508) 698-3034 (800) Sampson w w w . w e s t o n a n d s a m p s o n . c o m
TRANSITION LENGTH     DETECTABLE WARNING PANEL       SIDEWALK     7.5%       SIDEWALK     1.5%       RDADWAY	Consultants:
SECTION D-D CEMENT CONCRETE = 4" GRAVEL BORROW = 8" MIN.	
WHEELCHAIR RAMP TYPE D NOT TO SCALE	
ENGTH GTH TION ±0.5% AAB IS NOT TO BE LESS THAN OF DETECTABLE WARNING	
OF NATICK, MASSACHUSETTS RTMENT OF PUBLIC WORKS – ENGINEERING DIVISION 75 WEST STREET NATICK, MA 01760	
r Ramp Type D Dote Last Updated: 03/01/2016	Revisions: No. Date Description
STANDARD MANHOLE FRAME & COVER TO BE EQUAL TO EJUSA 0MA226000002(FRAME) EJUSA 0MA211000005(COVER) COVER TO READ "DRAIN".	Seal:
26"±1" HARD RED SEWER BRICKS MAY BE USED FOR GRADE ADJUSTMENTS. (2 MIN – 5 MAX COURSES OF BRICK). FRAME TO BE SET IN FULL BED OF MORTAR. JOINT DETAILS MIN. BUTYL RUBBER JOINT (TYP.)	Jeai.
±1" DIAMETER MIN. 0.12 SQ. IN. STEEL PER VERT. FOOT, PLACED ACCORDING TO AASHTO DESIGNATION M 189	
2" AND OVER 1" COVER	Issued For: CONSTRUCTION
LEAR <u>30"DIA.</u> DIAM. PIPE HEADERS LAID FLAT.	DOCUMENTS
BRICK CHIPS AND MORTAR OR CEMENT CONC. CLASS "A"	Scale: AS NOTED
5" MIN.	Date: 07/11/2018
- /	Drawn By:EJA, MBE, MRJReviewed By:DM, MBEApproved By:MSM
E MANHOLE DETAILS	W&S Project No: 2160679 W&S File No:
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	TOWN STANDARD SITE CONSTRUCTION DETAILS
ATICK, MASSACHUSETTS public works – engineering division street natick, ma 01760	
(Precast) Date Last Updated: 03/01/2016	Sheet Number:
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-	COMPACTION / DENSITY REQUIREMENT
	PREPARE PER SITE DESIGN ENGINEER'S PLANS. PAVED INSTALLATIONS MAY HAVE STRINGENT MATERIAL AND PREPARATION REQUIREMENTS.
67,	BEGIN COMPACTIONS AFTER 24" OF MATERIAL OVER THE CHAMBERS IS REACHED. COMPACT ADDITIONAL LAYERS IN 12" MAX LIFTS TO A MIN. 95% PROCTOR DENSITY FOR WELL GRADED MATERIAL AND 95% RELATIVE DENSITY FOR PROCESSED AGGREGATE MATERIALS.
	NO COMPACTION REQUIRED.
	PLATE COMPACT OR ROLL TO ACHIEVE A







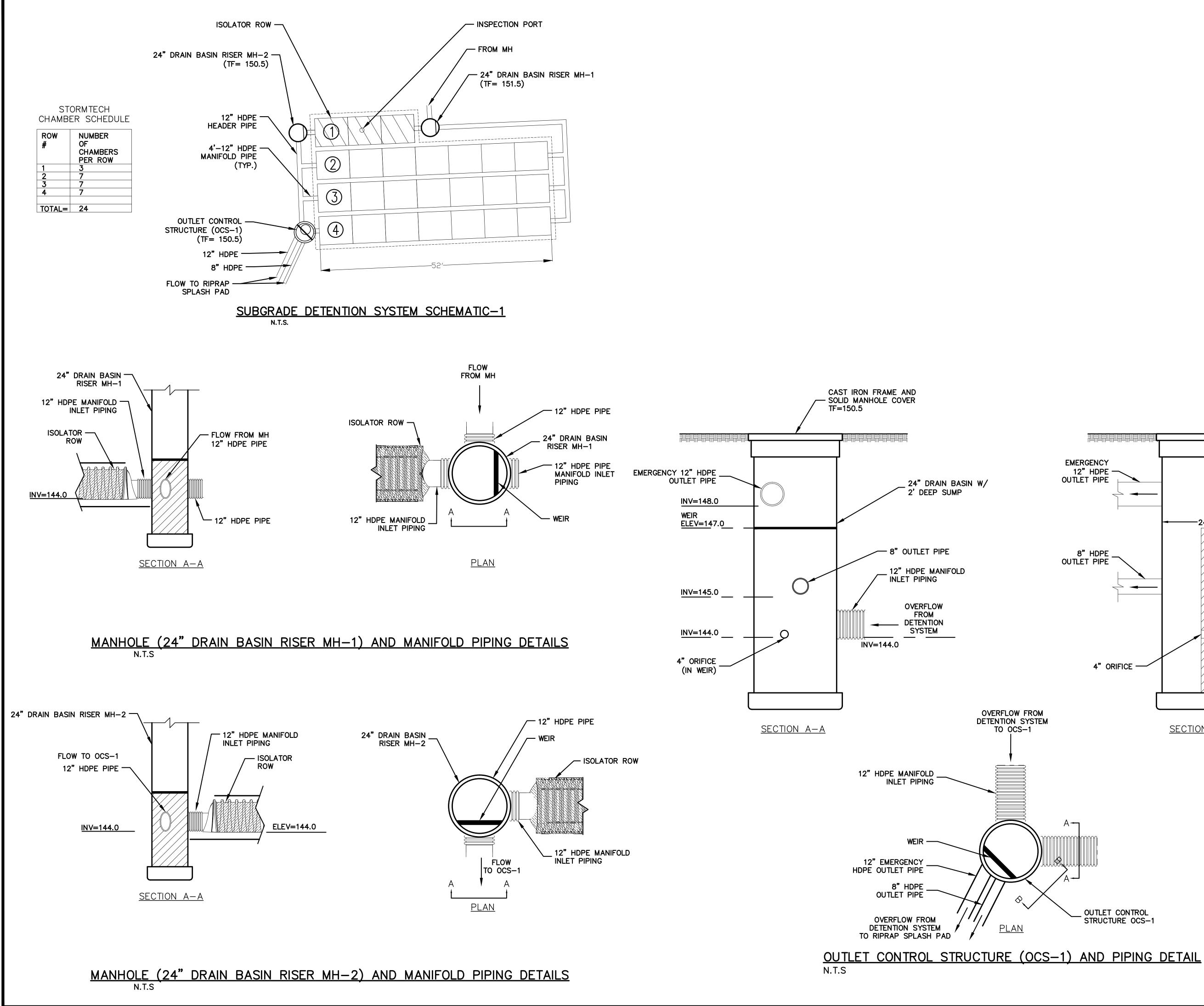
**INSPECTION & MAINTENANCE** 

STEP 1) INSPECT ISOLATOR ROW FOR SEDIMENT

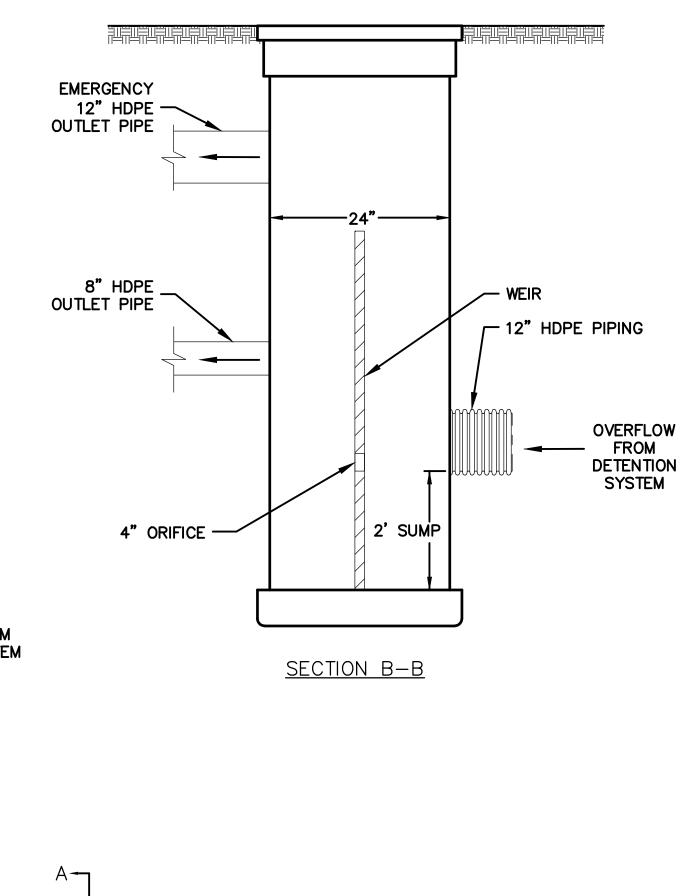
STEP 2) CLEAN OUT ISOLATOR ROW USING THE JETVAC PROCESS

STEP 4) INSPECT AND CLEAN BASINS AND MANHOLES UPSTREAM OF THE STORMTECH SYSTEM.

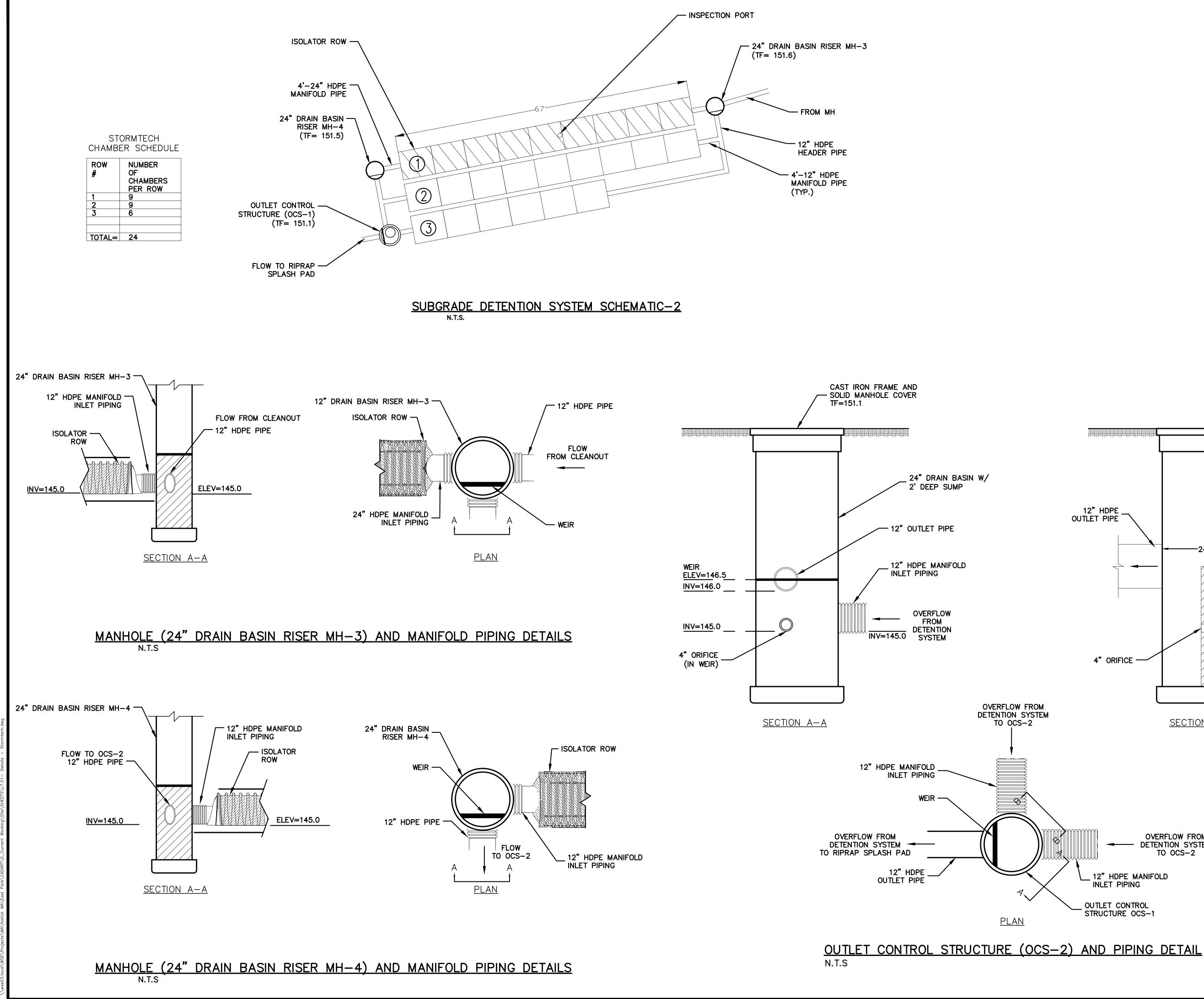
## NOTES



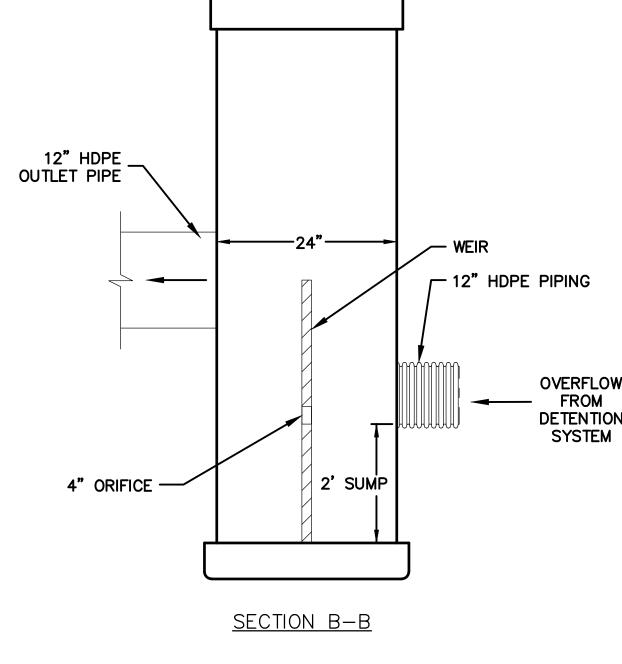
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PLANS FOR THE IMPROVEMENTS TO EAST PARK 84/90 OAK ST NATICK, MA 01340
Weston & Sampson
427 Main Street, Suite 400, Worcester, MA (508) 698-3034 (800) Sampson w w w . w e s t o n a n d s a m p s o n . c o m
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Scale: AS NOTED Date: 07/11/2018
Drawn By: EJA, MBE, MRJ
Reviewed By: DM, MBE Approved By: MSM
W&S Project No: 2160679 W&S File No:
Drawing Title:
DRAINAGE DETAILS
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\_ OUTLET CONTROL STRUCTURE OCS-1



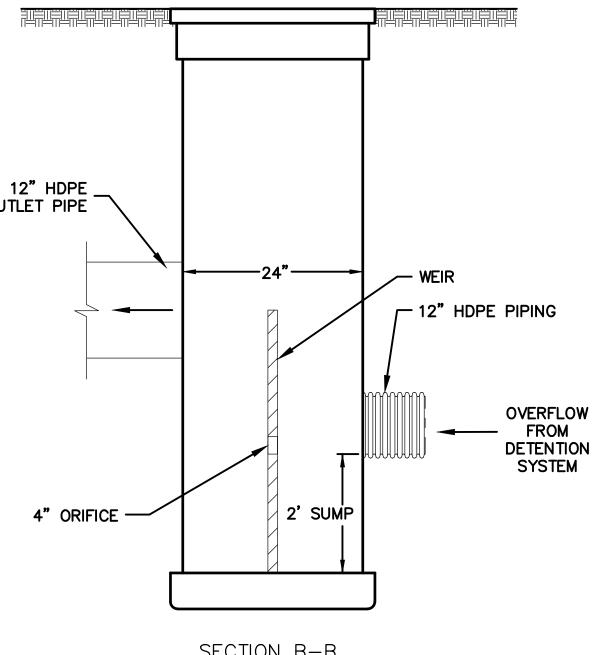
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MASSACHUSETTS	
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Weston & Sampson	
427 Main Street, Suite 400, Worcester, MA (508) 698-3034 (800) Sampson w w w . w e s t o n a n d s a m p s o n . c o m	
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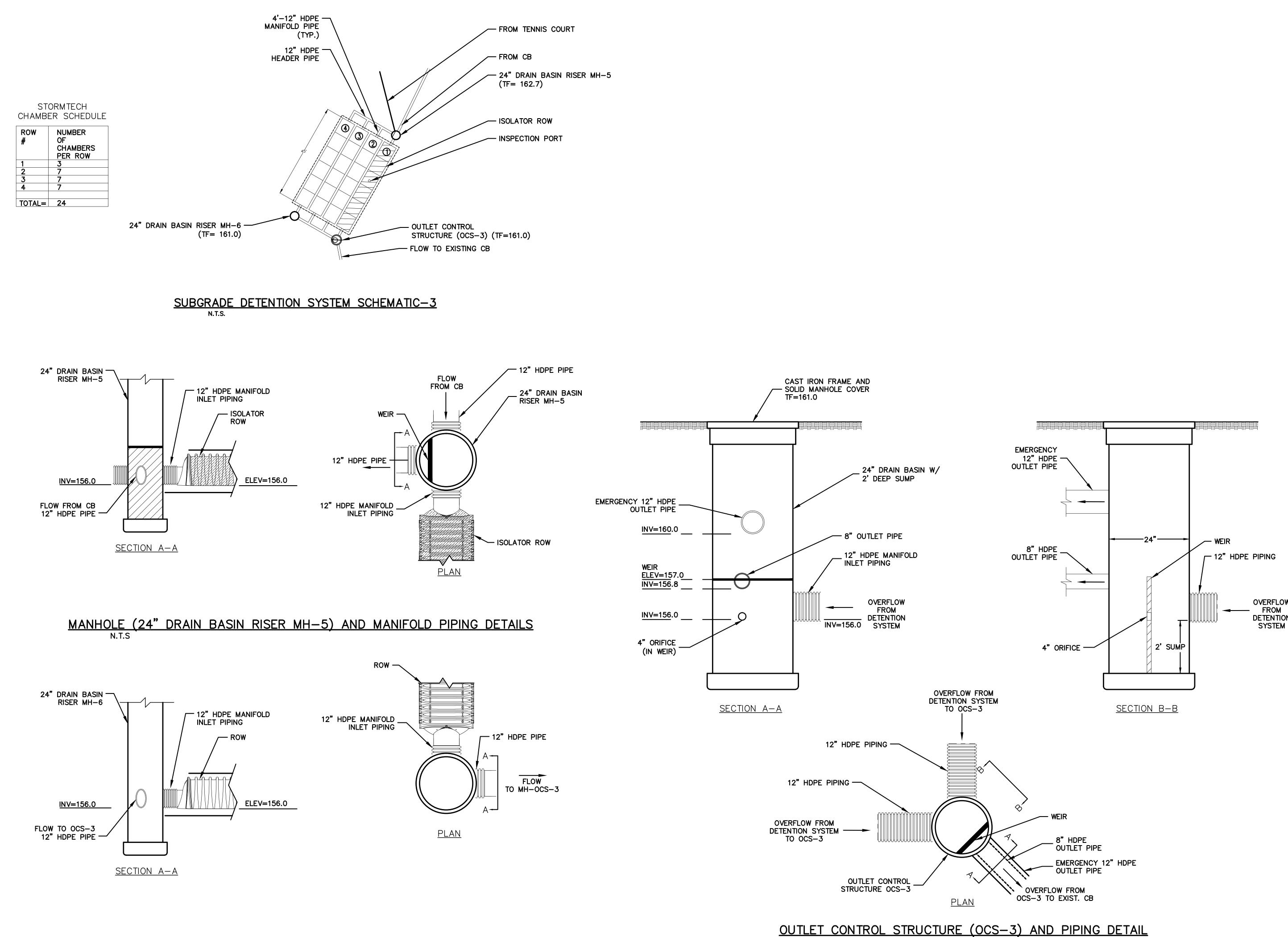


OVERFLOW FROM - DETENTION SYSTEM TO OCS-2

\_\_OUTLET\_CONTROL STRUCTURE\_OCS-1

\_ 12" HDPE MANIFOLD INLET PIPING

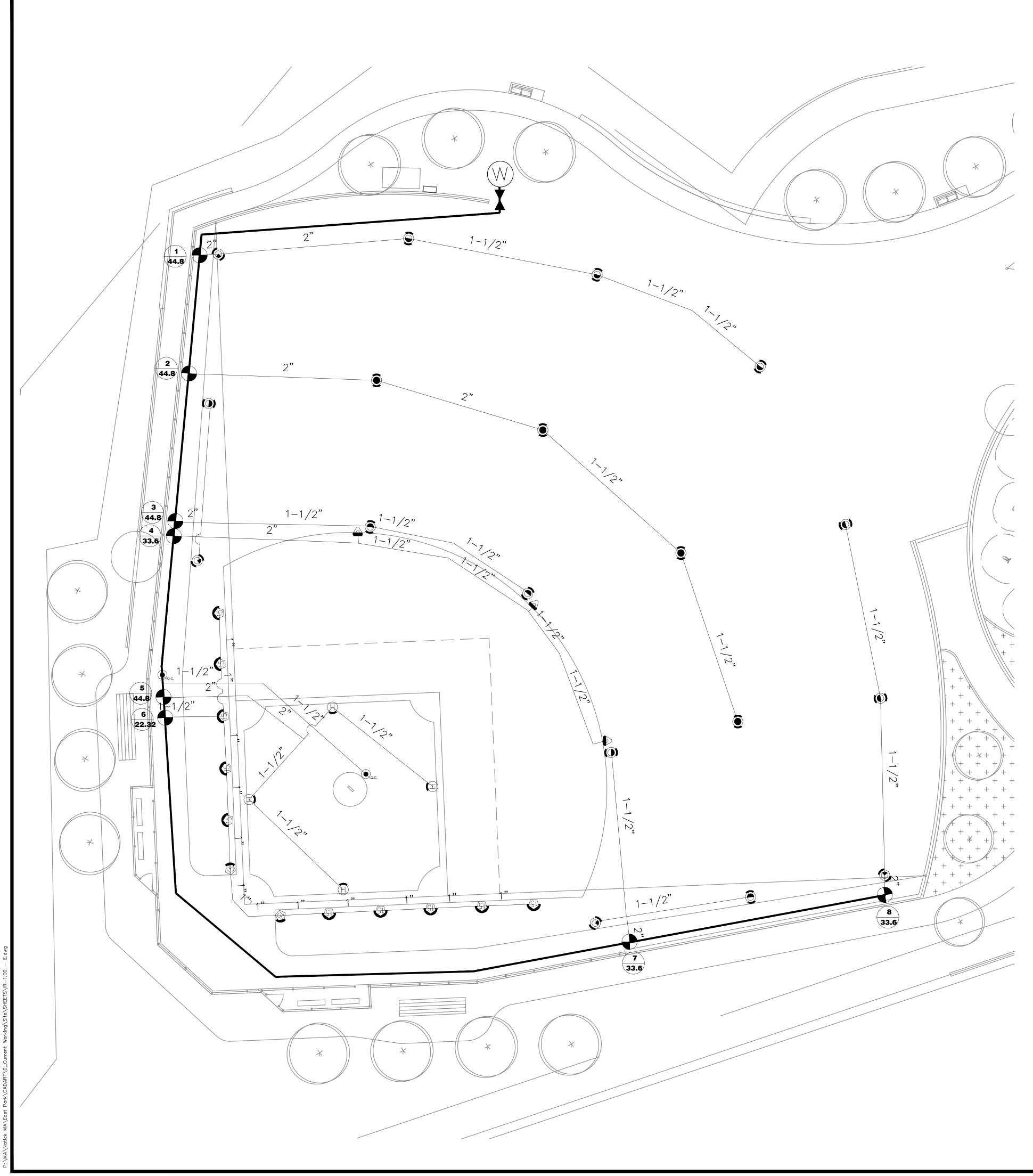




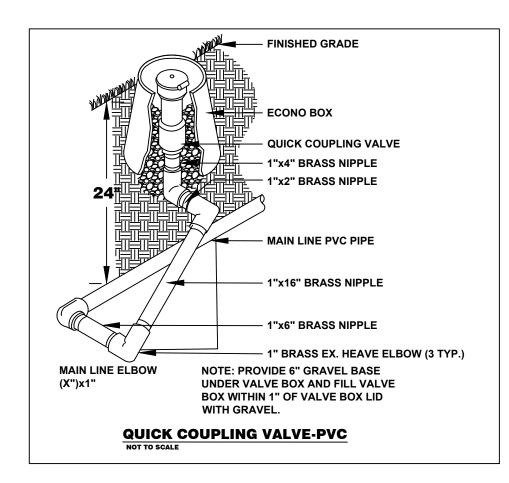
MANHOLE (24" DRAIN BASIN RISER MH-6) AND MANIFOLD PIPING DETAILS

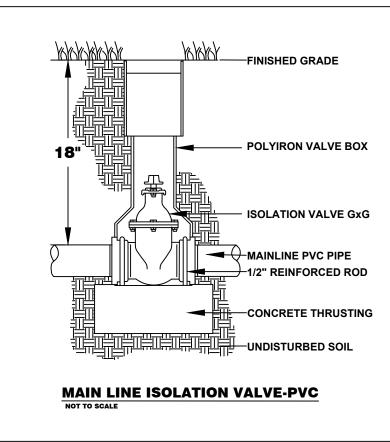
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	Weston&Sampson		
	427 Main Street, Suite 400, Worcester, MA (508) 698-3034 (800) Sampson w w w . w e s t o n a n d s a m p s o n . c o m		
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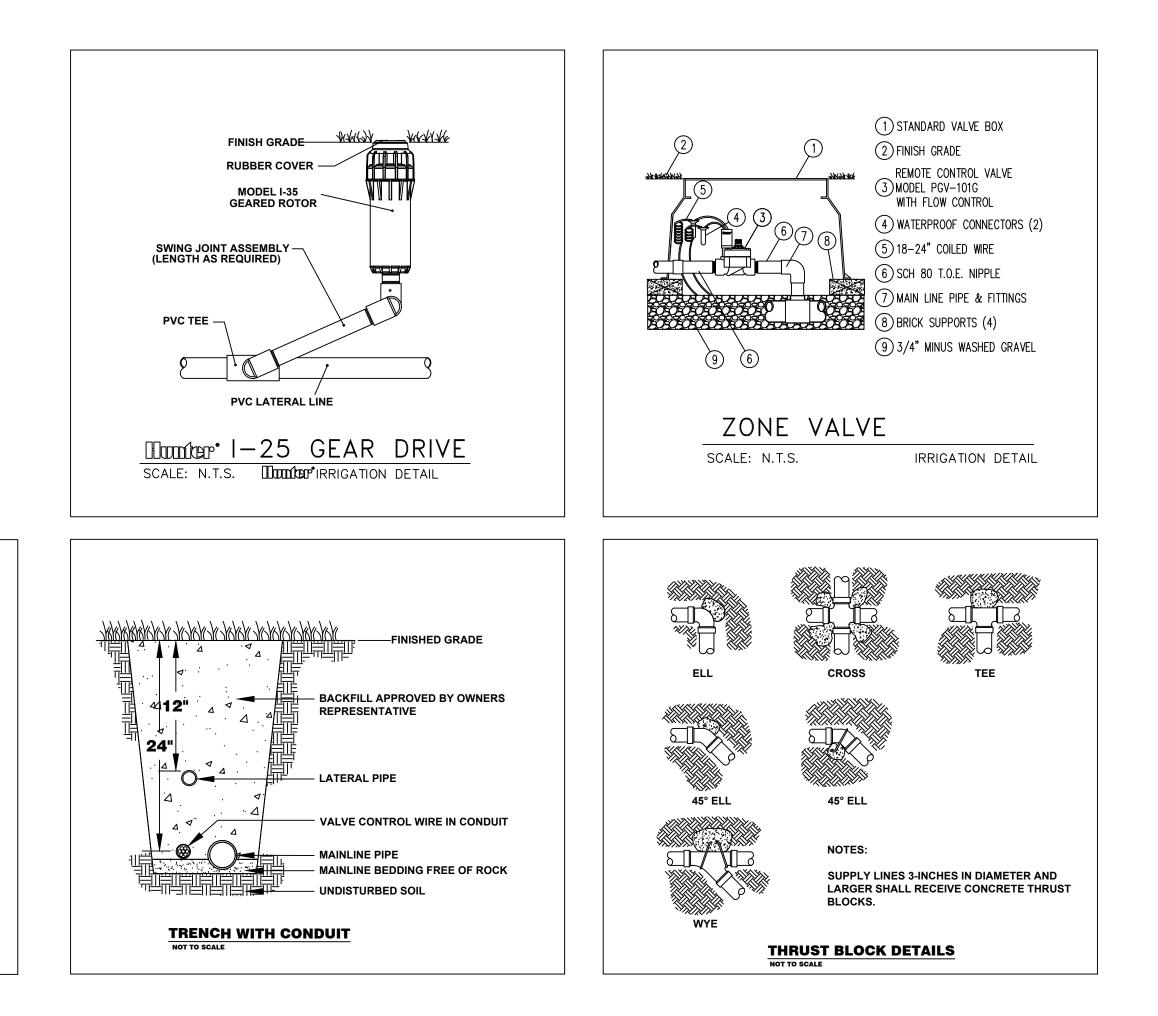


		ור	Project:
			TOWN OF NATICK, MA
Irrigation Pipe Ta Symbol <u>1-1/2"</u> <u>2"</u>	able Pipe 1-1/2" 200 PSI SDR 21 PVC PIPE, LATERALS 2" 200 PSI SDR 21 PVC PIPE, LATERALS 2-1/2" 200 PSI SDR 21 PVC PIPE, MAIN LINE		UP BLAMM GOD
	4" 200 PSI SDR 21 PVC PIPE, SLEEVES		PLANS FOR THE IMPROVEMENTS TO EAST PARK
rrigation Equipn Symbol	Equipment		84/90 OAK ST NATICK, MA 01340
Ð	HUNTER ICV-151G 1-1/2" ZONE VALVE		
Q <sub>a.c.</sub>	QUICK COUPLER VALVE WELL( SEE SPEC)	1'	
	CONTROLLER, SEE SPECIFICATIONS		Weston & Sampson
rrigation Heads			407 Main Chroat Cuita 400 Managatan MA
Symbol	Sprinkler Heads		427 Main Street, Suite 400, Worcester, MA (508) 698-3034 (800) Sampson w w w . w e s t o n a n d s a m p s o n . c o m
<ul><li>A</li></ul>	HUNTER I-25-04-SS-13 ROTORS HUNTER I-25-04-SS-HS-13 ROTORS	Ι.	·
0000	HUNTER I-25-04-SS-13 ROTORS		Consultants:
( <b>b</b> -( <b>b</b> )	HUNTER PROS-04-CV-15A SPRAYS		CENTRAL TURF & IRRIGATION SUPPLY
IRRIGATION IRRIGATION WILL BE APP REPRESENT CONTRACTC EQUIPMENT DUE TO THE SITE PLANS, TO GUARAN AREAS IN CA CONFLICT W ALL LATERAI ALL MAINLIN ALL SIDEWA	R RESPONSIBLE FOR VERIFICATION OF		
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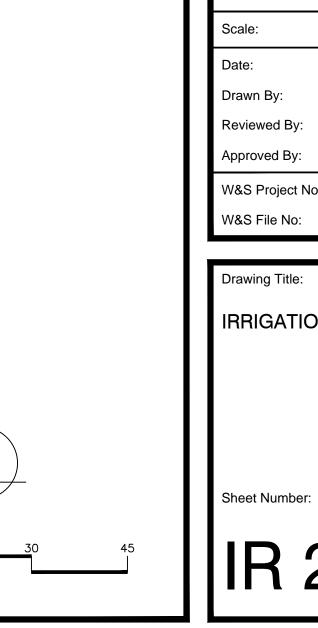


<b>GENERAL NOTES - IRRIGATION</b>
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- IRRIGATION DRAWINGS ARE DIAGRAMMATIC. ALL IRRIGATION EQUIPMENT PLACED IN THE FIELD WILL BE APPROVED BY THE OWNER OR ITS
- WILL BE APPROVED BY THE OWNER OR ITS REPRESENTITIVE. CONTRACTOR RESPONSIBLE FOR VERIFICATION OF
- EQUIPMENT QUANITY. DUE TO THE SCALE, ACCURACY OR CONDITION OF SITE PLANS, CONTRACTOR WILL MODIFY PATTERN
- TO GUARANTEE 100% COVERAGE OF INDICATED AREAS IN CASES WHERE SITE DIMENSIONS CONFLICT WITH DRAWING.
- ALL LATERAL PIPE WILL BE AS MARKED.
- ALL MAINLINE WILL BE AS MARKED.
- ALL SIDEWALK CROSSINGS TO BE SLEEVED.
- BACKFLOW AS PER LOCAL CODES.
- FLOW RATE IS 44.8 GPM @ 80 PSI
- <u>GENERAL IRRIGATION NOTES</u> 1. THE IRRIGATION CONTRACTOR SHALL BECOME THOROUGHLY FAMILIAR WITH THE SPECIFICATIONS FOR THIS AND RELATED WORK PRIOR CONSTRUCTION.
- 2. SPRINKLER SYSTEM DESIGN IS BASED ON MINIMUM OPERATING PRESSURE AND MAXIMUM FLOW DEMAND SHOWN ON IRRIGATION DRAWINGS. VERIFY WATER PRESSURE PRIOR TO CONSTRUCTION.
- 3.THIS DESIGN IS DIAGRAMMATIC. PIPING, VALVES, ETC. MAY BE SHOWN WITHIN PAVED AREAS FOR DESIGN CLARIFICATION ONLY AND SHALL BE INSTALLED IN LANDSCAPED AREAS. AVOID CONFLICTS BETWEEN IRRIGATION SYSTEM, PLANTING AND ARCHITECTURAL FEATURES.
- 4.NO VALVE BOXES SHALL BE PLACED WITHIN PEDESTRIAN AREAS. EXACT CLEAR DISTANCE REQUIRED FROM ACTIVE AREAS SHALL BE VERIFIED PRIOR TO CONSTRUCTION. DO NOT PLACE VALVE BOXES IN LOW AREAS.
- 5. DO NOT WILLFULLY INSTALL IRRIGATION SYSTEM AS INDICATED ON DRAWINGS WHEN IT IS OBVIOUS IN FIELD THAT OBSTRUCTIONS, GRADE DIFFERENCES IN AREA DIMENSIONS EXIST THAT MIGHT NOT HAVE BEEN CONSIDERED DURING DESIGN. BRING SUCH OBSTRUCTIONS OR DIFFERENCES TO THE ATTENTION OF OWNER'S AUTHORIZED REPRESENTIVE. IN EVENT THIS NOTIFICATION IS NOT PERFORMED, CONTRACTOR ASSUMES RESPONSIBILITY FOR REVISIONS.
- 6. INSTALL PIPE MATERIALS AND EQUIPMENT AS SHOWN IN DETAILS.
- 8. THE IRRIGATION CONTRACTOR SHALL TURN OVER TO THE OWNER: TWO OF EACH OF ALL OPERATING KEYS AND SERVICING TOOLS NEEDED FOR COMPLETE ACCESS, ADJUSTMENT, AND REPAIR OF ALL IRRIGATION SYSTEM COMPONENTS. THIS INCLUDES SPECIALIZED TOOLS REQUIRED FOR COMPLETE DISASSEMBLY OF EACH SPRINKLER AND VALVE.

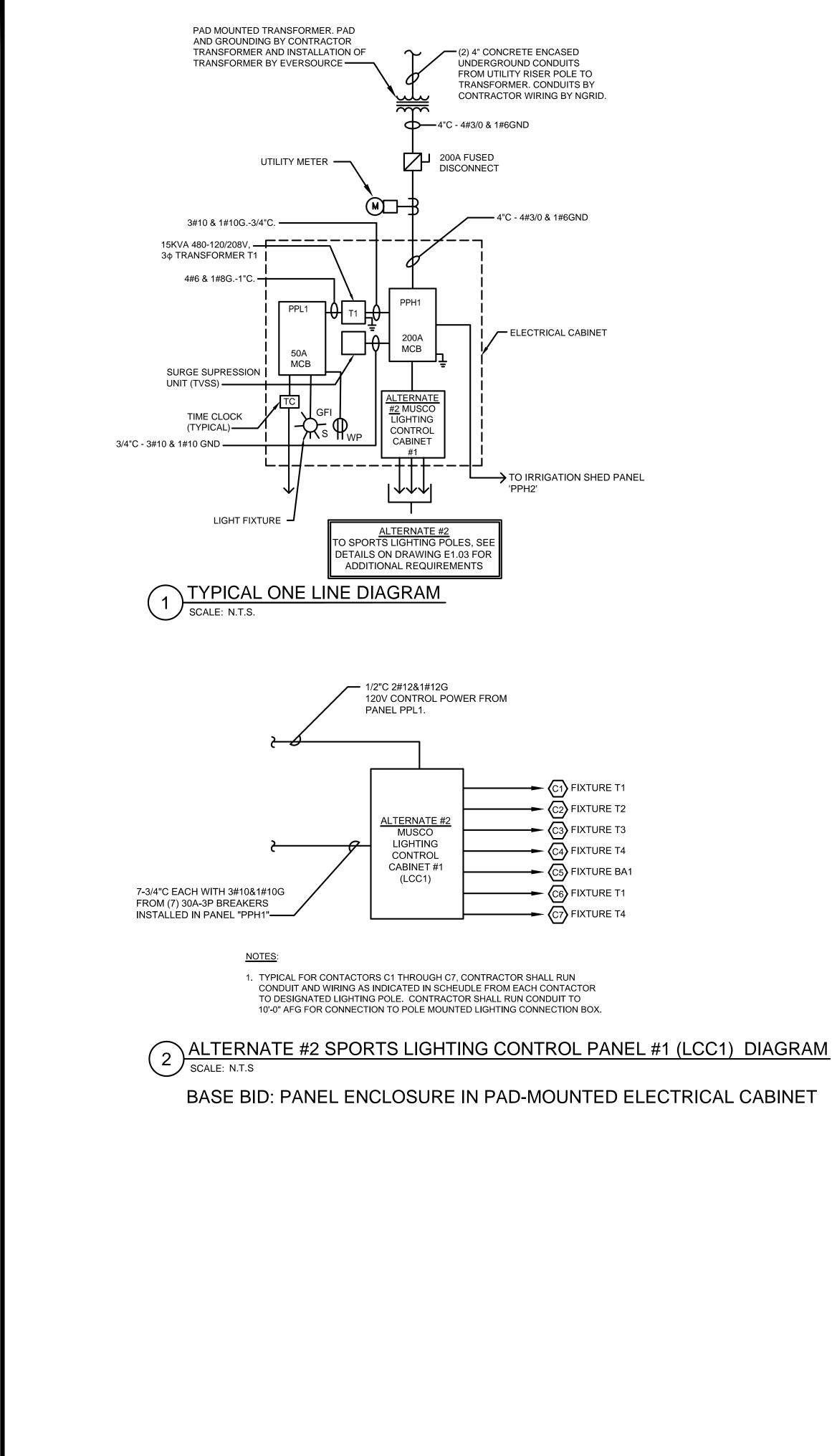
## SPRINKLER NOTES

- 1.INSTALL POP-UP TYPE SPRINKLER HEADS INSTLALLED IN PLANTING AREAS SO THAT TOP OF SPRINKLER HEAD IS AT LEAST  $\frac{1}{4}$ " LOWER THAN ADJACENT SIDEWALK OR CURB.
- 2.SET SPRINKLER HEADS FLUSH WITH AND PERPENDICULAR TO FINISH GRADE OF AREA TO BE IRRIGATED UNLESS OTHERWISE INDICATED ON DRAWINGS.
- 3.WHEN VERTICAL OBSTRUCTIONS (FIRE HYDRANTS, TREES, LIGHTS, ETC.) INTERFERE WITH SPRAY PATTERN OF SPRINKLERS HEADS SO AS TO PREVENT PROPER COVERAGE, ADJUST SPRINKLER SYSTEM BY INSTALLING A SPRINKLER HEAD ON EACH SIDE OF OBSTRUCTION AND ADJUST ARC SO AS TO PROVIDE PROPER COVERAGE. PERFORM ADJUSTMENTS AT NO COST TO OWNERS AUTHORIZED REPRESENTATIVE.
- 4.FLUSH AND ADJUST SPRINKLERS FOR OPTIMUM PERFORMANCE AND TO PREVENT OVER SPRAY ONTO WALKS, ROADWAYS, AND BUILDINGS. THIS INCLUDES SELECTING THE BEST DEGREE OF ARC TO FIT SITE CONDITIONS AND TO THROTTLE FLOW CONTROL AT EACH VALVE TO OBTAIN OPTIMUM PRESSURE FOR EACH SYSTEM. DO NOT ADJUST ROTOR HEADS TO LESS THAN MAXIMUM THROW UNLESS SUCH ADJUSTMENT IS NEEDED TO AVOID OVERSPRAY ONTO BUILDINGS OR HARDSCAPE.
- 5. INSTALL SPRINKLERS AS SHOWN ON DETAILS.



<u>SCALE</u>

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IRRIGATION DETAILS



## GENERAL ELECTRICAL NOTES

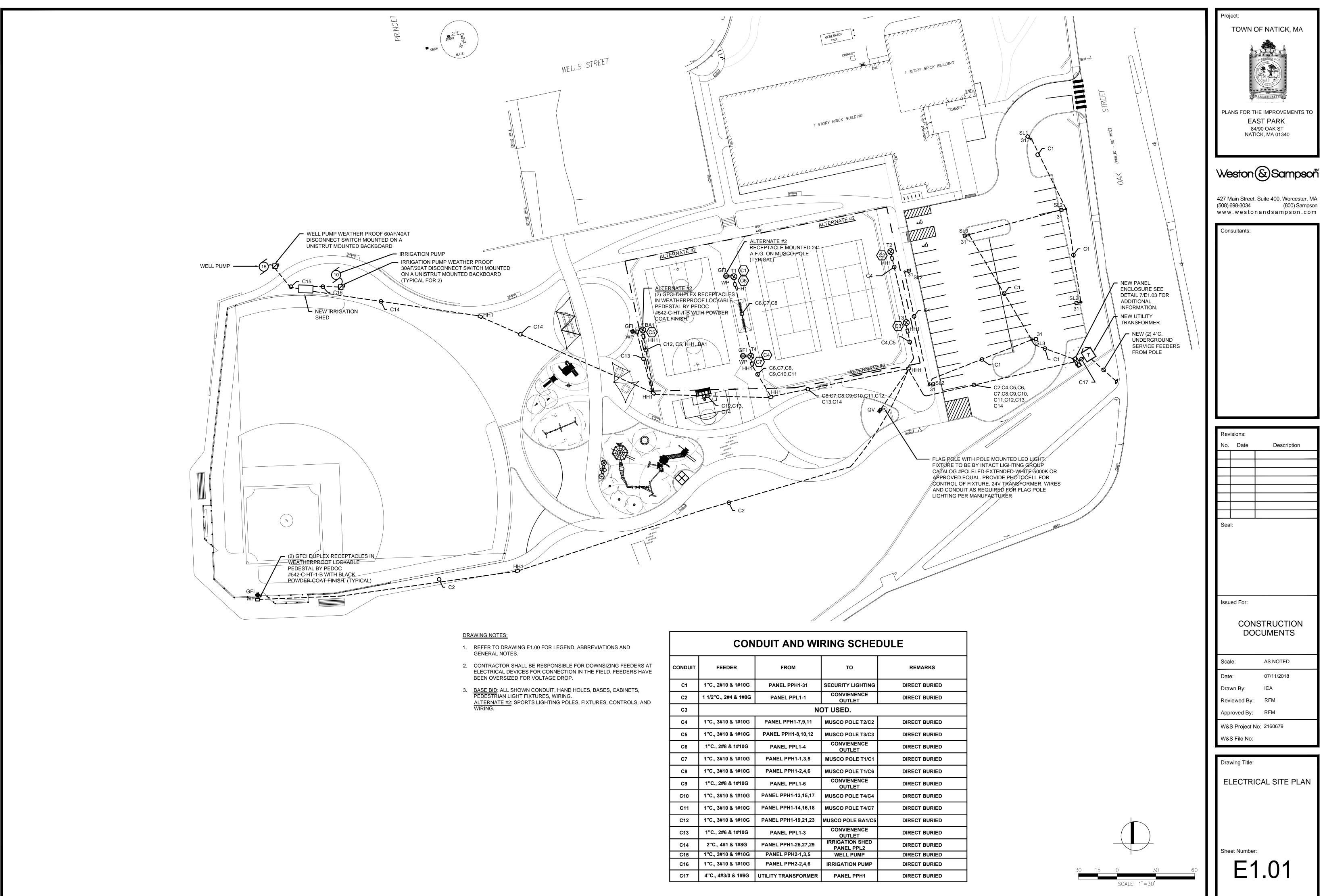
- 1. DRAWINGS ARE DIAGRAMMATIC ONLY. THE EXACT LOCATION, MOUNTING HEIGHTS, SIZE OF EQUIPMENT AND ROUTING OF RACEWAYS SHALL BE COORDINATED AND DETERMINED IN THE FIELD.
- 2. WORK SHALL CONFORM TO THE MASSACHUSETTS ELECTRICAL CODE AND MASSACHUSETTS BUILDING CODE AND REQUIREMENTS OF LOCAL AUTHORITIES HAVING JURISDICTION.
- 3. THE WORD "CONTRACTOR" AS USED IN THE "ELECTRICAL WORK" SHALL MEAN THE ELECTRICAL SUBCONTRACTOR.
- 4. CONTRACTOR SHALL PAY FOR ALL PERMITS, INSURANCE AND TESTS, AND SHALL PROVIDE LABOR AND MATERIAL TO COMPLETE THE ELECTRICAL WORK SHOWN.
- 5. CONTRACTOR SHALL PAY ELECTRIC UTILITY COMPANY BACKCHARGES AND PROVIDE COORDINATION WITH SAME.
- 6. EXCEPT AS OTHERWISE NOTED, THE ELECTRICAL WORK SHALL INCLUDE PANELBOARDS, CIRCUIT BREAKERS, FEEDERS, WIRING, RACEWAYS, LIGHTING FIXTURES, DEVICES, SAFETY SWITCHES, MOUNTING AND WIRING, TRANSFORMERS AND CONNECTIONS NECESSARY TO OPERATE ALL EQUIPMENT.

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- 7. THE CONTRACTOR SHALL PROVIDE ALL TEMPORARY LIGHTING AND POWER AND PAY ALL ENERGY CHARGES.
- 8. DURING CONSTRUCTION, THE ELECTRICAL CONTRACTOR SHALL KEEP HIS PORTION OF THE WORK NEAT, CLEAN AND ORDERLY,
- 9. ALL SYSTEMS SHALL BE TESTED FOR SHORT CIRCUIT AND GROUNDS PRIOR TO ENERGIZING AND ANY DEFECTS SHALL BE CORRECTED.
- 10. ALL CUTTING AND PATCHING REQUIRED FOR ELECTRICAL WORK SHALL BE INCLUDED AS PART OF THIS SECTION.
- 11. COMPLETE SHOP DRAWINGS SHALL BE SUBMITTED FOR ELECTRICAL EQUIPMENT. WHERE SPECIFIED ELECTRICAL EQUIPMENT IS SUBSTITUTED, THE ELECTRICAL CONTRACTOR SHALL SUBMIT COMPLETE SPECIFICATIONS ON THE SUBSTITUTE AS WELL AS THE ITEM ORIGINALLY SPECIFIED.
- 12. MATERIALS SHALL BE SPECIFICATION GRADE AND UL LISTED.
- 13. WHERE MATERIAL IS CALLED OUT IN THE LEGEND BY MANUFACTURER, TYPE OR CATALOG NUMBER, SUCH DESIGNATIONS ARE TO ESTABLISH STANDARDS OR DESIRED QUALITY. ACCEPTANCE OR REJECTIONS OF PROPOSED SUBSTITUTIONS SHALL BE SUBJECT TO THE APPROVAL OF THE ENGINEER.
- 14. WORK SHALL BE COORDINATED WITH THAT OF OTHER TRADES TO ELIMINATE INTERFERENCES.
- 15. ELECTRICAL WORK SHALL BE GUARANTEED FOR A PERIOD OF ONE YEAR FROM DATE OF WHICH SYSTEM IS PUT INTO SERVICE.
- 16. WORK SHALL BE GROUNDED IN ACCORDANCE WITH CODE REQUIREMENTS. COMPLETE EQUIPMENT (INSULATED GREEN WIRE) GROUNDING SYSTEM SHALL BE INSTALLED.
- 17. WIRE SHALL BE TYPE "THHN/THWN" INSULATED FOR 600 VOLTS, MINIMUM SIZE #12 AWG COPPER UNLESS SPECIFICALLY NOTED OTHERWISE.
- 18. WIRING METHODS:
- A. BELOW GRADE WIRING SHALL BE SCHEDULE 80 PVC.
- 19. PANELBOARDS SHALL BE DEAD FRONT, THERMAL MAGNETIC BOLT-ON CIRCUIT BREAKER TYPE, DESIGNED FOR SURFACE MOUNTING AS INDICATED ON PLAN, AND HAVING CONNECTIONS TO 277/480 VOLT, 3 PHASE, 4 WIRE SERVICE. ALL BUS BARS SHALL BE COPPER. CABINETS SHALL BE MADE OF CODE GAUGE GALVANIZED SHEET STEEL, WITH A MINIMUM OF 4 INCH GUTTERS, DOOR IN DOOR CONSTRUCTION, LOCKED DOOR, AND FLUSH HINGES. TYPEWRITTEN INDEX SHALL BE MOUNTED ON DOOR INSIDE TRANSPARENT COVER INDICATING LOAD SERVED. PANELS SHALL INCLUDE SEPARATE EQUIPMENT GROUND BUS.
- 20. CONDUIT RUNS AS SHOWN ON THE PLANS ARE DIAGRAMMATIC ONLY; EXACT LOCATION AND METHOD OF SUPPORT SHALL BE DETERMINED IN THE FIELD.
- 21. CONTRACTOR SHALL CHECK EXISTING CONDITIONS TO DETERMINE EXACT EXTENT OF WORK TO BE PERFORMED PRIOR TO BIDDING. DIMENSIONS RELEVANT TO EXISTING WORK SHALL BE VERIFIED IN THE FIELD.
- 22. PROVIDE AS-BUILT "CADD" DRAWINGS AT THE COMPLETION OF THE PROJECT.

	ELECTRICAL S		ΙΙΙΟΤ	Project:
	ELECTRICAL S			TOWN OF NATICK, MA
			125V, U-SLOT GROUNDED TYPE. ALL	UP-BIBLILM GOD
₽	OTHER MOUNTING HEIGHTS SHA	LL BE AS NO	TED ADJACENT TO THE SYMBOL. R SPECIAL PURPOSE RECEPTACLES	
GFI	DUPLEX RECEPTACLE WITH INTE	ERGRAL GRO	UND FAULT INTERRUPTER	MASSACHUSETTS
<u>R</u>	ACEWAY AND WIRI	<u>NG</u>		PLANS FOR THE IMPROVEMENTS TO EAST PARK 84/90 OAK ST
PP-1,3 <del>- ////</del>			ASH MARKS INDICATES NUMBER OF #12 AWG 9 SLASH MARKS INDICATE 2#12 & 1#12G, 3/4"C	NATICK, MA 01340
	UNLESS OTHERWISE NOTED	S NOT INDICA	TED BUT SHALL BE INCLUDED IN EACH	
	-HOMERUNS TO PANELBOARDS S	HALL HAVE	A MAXIMUM OF THREE PHASE CONDUCTORS ND CONDUCTOR IN EACH CONDUIT.	Weston (&) Sampson
	- OVERHEAD ELECTRIC LINE			
	- UNDERGROUND ELECTRIC LINE			427 Main Street, Suite 400, Worcester, MA (508) 698-3034 (800) Sampson w w w . w e s t o n a n d s a m p s o n . c o m
	MISCELLANEOUS			Consultants:
। ज	JUNCTION BOX WITH BLANK CO	/ERPLATE, SI	ZE AS REQUIRED BY N.E.C.	
C	CONTACTOR			
	ELECTRIC UTILITY BILLING METE	R		
マ 人				
10	MOTOR, '10' INDICATES HORSEP	JWER		
<u> </u>	POWER DISTRIBUTI	<u>ON EQ</u>	UIPMENT	
Ш НН1	HAND HOLE			
	IN-GROUND TRANSFORMER			
QV.	LIGHTING			
	SPORTS LIGHT POLE - 'P1' INDIC 'C1' INDICATES CONTACTOR OR CONTROLLING POLE MOUNTED	CONTRACTO		Revisions:
SL1	PEDESTRIAN LIGHTING - "SL1" IN	DICATES FIX	TURE	No. Date Description
0	TYPE. ABBREVI	ΔΤΙΟΝΙ	S	
А		NTS	NOT TO SCALE	
AF AC	AMPERE FRAME ALTERNATING CURRENT	PNL PH	PANELBOARD PHASE	
AT ATS	AMPERE TRIP AUTOMATIC TRANSFER SWITCH	FL FLA	FLOOR FULL LOAD AMPERE	
BKR C	BREAKER CONDUIT	GC GFI	GENERAL CONTRACTOR GROUND FAULT INTERRUPTER	Seal:
СКТ	CIRCUIT	GND	GROUND	
CB EC	CIRCUIT BREAKER ELECTRICAL CONTRACTOR	IG JB	ISOLATED GROUND JUNCTION BOX	
EMT KW	ELECTRIC METALLIC TUBING KILOWATT	KVA	KILOVOLT AMPERES	
MCB MLO	MAIN CIRCUIT BREAKER MAIN LUGS ONLY	PVC		
MC MTD	MECHANICAL CONTRACTOR MOUNTED	RSC XFMR	RIGID GALVANIZED STEEL CONDUIT TRANSFORMER	
MTG	MOUNTING	V W	VOLTS WATTS OR WIRE	Issued For:
NMC NA	NON-METALLIC CONDUIT NOT APPLICABLE	WP	WEATHERPROOF	CONSTRUCTION
NIC	NOT IN CONTRACT			DOCUMENTS
				Scale: NTS
				Date: 07/11/2018 Drawn By: ICA
				Reviewed By: RFM
				Approved By: RFM
				W&S Project No: 2160679
				W&S File No:
				Drawing Title:
				ELECTRICAL LEGEND
				AND NOTES
				Sheet Number:
				E1.00
				11 1



CONDUIT	FEEDER	FROM	то	F
C1	1"C., 2#10 & 1#10G	PANEL PPH1-31	SECURITY LIGHTING	DIRI
C2	1 1/2"C., 2#4 & 1#8G	PANEL PPL1-1	CONVIENENCE OUTLET	DIRI
C3		N	OT USED.	
C4	1"C., 3#10 & 1#10G	PANEL PPH1-7,9,11	MUSCO POLE T2/C2	DIRI
C5	1"C., 3#10 & 1#10G	PANEL PPH1-8,10,12	MUSCO POLE T3/C3	DIRI
C6	1"C., 2#8 & 1#10G	PANEL PPL1-4	CONVIENENCE OUTLET	DIRI
C7	1"C., 3#10 & 1#10G	PANEL PPH1-1,3,5	MUSCO POLE T1/C1	DIR
C8	1"C., 3#10 & 1#10G	PANEL PPH1-2,4,6	MUSCO POLE T1/C6	DIR
C9	1"C., 2#8 & 1#10G	PANEL PPL1-6	CONVIENENCE OUTLET	DIR
C10	1"C., 3#10 & 1#10G	PANEL PPH1-13,15,17	MUSCO POLE T4/C4	DIRI
C11	1"C., 3#10 & 1#10G	PANEL PPH1-14,16,18	MUSCO POLE T4/C7	DIRI
C12	1"C., 3#10 & 1#10G	PANEL PPH1-19,21,23	MUSCO POLE BA1/C5	DIRI
C13	1"C., 2#6 & 1#10G	PANEL PPL1-3	CONVIENENCE OUTLET	DIRI
C14	2"C., 4#1 & 1#8G	PANEL PPH1-25,27,29	IRRIGATION SHED PANEL PPL2	DIRI
C15	1"C., 3#10 & 1#10G	PANEL PPH2-1,3,5	WELL PUMP	DIRI
C16	1"C., 3#10 & 1#10G	PANEL PPH2-2,4,6	IRRIGATION PUMP	DIR
C17	4"C., 4#3/0 & 1#6G	UTILITY TRANSFORMER	PANEL PPH1	DIRI

A\Natick MA\East Park\CADART\0\_Current Working\Electrical\E1.02.dwg

										HEDU				
VOLTS	277/480V	REMARKS: (TC) INDICATES	TIME CLO	OCK CONTR	OLLED CI	RCU	IIT, S	SER\	VICE ENTR	RANCE RATE	Ð		MAINS	200A MCE
PHASE	3Ø												BUSSING	250A
WIRE	4W												FEED	
A.I.C.	30K												MOUNTING	SURFACE
CIRCUIT	SE	ERVICE DESCRIPTION	LOAD (KVA)	BREAKER	POLES	Α	в	с	POLES	BREAKER	LOAD (KVA)	SERVICE DESCRI	PTION	CIRCUIT
1		NATE #2 MUSCO POLE T1				•						MUSCO POLE T1 CONTACTOR C6		2
3		CONTACTOR C1		30A	3P		•		3P	30A				4
5								•					6	
7	ALTERN	NATE #2 MUSCO POLE T2		204	3P	•			3P	204		MUSCO POLE T3 CONTACTOR C3		8
9 11		CONTACTOR C2		30A	3P		•	•	3P	30A				10 12
13						•		-						12
15	ALTER	NATE #2_ MUSCO POLE T4		30A	3P	ŀ	•		3P	30A		MUSCO POLE T4 CONTACTOR C7		14
17		CONTACTOR C4		00/1	0.		-	•	Ŭ,	00/1				18
19						•								20
21	<u>ALTERN</u>	IATE #2_ MUSCO POLE BA1 CONTACTOR C5		30A	3P		•		3P	30A		SPARE		22
23		CONTACTOR CS						٠						24
25						٠								26
27		IRRIGATION SHED		100A	3P		٠		3P	30A		SPARE	28	
29								•						30
31	SITE S	SECURITY LIGHTING (TC)		20A	1P	•								32
33		MUSCO PANEL		20A	1P		•		3P	20A		SURGE PROTECTION	34	
35		SPARE		20A	1P			•						36
37		SPARE		20A	1P	•			20	20.4				38
39 41		SPARE SPARE		20A 20A	1P 1P		•	•	3P	30A		PANEL PPL1 VIA TRAN	ISFURIVIER	40 42

			Ν	IEW "F	PL1"	P	A٢	١E	L SC	HEDUI	E			
VOLTS	120/208V	REMARKS:											MAINS	50A MCB
PHASE	3Ø												BUSSING	100A
WIRE	4W												FEED	
A.I.C.	10K												MOUNTING	SURACE
CIRCUIT	SE	RVICE DESCRIPTION	LOAD (KVA)	BREAKER	POLES	Α	в	с	POLES	BREAKER	LOAD (KVA)	SERVICE DESCRIPTION		CIRCUIT
1		POWER PEDESTAL		20A	1P	٠			1P	20A		POLE OUTLE	Г	2
3		POWER PEDESTAL		20A	1P		•		1P	20A		POLE OUTLE	Г	4
5	CABINE	T LIGHT AND RECEPTACLE		20A	1P			•	1P	20A		POLE OUTLE	Г	6
7		SPARE		20A	1P	٠			1P	20A		SPARE		
9		SPARE		20A	1P		•		1P	20A		SPARE		
11		SPARE		20A	1P			•	1P	20A		SPARE		12

	NEW "PPH2" PANEL SCHEDULE															
VOLTS	277/480V	REMARKS: LOCATED IN IRF	RIGATION	SHED									MAINS	100A MCB		
PHASE	3Ø												BUSSING	100A		
WIRE	4W												FEED			
A.I.C.	22K												MOUNTING	SURACE		
CIRCUIT	SE	RVICE DESCRIPTION	LOAD (KVA)	BREAKER	POLES	A	в	с	POLES	BREAKER	LOAD (KVA)	SERVICE DESCRIPTION CI		CIRCUIT		
1						٠								2		
3		WELL PUMP	15HP	40A	3P		•		3P	30A	10HP	IRRIGATION PU	MP	4		
5								٠						6		
7		SPARE		20A	1P	•			1P	20A		SPARE 8				
9		SPARE		20A	1P		•		1P	20A		SPARE 10				
11		SPARE		20A	1P			•	1P	20A		SPARE 12				

# LIGHTING FIXTURE SCHEDULE

TYPE	MANUFACTURER	CATALOG NUMBER		LAMP	MOUNTING	VOLTAGE	LOAD	REMARKS
	MANOLACTORER		NO.	TYPE	MOONTING	VOLIAGE	LOAD	REMARKS
SL1	GARDCO	ECF-S-32L-1A-NW-G2-AR-2-VOLT-FINISH MOUNTED TO SSS4-16-4-11-D1-FINISH @ 16FT AFG TO BOF	-	LED	POLE	120	105W	SECURITY LIGHT WITH TYPE II DISTRIBUTION
SL2	GARDCO	ECF-S-32L-1A-NW-G2-AR-3-VOLT-FINISH MOUNTED TO SSS4-16-4-11-D1-FINISH @ 16FT AFG TO BOF	-	LED	POLE	120	105W	SECURITY LIGHT WITH TYPE III DISTRIBUTION
SL3	GARDCO	ECF-S-32L-1A-NW-G2-AR-4-VOLT-FINISH MOUNTED TO SSS4-16-5-11-D1-FINISH @ 16FT AFG TO BOF	-	LED	POLE	120	105W	SECURITY LIGHT WITH TYPE V DISTRIBUTION
SL4	GARDCO	ECF-S-32L-1A-NW-G2-AR-4-VOLT-FINISH MOUNTED TO SSS4-16-4-11-D1-FINISH @ 16FT AFG TO BOF	-	LED	POLE	120	105W	SECURITY LIGHT WITH TYPE IV DISTRIBUTION

LIGHTING FIXTURE SCHEDULE REQUIREMENTS

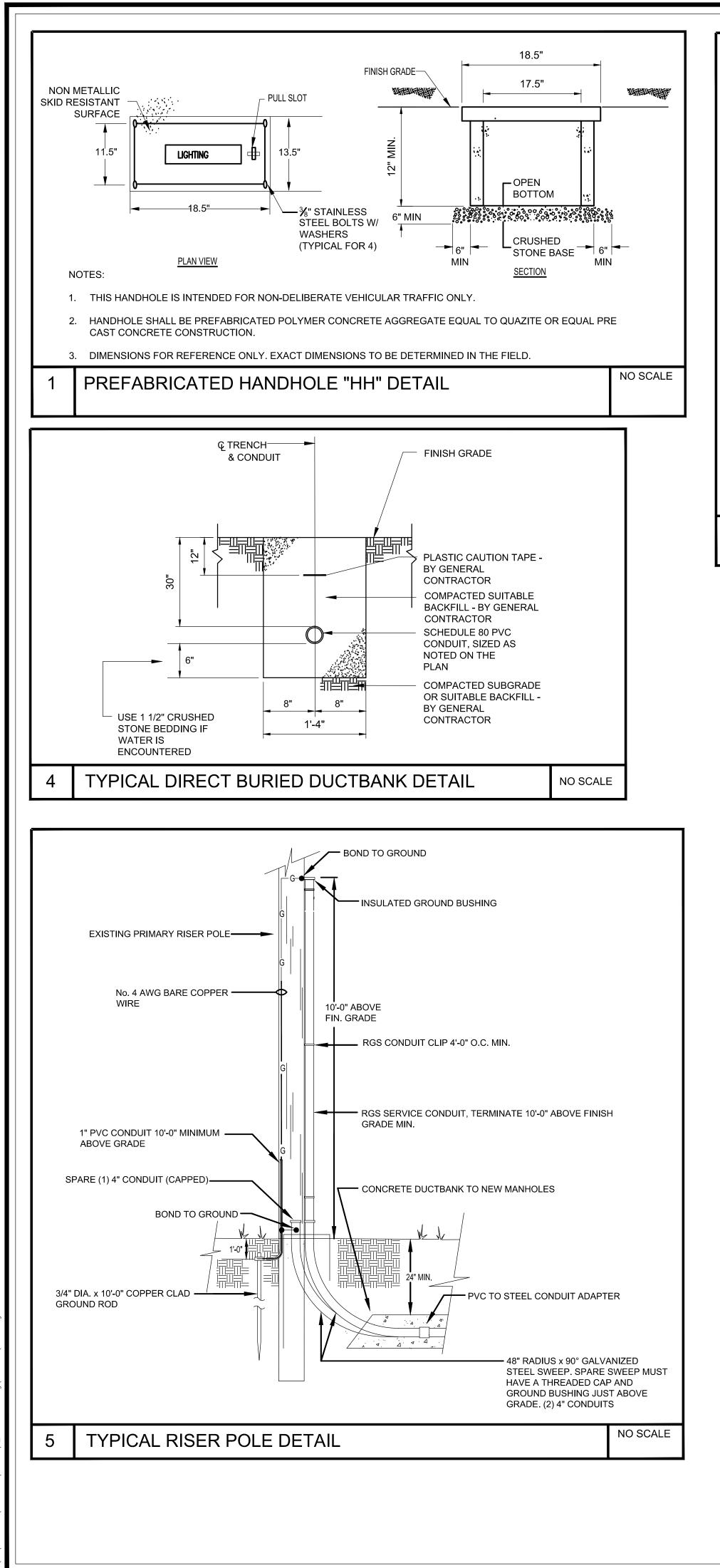
1. FURNISH AND INSTALL ALL MATERIALS, ACCESSORIES AND OTHER EQUIPMENT NECESSARY FOR THE COMPLETE AND PROPER INSTALLATION OF ALL LIGHTING FIXTURES INCLUDED IN THIS CONTRACT. PROVIDE ALL NECESSARY ACCESSORIES AS NECESSARY TO PROVIDE A COMPLETE LIGHTING SYSTEM.

2. SPECIFICATIONS AND DRAWINGS ARE INTENDED TO CONVEY THE FEATURES, FUNCTION AND CHARACTER OF THE FIXTURES ONLY, AND DO NOT UNDERTAKE TO SPECIFY EVERY ITEM OR DETAIL NECESSARY. MINOR DETAILS NECESSARY FOR THE PROPER EXECUTION AND COMPLETION OF THE LIGHTING SYSTEM NOT INDICATED ON THE DRAWINGS NOR SPECIFIED SHALL BE PROVIDED AS IF THEY WERE SPECIFIED HERE OR INDICATED ON THE DRAWINGS.

3. EFFECTIVELY PROTECT ALL LIGHTING EQUIPMENT AGAINST DAMAGE FROM THE TIME OF FABRICATION TO FINAL ACCEPTANCE OF THE WORK. INSTALL REFLECTOR CONES, BAFFLES, APERTURE PLATES, LIGHT CONTROLLING ELEMENT FOR AIR HANDLING FIXTURES, AND DECORATIVE ELEMENTS AFTER COMPLETION OF CEILING TILES, PAINTING AND GENERAL CLEANUP. REPLACE BLEMISHED, DAMAGED OR UNSATISFACTORY FIXTURES AS DIRECTED.

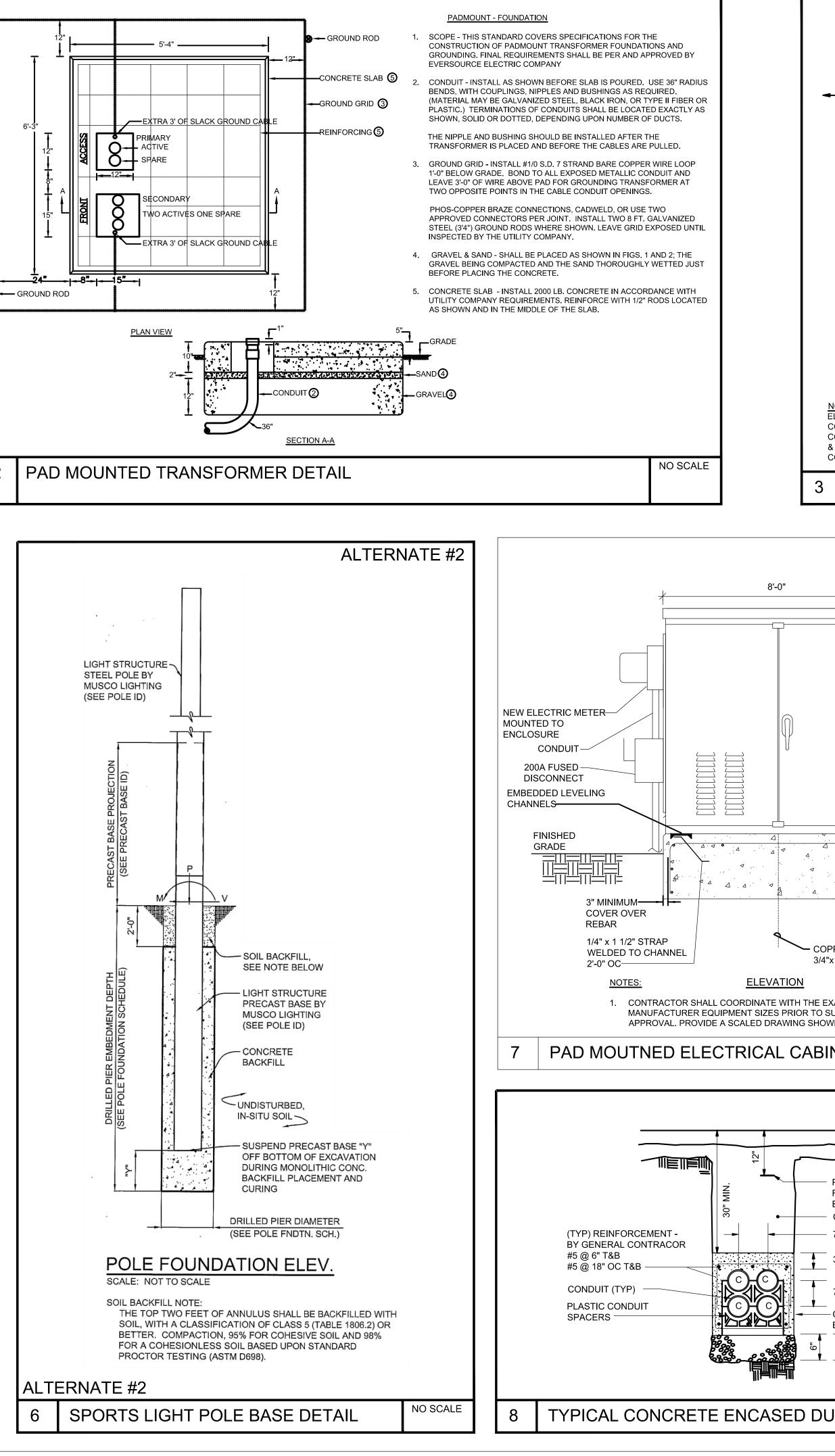
4. AT THE TIME OF FINAL ACCEPTANCE BY THE OWNER, ALL LIGHTING FIXTURES SHALL HAVE BEEN THOROUGHLY CLEANED WITH MATERIALS AND METHODS RECOMMENDED BY THE MANUFACTURERS, ALL BROKEN PARTS SHALL HAVE BEEN REPLACED, AND ALL LAMPS SHALL BE OPERATING.

Project:
TOWN OF NATICK, MA
UP-BIALIM COD
PLANS FOR THE IMPROVEMENTS TO EAST PARK 84/90 OAK ST NATICK, MA 01340
Weston & Sampson
427 Main Street, Suite 400, Worcester, MA (508) 698-3034 (800) Sampson w w w . w e s t o n a n d s a m p s o n . c o m
Consultants:
Revisions:
No. Date Description
Seal:
Issued For:
CONSTRUCTION DOCUMENTS
Scale: NTS
Date: 07/11/2018
Drawn By: ICA
Reviewed By: RFM Approved By: RFM
W&S Project No: 2160679
W&S File No:
Drawing Title: ELECTRICAL LEGEND AND NOTES
Sheet Number: E1.02



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2



ING CONDUCTOR TO POLE INSULATED GROUNDING BUSHINGS BONDED TO POLE (TYP) <u>3'-0"</u>	PROVIDE EYS	ROUNDING STUD S FITTING ON ALL ROM LIGHT POLES DN SITE LIGHTING PLAN	
CURB/ROAD EDGE SET BACK		LTS WITH LEVELING	PLANS F
SEE TABLE BELOW	<b>_</b>	E SITE PLAN (TYP) IMON FILL IN 12" LIFTS I 12" OC Y SPACED	427 Main S (508) 698-3 w w w . w e
UNDISTURBED EARTH 24" DIA NOTE: ELECTRICAL CONTRACTOR SHALL COORDINATE WITH THE GENERAL CONTRACTOR. ALL EXCAVATION, BACKFILL	NOTE: REFER TO SF FOR MATERIA POLE HEIGHT 10'-0" 20'-0"	PECIFICATIONS ALS DIMENSION "A" 4'-6" 4'-6"	Consulta
CONCRETE SHALL BE BY GENERAL	30'-0" 40'-0"	6'-6" 6'-6"	
TYPICAL LIGHT POLE BASE D	DETAIL	NO SCALE	
ACT CABINET SIZE WITH ALL UBMITTING THE CABINET FOR WING ALL EQUIPMENT.	PLAN	NO SCALE	Revisions No. Da
FINISHED GRADE		NO SCALE	Scale: Date: Drawn By Reviewed
<ul> <li>SUB BASE OF SURFACE</li> <li>POLYETHYLENE WARNING TAPE FULL LENGTH OF DUCT BANK - BY GENERAL CONTRACTOR COMMON FILL - BY GENERAL CONTRACTOR</li> <li>7.5" SPACING</li> <li>3" COVER ALL AROUND</li> <li>7.5" SPACING</li> </ul>			Approved W&S Pro W&S File Drawing
CONCRETE DUCT ENCASEMENT - BY GENERAL CONTRACTOR ] 3/4" SCREENED GRAVEL OR CRUSHED STONE BASE - BY GENERAL CONTRACTOR JCTBANK DETAIL NO SCALE			Sheet Nu

# SACHUSE FOR THE IMPROVEMENTS TO EAST PARK 84/90 OAK ST NATICK, MA 01340 on&Sampson Street, Suite 400, Worcester, MA 3034 (800) Sampson estonandsampson.com nts: Description CONSTRUCTION DOCUMENTS NTS 07/11/2018 ICA d By: RFM 너By: RFM ject No: 2160679 Title<sup>.</sup> TRICAL DETAILS umber: E1.03

roiect

- POLE WITH HANDHOLE AND

BOND CIRCUIT GROUND-

TOWN OF NATICK, MA

ATICK

## Town of Natick, Massachusetts



PROJECT MANUAL

# For Construction of: East School Park Site Improvements

July, 2018

Owner: Town of Natick Department of Parks and Recreation

Designer: **Weston & Sampson** 427 Main Street, Suite 400, Worcester, MA 1 (508) 698-3034 1 (800) 726-7766 www.westonandsampson.com



transform your environment

#### **TOWN OF NATICK**

#### IMPROVEMENTS TO EAST SCHOOL PARK NATICK, MA

# TABLE OF CONTENTSPART II - TECHNICAL SPECIFICATIONS

### SECTION NUMBER

Division 0 INVITATION TO BID / ADS INSTRUCTION TO BIDDERS SUBSURFACE INFORMATION BID FORM BID BOND NOTICE OF AWARD AGREEMENT PERFORMANCE BOND PAYMENT BOND SUPPLEMENTARY CONDITIONS PART 1 SUPPLEMENTARY CONDITIONS PART 2 NOTICE TO PROCEED PREVAILING WAGE FORM	$\begin{array}{c} 00100\\ 00200\\ 00320\\ 00410\\ 00411\\ 00412\\ 00520\\ 00610\\ 00615\\ 00800\\ 00810\\ 00900410 \end{array}$
Division 1 General Conditions SUMMARY OF WORK MEASURE AND PAYMENT ALLOWANCE CONTROL OF WORK AND MATERIALS PROJECT MEETINGS SUBMITTALS PERMITS QUALITY CONTROL SAMPLING AND TESTING TEMPORARY FACILITIES DUST CONTROL ENVIRONMENTAL PROTECTION PROJECT SIGN CONSTRUCTION LAYOUT PROJECT CLOSE OUT	$\begin{array}{c} 01010\\ 01025\\ 01031\\ 01040\\ 01200\\ 01330\\ 01350\\ 01400\\ 01450\\ 01500\\ 01562\\ 01570\\ 01580\\ 01600\\ 01700 \end{array}$
Division 2 Site Work GEOTEXTILE FABRIC DEMOLITION CLEARING AND GRUBBING TREE PRUNING AND TREE AND STUMP REMOVAL SELECTIVE INVASIVE SPECIES REMOVAL DEWATERING SUPPORT OF EXCAVATION SEEDING	02071 02220 02230 02235 02236 02240 02252 02290

EARTHWORK	02300
LOAM BORROW	02329
EROSION CONTROL	02370
RIP RAP	02371
TRACER TAPE	02518
DRAINAGE PIPE	02625
PRECAST MANHOLES	02631
REINFORCED CONCRETE PIPE	02633
DETENSION SYSTEM	02636
BITUMINOUS CONCRETE PAVING AND COLOR SEALCOAT	02746
STABILIZED STONEDUST	02750
PAVEMENT MARKINGS	02760
CURBING	02773
INFIELD MIX	02790
SITE IMPROVEMENTS	02800
SITE IMPROVEMENTS-SPORTS EQUIPMENT	02801
IRRIGATION	02810
PREFABRICATED ORNAMENTAL FENCE AND GATES	02820
TEMPORARY CHAIN LINK FENCE	02821
CHAIN LINK FENCE AND NETTING	02822
STEEL BARRIER GATE	02829
SEGMENTAL RETAINING WALL SYSTEM	02831
METAL BOLLARDS	02847
PLAY EQUIPMENT	02886
RUBBER SAFETY SURFACE	02880
ROOT ZONE MIX	02887
TREES, SHRUBS, GROUDCOVER	02911
IKEES, SHKUDS, GKUUDCUVEK	02930
Division 2	
Division 3 CONCRETE FORMWORKS	02100
	03100
CONCRETE REINFORCEMENT	03200
CAST IN PLACE CONCRETE	03300
INTEGRALLY COLORED CONCRETE	03360
Division 16 Electrical	1 < 0 1 0
GENERAL CONDITIONS	16010
BASIC ELECTRICAL MATERIALS AND METHODS	16050
BUILDING CONDUCTORS AND CABLES	16123
RACEWAY AND BOXES	16130
PANELBOARDS	16442
EAST PARK BASKETBALL AND TENNIS LED SPORTS LIGHTING	16526A

#### **INVITATION FOR BIDS**

Pursuant to the provisions of Chapter 30, Section 39M of the General Laws of the Commonwealth of Massachusetts (M.G.L. c. 30, §39M), the Town of Natick, the Awarding Authority, (hereinafter referred to as "Owner"), by the Natick Board of Selectmen of the Town of Natick, Massachusetts, invites sealed Bids for construction of a new East Park in Natick. Sealed Bids shall be received for the General Contract until July 26, 2018, at 11:00 A.M. local time, at the Natick DPW Building, 75 West Street, Natick, MA 01760, at which time and place they will be publicly opened, read and registered. No faxed or email, or conditional bids shall be accepted. If the Procurement Office within the DPW Building is closed due to weather or other emergency, the deadline for receipt of bids shall be extended until 11:00 A.M. local time on the next business day upon which the Procurement Office is open for business.

Each and every Bid shall be submitted on the Bid Form furnished with the Bidding Documents and shall be addressed to the Board of Selectmen. Each and every Bid shall be sealed in an envelope which is clearly marked in the lower left hand corner "<u>BID FOR EAST PARK</u> <u>CONSTRUCTION.</u>"

The Work for this project consists of construction of a new East Park in Natick. The Contractor shall supply all labor, materials and equipment necessary to complete the work shown on the Contract Drawings and hereinafter contained in the Specifications.

A voluntary Pre-Bid Conference will be held on July 18, 2018 @ 10:00 A.M at Natick Public Works, 75 West Street, Natick, MA 01760.

Bidding documents are available electronically by contacting the procurement office at <u>bleblanc@natickma.org</u>, beginning at 11:00 A.M. local time on Wednesday, July 11, 2018. They may be reviewed at the office of the Department of Public Works, 75 West Street, Natick, MA 01760, between the hours of 9:00 A.M. to 4:00 P.M. local time, Monday through Thursday, and 9:00 A.M. to 12:00 P.M. (noon) local time on Friday, beginning at 11:00 A.M. local time on Wednesday, July 11, 2018.

Complete instructions for filing Bids are included in the Instructions to Bidders. Every Bid shall be submitted in full accordance with those Instructions to Bidders. Bids shall be valid only when accompanied by all of the following: (1) a fully completed and properly executed "Bid Form for General Bid"; (2) Bid security in the amount of five percent (5%) of the amount bid, in a form as described in the Instructions to Bidders and made payable to the "Town of Natick Board of Selectmen."

Attention of the Bidder is called to the requirements for minimum prevailing wage rates to be paid under this Contract and the reporting associated thereto. Minimum prevailing wage rates are required as per M.G.L, c, 149, §§ 26 to 27D, inclusive. Minimum prevailing wage rates determined by the Commissioner are as contained in the Supplementary Conditions section of the Contract Documents.

Bids for this Contract are subject to the provisions of M.G.L. c. 30, §39M. The successful Bidder will be required to furnish a Payment and Performance Bond, with a surety company which is acceptable to Owner, each in the amount of one hundred percent (100%) full amount of the Contract. Contract payment will be by the unit price and lump sum price method as indicated on the <u>Bid</u> Form. No Bidder may withdraw his Bid for a period of thirty (30) days after the date designated above for the opening. The Owner reserves the right to reject any or all Bids or to accept any Bid deemed by it to be in the best interest of the Town of Natick, and, to the extent permitted by law, to limit the extent of the work to keep within the limits of available funds. The award of any Contract pursuant to this Invitation for Bids is subject to appropriation by Natick Town Meeting.

Bidder's attention is directed to the Non-Discrimination in Employment and Affirmative Action Program requirements of this Contract. The requirements of these programs are explained in the Instructions to Bidders and in Part I of the Supplementary Conditions of the Contract.

TOWN OF NATICK <u>Board of Selectmen</u> Amy K. Mistrot, Chairman Susan G. Salamoff, Vice Chairman Michael J. Hickey, Jr., Clerk Jonathan H. Freedman Richard P. Jennett, Jr. <u>Town Administrator</u> Melissa A. Malone <u>Director of Public Works</u> Jeremy Marsette, P.E. <u>WESTON & SAMPSON, ENGINEERS</u>

#### **INSTRUCTIONS TO BIDDERS**

#### **<u>1.</u> RECEIPT OF BIDS AND COPIES OF BID DOCUMENTS:**

1.1 In accordance with Massachusetts General Laws, Chapter 30, Section 39M, and all other applicable laws, Bids will be received by the Board of Selectmen of the Town of Natick (hereinafter known as the OWNER) at the office of the Procurement Officer, located in the DPW Building, 75 West Street, Natick, MA 01760, until July 26, 2018, at 11:00 A.M., local time, and then at said office be publicly opened and read aloud. The clock in the Procurement Office shall be considered official. No faxed, email, or conditional bids shall be accepted. If the Procurement Office within the DPW Building is closed due to weather or other emergency, the deadline for receipt of bids shall be extended until 11:00 A.M. local time on the next business day upon which the Procurement Office is open for business.

1.2 Each Bid shall be submitted in an opaque sealed envelope, addressed to the Board of Selectmen, and shall be delivered to the Procurement Office, DPW Building, 75 West Street, Natick, MA 01760. Each sealed envelope containing a Bid shall be plainly marked on the outside as "<u>Bid</u> for East Park Construction" and also shall bear the name of the Bidder, his address, his contact telephone number, and also his license number, if applicable. If forwarded by mail, the sealed envelope containing the Bid shall be enclosed in another envelope addressed to the Procurement Office, DPW Building, 75 West Street, Natick, MA 01760. The Bid Security shall be attached to the signature page of the <u>Bid</u>.

1.3 Submission of a Bid shall be conclusive evidence that the Bidder has examined the Premises and the Bid Documents and is familiar with all the conditions of the proposed Contract. Upon finding any omissions or discrepancy in this Invitation for Bids, the Bidder shall notify the Procurement Officer immediately so that any necessary addenda may be issued. Failure of the Bidder to investigate completely the Premises and/or to be thoroughly familiar with the Bid Documents shall in no way relieve any such Bidder from any obligation with respect to the Bid.

1.4 The Bid Documents, including Specifications and Drawings, may be reviewed at the Office of the Natick Department of Public Works, 75 West Street, Natick. MA 01760, between the hours of 8:00 A.M. to 4:00 P.M. local time, Monday through Thursday, and 9:00 A.M. to 12:00 P.M. (noon) local time on Friday, beginning at 11:00 A.M. local time on July 11, 2018.

1.5 Complete sets of the Bid Documents may be obtained from the Procurement Office, Natick Public Works, 75 West Street, Natick, MA, via <u>bleblanc@natickma.org</u>, during normal business hours, beginning on Wednesday, <u>July 11, 2018</u>, between 8:00 A.M. and 4:00 P.M. M-R, 8-12 Friday, local time

#### 1.6 DELETED.

1.7 CONTRACTOR may request to download bid documents for free by contacting the Engineer

1.8 Complete sets of Bid Documents shall be used in preparing Bids; neither OWNER nor ENGINEER assumes any responsibility for errors or misinterpretations resulting from the use of incomplete sets of Bid Documents.

1.9 OWNER and ENGINEER, in making copies of Bid Documents available on the above terms, do so only for the purpose of obtaining Bids on the Work and do not confer a license or grant for any other use.

1.10 Voluntary pre-bid meeting will be held on <u>July 18, 2018</u> at 10:00 A.M., at Natick Public Works, 75 West Street, Natick, MA 01760.

## 2. SCOPE OF WORK/LOCATION OF WORK:

2.1 The Work for this project consists of constructing a new East Park in Natick. The Contractor shall supply all labor, materials and equipment necessary to complete the work shown on the Contract Drawings and hereinafter contained in the Specifications.

#### 2.2 DELETED.

2.3 The Work includes the furnishing of all labor, materials and equipment for completing the work as shown on the Contract Drawings and as herein specified or reasonably implied.

2.4 To the extent permitted by law, the OWNER reserves the right to eliminate certain sections of the Work as may be determined by it as a basis of award, to keep within the limits of available funds, or to add sections of the work previously eliminated.

#### 3. SCHEDULING:

3.1 The Contract time will start on the date indicated on the Notice to Proceed and the Successful Bidder shall proceed on a continuous basis following Contract start date until all work is complete, unless directed differently by the OWNER.

3.2 The Town will award a separate contract for the replacement of the Bradford Road sewage pump station superstructure. The pumping equipment will not be impacted by the project. Contractor working under this contract will be required to coordinate work with the pump station project Contractor, to insure the pump station Contractor has full access to the pump station site from Bradford Road.

#### 4. FORM OF BID:

4.1 All Bids shall be made on the blank form included in Section 00300 which follows this notice, and each Bid shall state a price for each lump sum item. The total of the item prices when correctly calculated, shall be used in the comparison of Bids received. In the event there is a discrepancy in the Bid between the prices written in words and figures, the prices written in words shall govern.

4.2 The form of <u>Bid</u> shall not be changed, and it shall be signed by the Bidder with his business address and place of residence.

4.3 A conditional or qualified Bid shall not be accepted.

#### 5. **BID SECURITY:**

5.1 Each Bid shall be accompanied by a Bid Bond written by a surety company qualified to do business in Massachusetts, or by Cash, or a Certified Check, or Treasurer's or Cashier's Check issued by a responsible bank or trust company, as Bid Security, in the amount of five (5%) percent of the total Bid, made payable to the Town of Natick.

5.2 The Bid Security of Bidders, except those of the three lowest responsible and eligible Bidders, shall be returned within five (5) days, Saturdays, Sundays and holidays excluded, after opening of Bids. The Bid Security of said three lowest Bidders shall be returned upon execution of the Contract.

5.3 In case the Successful Bidder shall fail or neglect to execute the Contract and furnish the satisfactory bonds within the time specified, the OWNER may determine that the Bidder has abandoned the Contract and thereupon the Bid Security accompanying the <u>Bid</u> shall be forfeited to the OWNER as liquidated damages for such failure or neglect, and to indemnify said OWNER for any loss which may be sustained by failure of the Bidder to execute the Contract and furnish the bonds as aforesaid, provided that, in case of death, disability, or other unforeseen circumstances affecting the Bidder, such Bid Security may be returned to him. After execution of the Contract and acceptance of the bonds by the OWNER, the Bid Security accompanying the <u>Bid</u> of the Successful Bidder will be returned.

#### 6. WITHDRAWAL OF BIDS:

6.1 Once Bid is submitted and received by the OWNER for consideration and comparison with other Bids similarly submitted, the Bidder agrees that he may not and shall not withdraw said Bid within a period of thirty (30) days (Saturdays, Sundays and legal holidays excluded).

6.2 Upon proper request and identification, Bids may be withdrawn only as follows:

1. At any time prior to the designated time for the opening of Bids.

2. Provided the Bid has not theretofore been accepted by the OWNER, at any time subsequent to the expiration of the period during which the Bidder has agreed not to withdraw his Bid.

6.3 Unless a Bid is withdrawn as provided above, each Bidder shall agree that it shall be deemed open for acceptance until the Contract has been executed by both parties thereto, or until the OWNER notifies a Bidder in writing that his Bid is rejected, or that the OWNER does not intend to accept it, or returns his Bid deposit. Notice of acceptance of a Bid shall not constitute rejection of any other Bid.

## 7. EXPERIENCE OF BIDDER:

7.1 Only Bids from CONTRACTORS experienced in installation sewage pump stations and gravity and pressure sewage collection piping systems, or utilization of experienced subcontractors will be favorably considered by the OWNER, and each Bidder shall include in the space provided in the <u>Bid</u>, evidence of such experience with satisfactory references, and shall provide on request, information as to organization and equipment available to him for the performance of the work under this Contract.

7.2 For the purposes of this Contract, experienced Contractor shall mean the Contractor and their Subcontractors have a minimum of five (5) successful years of experience in installation of water mains and gate valves.

7.3 No award will be made to any Bidder who cannot satisfy the OWNER that it has sufficient ability and experience in this class of work and sufficient capital and plant to enable it to prosecute and complete the work successfully within the time named. The OWNER'S decision of judgment on these matters shall be final, conclusive and binding.

## 8. QUESTIONS REGARDING DRAWINGS AND DOCUMENTS:

8.1 In general, no answer will be given to prospective Bidders in reply to an oral question if the question involves an interpretation of the intent or meaning of the Drawings or other Contract Documents, or the equality or use of products or methods other than those designated or described on the Drawings or in the Specifications. Any information given to Bidders other than by means of the Drawings and other Contract Documents, including Addenda, as described below, is given informally, for information and the convenience of the Bidder only and is not guaranteed. Each Bidder agrees that such information shall not be used as the basis of, nor shall the giving of any such information entitle the Bidder to assert, any claim or demand against the OWNER or the ENGINEER or account thereof.

8.2 To receive consideration, such questions shall be submitted in writing to the OWNER, with a copy to the ENGINEER, at least four (4) days before the established date for receipt of Bids. If the question involves the equality of use of products or methods, it shall be accompanied by Drawings, Specifications, or other data in sufficient detail to enable the ENGINEER to determine the equality or suitability of the product or method. In general, the ENGINEER will neither approve nor disapprove particular products prior to the opening of Bids. Such products will be considered when offered by the CONTRACTOR for incorporation into the work.

8.3 The ENGINEER will set forth as Addenda, which shall become part of the Contract Documents, such questions received as above provided as in his sole judgment are appropriate or necessary and his decision regarding each. At least two (2) days prior to the receipt of Bids, he will send a copy of these Addenda to those prospective Bidders known to have taken out sets of the Drawings and other Contract Documents.

8.4 Addenda notification will be distributed by email to all parties recorded by the Engineer as having received bidding documents. The prospective bidders will download addendums from the Engineer's website. Alternative methods of distributing addendum must be requested by the party recorded as receiving bidding documents. Each Bidder shall be responsible for determining that it has received all Addenda, which have been issued. If an Addendum notification is issued by email, ENGINEER will request a return email to verify receipt of the Addendum, however, failure by any Bidder or prospective Bidder to send a return email will not invalidate the delivery of the Addendum notification.

8.5 Each Bidder agrees to use the products and methods designated or described in the Specifications as amended by the Addenda.

8.6 It shall each Bidder's responsibility to confirm the existence of Addenda with the ENGINEER prior to submittal of Bid.

## 9. INFORMATION NOT GUARANTEED:

9.1 It is agreed and understood that no Bidder or CONTRACTOR shall use or be entitled to use, any of the information made available to him or obtained in any examination made by him in any manner as a basis of or ground for any claim or demand against the OWNER or the ENGINEER, arising from or by reason of any variance which may exist between the information made available and the actual subsurface or other conditions, natural phenomena, existing pipes, or other structures actually encountered during the construction work, except as may otherwise be expressly provided for in the Contract Documents.

9.2 All information given on the Drawings or in the other Contract Documents relating to subsurface and other conditions, natural phenomena, existing pipes, and other structures, is from the best sources at present available to the OWNER. All such information is furnished only for the information and convenience of Bidders and is not guaranteed.

9.3 It is further agreed and understood that OWNER does not warrant or guarantee that the subsurface or other conditions, natural phenomena, existing pipes, or other structures encountered during construction will be the same as those indicated on the Contract Drawings, or in the other Contract Documents.

#### **10. BIDDER RESPONSIBILITY**:

10.1 If a Bidder, after examining the site and Contract Documents, determines the presence of a discrepancy between the Contract Drawings and Contract Specifications, it is each Bidder's responsibility to notify the ENGINEER prior to the Bid opening. ENGINEER shall review and issue an Addendum if necessary. If a Bidder fails to notify ENGINEER of such discrepancy and is awarded the Contract, the CONTRACTOR shall not be entitled to a Contract price adjustment if OWNER or ENGINEER determines CONTRACTOR was aware of the discrepancy during the Bid period.

10.2 Each Bidder is responsible for inspecting the site and for reading and being thoroughly familiar with the Contract Documents. The failure or omission of any Bidder to do any of the foregoing shall in no way relieve any Bidder from any obligation in respect to his Bid.

10.3 The Contract Documents contain the provisions required for the construction of the project. Information obtained from an officer, agent, or employee of the OWNER or any other person shall not affect the risks or obligations assumed by each Bidder or relieve him from fulfilling any of the conditions of the Contract.

10.4 It is the CONTRACTOR'S responsibility to visit each known site in order to identify any limitations in access to each site. The OWNER will not be responsible for any claims for additional cost during construction that are related to access to each known site.

10.5 Each Bidder assumes all responsibility for the Bid arriving on time and at the designated location. The time of receipt of a Bid shall determine the acceptability of mailed Bids, regardless of postmark. It shall be the sole responsibility of the Bidder to assure that a Bid has arrived before the time for opening of Bids as specified in the Invitation for Bids and Instructions to Bidders. Bids received at the specified location and <u>after</u> the time specified will <u>not</u> be accepted.

## **<u>11.</u>** COMPARISON OF BIDS:

11.1 All Bids will be compared on the basis of the estimate of quantities of work to be done, per unit price and/or lump sum items, as tabulated in the <u>Bid</u>. Estimated quantities are approximate only, being given for the uniform comparison of Bids. The OWNER does not expressly agree, or by implication agree, that the actual amount of work will correspond therewith, and the right is expressly reserved, to increase or diminish the amount of any class or portion of the work, or to omit construction in certain locations, as may be deemed necessary by the OWNER to keep within the limits of available funds, as permitted by applicable law.

## **12. RIGHTS RESERVED BY OWNER:**

12.1 The OWNER reserves the right to reject any or all Bids, or to waive any informalities or minor defects, if deemed by it to be in the best interest of the Town of Natick.

12.2 The OWNER may make such investigations as it deems necessary to determine the ability of each Bidder to perform the work, and the Bidder shall furnish to the OWNER all such information and data for this purpose as the OWNER may request. The OWNER reserves the right to reject any Bid if the evidence submitted by, or investigation of such Bidder fails to satisfy the OWNER that such Bidder is properly qualified to carry out the obligations of the Agreement and to complete the work contemplated therein.

12.3 The low Bidder shall supply the names and addresses of suppliers and subcontractors when requested to do so by the OWNER.

12.4 The Town may terminate the Contract upon written notice to the CONTRACTOR if a source of money to fund the Contract is not available during any year of the Contract term. In the alternative, the parties may agree in writing to amend the Contract to provide for a Contract price which represents the reduced appropriation for a contract year.

#### **13. AWARD OF CONTRACT:**

Award of the Contract will be made to the lowest responsible and eligible Bidder. The 131 term "lowest responsible and eligible bidder" shall mean the bidder: (1) whose bid is the lowest of those bidders possessing the skill, ability and integrity necessary for the faithful performance of the work; (2) who shall certify, that he is able to furnish labor that can work in harmony with all other elements of labor employed or to be employed in the work; (3) who shall certify that all employees to be employed at the worksite will have successfully completed a course in construction safety and health approved by the United States Occupational Safety and Health Administration that is at least ten (10) hours in duration at the time the employee begins work and who shall furnish documentation of successful completion of said course with the first certified payroll report for each employee; (4) who, where the provisions of section 8B of chapter 29 apply, shall have been determined to be qualified thereunder, and (5) who obtains within ten (10) days of the notification of contract award the security by bond required under section 29 of chapter 149; provided that for the purposes of this section the term "security by bond" shall mean the bond of a surety company qualified to do business under the laws of the commonwealth and satisfactory to the awarding authority; provided further that if there is more than one (1) surety company, the surety companies shall be jointly and severally liable. The party to whom the CONTRACT is awarded will be required to execute the Contract, obtain Payment and Performance Bonds, Insurance Certificates and Certification Form, and a Certificate of Vote of authorization of signature on Documents, within ten (10) calendar days from receipt of Notice of Award. The Notice of Award shall be accompanied by the necessary Agreement and Bid Forms. In case of failure of a Bidder to execute the Contract and provide the above mentioned Bonds, Certificates, etc., the OWNER may at its option, consider the Bidder in default, in which case the Bid security accompanying the Bid shall become property of the OWNER.

#### **14. PAYMENT AND PERFORMANCE BONDS:**

14.1 A Performance Bond and a Payment Bond, each in the amount of <u>one hundred percent</u> (100%) of the Contract price, with a corporate surety approved by the OWNER will be required for the faithful performance of the Contract.

14.2 Attorneys-in-fact who sign Bid Bonds or Payment Bond and Performance Bond, shall file with each Bond, a certified and effective dated copy of their Power of Attorney.

#### **15. CONTRACT INSURANCE:**

15.1 The Successful Bidder shall provide Commercial General Liability Insurance, Automotive Liability Insurance, Worker's Compensation and Employer's Liability Insurance, including other coverages such as indicated in the General Conditions and as amended in the Supplementary Conditions.

15.2 Each certificate and policy of insurance required by the Contract shall contain a cancellation provision as indicated below with no variations.

"Should any of the above described policies be cancelled or materially amended before the expiration date thereof, the issuing insurer or the Contractor will mail within thirty (30) days prior written notice to the certificate holder named to the left". 15.3 The Successful Bidder shall provide an endorsement or endorsements which indicate that the Town of Natick is named as an additional insured on the required policies of Commercial General Liability Insurance, Automobile Liability Insurance, and Excess Liability Insurance, Umbrella Form and maintain throughout the term of the Contract and any extension or renewal thereof.

15.4 The Successful Bidder shall provide separate Owner's Protective Liability Insurance, with the OWNER and ENGINEER only as insured. A rider clause to the Contractor's Liability Insurance shall not be acceptable.

#### **16. INDEMNIFICATION:**

16.1 The Successful Bidder shall assume the indemnification responsibilities set forth in the Contract which is included in the Bid Documents and is incorporated herein by reference.

#### **17.** CONTRACT SIGNING AND NOTICE TO PROCEED:

17.1 The Notice to Proceed shall be issued within thirty (30) days of the effective date of the Contract by the OWNER. Should there be reasons why the Notice to Proceed cannot be issued within such period, the time may be extended by mutual agreement between the OWNER and the Successful Bidder. If the Notice to Proceed has not been issued within the thirty (30) day period, or within the period mutually agreed upon, the Successful Bidder may terminate the Contract without further liability on the part of either party.

#### **<u>18. TIME OF STARTING:</u>**

18.1 The work shall start on the date to be placed on the Notice to Proceed, and proceed on a continuous basis until complete, unless directed differently by OWNER.

#### **19. TIME OF COMPLETION AND LIQUIDATED DAMAGES:**

19.1 The date for commencing Contract time will be the day to be indicated on the Notice to Proceed.

19.2 It is the intention of this Contract to complete the work, in operating condition as soon as practicable, but not later than July 15, 2019.

#### 19.3 DELETED.

19.4 It is the intention of the Contract to require the CONTRACTOR to commence work and to continue working on a continuous basis until complete.

#### **20. LAWS AND REGULATIONS:**

20.1 Each Bidder's attention is directed to the fact that all applicable Local, State and Federal laws, municipal ordinances, and the rules and regulations of all authorities having jurisdiction over construction of the Project shall apply to the Contract throughout, and they will be deemed to be included in the Contract, the same as though herein written in full.

20.2 Notwithstanding the foregoing, the Contract is subject to the applicable provisions of, but not limited to, M.G.L. c. 30, §39M, which is incorporated herein by reference.

20.3 Notwithstanding the foregoing, the Contract is also subject to the dig-safe requirements of M.G.L. c. 82, § 40 and the applicable portions of 527 CMR 13, relating to Blasting.

## 21. CONTRACT DRAWINGS:

21.1 The construction project is as shown on the Contract Drawings entitled "Pamela and Bradford Sewage Pump Station Force Main Replacement" prepared by the Engineer.

## **22. UNBALANCED BIDS**:

22.1 A Bidder shall not submit unbalanced prices for any of the Bid items on the <u>Bid</u>. All prices shall be reasonable for the Work entailed. The OWNER reserves the right to reject any Bid which contains unbalanced prices, considering such a Bid as non-responsive to the Instructions to Bidders, and to consider same as reason for rejecting a Bid.

22.2 Certain Bid items may have set minimum and/or maximum prices to provide uniformity in the comparison of Bids established by OWNER and indicated on the <u>Bid</u> form. Bids submitted not in compliance with these established amounts, may be rejected for non-compliance with the Instructions to Bidders.

## 23. SAFETY AND HEALTH REGULATIONS:

23.1 This project is subject to the Safety and Health Regulations of the U.S. Department of Labor set forth in Title 29 CFR Part 1926 and to all subsequent amendments, and to the Massachusetts Department of Labor and Workforce Development, Division of Industrial Safety "Rules and Regulations for the Prevention of Accidents in Construction Operations" (Chapter 454 CMR 10.00 et seq.). CONTRACTORS shall be familiar with the requirements of these regulations.

23.2 Each Bidder shall certify that it is able to furnish labor that can work in harmony with all other elements of labor employed or to be employed on the work; that all employees to be employed at the worksite shall have successfully completed a course in construction safety and health approved by the United States Occupational Safety and Health Administration that is at least ten (10) hours in duration at the time the employee begins work and who shall furnish documentation of successful completion of said course with the first certified payroll report for each employee; and that he shall comply fully with all laws and regulations applicable to awards made subject to section 44A.

#### 24. SALES TAX EXEMPTION:

24.1 The OWNER will provide a Massachusetts Sales Tax Blanket Exemption Certificate No. applicable to all materials to be furnished under this Contract.

24.2 Except as noted above, the Successful Bidder and Subcontractors shall pay all taxes levied by law on materials, labor or services furnished by them. Payments of such levies and sales taxes will be held to be included in Contract amounts.

#### 25. PERMITS AND LICENSES:

25.1 All permits for work within the project limits shall be obtained and paid for by the Successful Bidder.

#### 26. MINIMUM PREVAILING WAGE RATES:

26.1 Minimum Prevailing Wage Rates (Heavy Construction) as determined by the Commissioner of the Department of Labor and Workforce Development under the provisions of the Massachusetts General Laws, Chapter 149, Sections 26 to 27D, as amended, (the Prevailing Wage Act) apply to this project. It is the responsibility of the CONTRACTOR, before Bid opening, to request if necessary, any additional information on Minimum Prevailing Wage Rates for those tradespeople who are not covered by the following schedule of prevailing wage rates, but who may be employed for the proposed work under this Contract.

26.2 Minimum prevailing wage rates to be used for this Contract are contained in Part I of the Supplementary Conditions.

26.3 Regulations for the Prevailing Wage Act state that payment of compensation to workmen for work performed on public work on a lump sum basis, piece work system, or a price certain for the completion of a certain amount of work, or the production of a certain result shall be deemed a violation of the Act regardless of the average hourly earning resulting therefrom. This shall result in the disqualification of any Contractor employing these methods.

26.4 The CONTRACTOR shall submit weekly payrolls to the OWNER during the progress of this Contract for each day work is performed.

#### 27. WARRANTIES:

27.1 The Successful Bidder, if selected as the CONTRACTOR, shall furnish all supplies, equipment, and labor necessary for the performance of the services and/or delivery of equipment required by this Contract and warrants that it has in its employ, and throughout the term of this Contract or any extension or renewal thereof, shall continue to have a sufficient number of persons experienced in performing services required by this Contract, such that the CONTRACTOR'S obligations under this Contract shall be carried out in a prompt, safe and professional manner.

27.2 The Successful Bidder, if selected as the CONTRACTOR, shall further warrant that it shall perform services under this Contract with the highest degree of professionalism and care. Any equipment delivered, unless otherwise agreed by the parties, shall be of generally merchantable quality and shall be fit for the purpose sought by the OWNER.

27.3 The Successful Bidder, if selected as the CONTRACTOR, shall warrant to the OWNER that the work to be performed under the Contract shall be free from defects in material and workmanship for twelve (12) months after acceptance of the work by the OWNER. If any defects in material or workmanship regarding the work occur within said twelve (12) month period, the CONTRACTOR shall have the option of repairing or replacing the defective component(s) involved in the work. If part of the work is accepted in accordance with that subsection of the Contract titled Partial Acceptance, the warranty for that part of the work shall be for a period of one (1) year from the date fixed for such acceptance.

## **28. NONDISCRIMINATION IN EMPLOYMENT:**

28.1 Contracts for work under this <u>Bid</u> shall obligate the CONTRACTOR and subcontractors not to discriminate in employment practices.

28.2 Contracts for work under this project shall obligate the CONTRACTOR and Subcontractors not to discriminate in employment practices, and shall maintain not less than five percent (5%) ratio of minority employees man hours to total man hours.

28.3 In connection with the performance of work under this Contract, the CONTRACTOR shall not discriminate against any employees or applicant for employment because of race, color, religious creed, national origin, age, sex, gender identity, sexual orientation (which shall not include persons whose sexual orientation involves minor children as the sex object), genetic information, ancestry, children, marital status, veteran status or membership in the armed services, the receiving of public assistance, and handicap. The aforesaid provision shall include, but not be limited to the following: advertising; recruitment; hiring; rates of pay or other forms of compensation; terms, conditions or privileges of employment; employment upgrading; transfer; demotion; layoff; and termination. The CONTRACTOR shall post hereafter in conspicuous places, available for employees and applicants for employment notices to be provided by the applicable agent of the Commonwealth of Massachusetts setting forth the provisions of the Fair Employment Practices Law of the Commonwealth. The CONTRACTOR shall also undertake in good faith, affirmative action measures designed to eliminate any discriminatory barriers in the terms and conditions of employment on the grounds of race, color, religious creed, national origin, age, sex, gender identity, sexual orientation (which shall not include persons whose sexual orientation involves minor children as the sex object), genetic information, ancestry, children, marital status, veteran status or membership in the armed services, the receiving of public assistance, and handicap and to eliminate and remedy any effects of such discrimination in the past.

28.4 The Successful Bidder shall submit a Contractor's Certification Form and a Subcontractor's Certification Form concerning their employment practices and policies in order to maintain their eligibility to receive the Award of the Contract. These forms shall be submitted with the signed Contract Documents.

## 29. SUBSTITUTE OR "OR-EQUAL" ITEMS

29.1 The Contract, if awarded, will be on the basis of materials and equipment described in the Drawings or specified in the Specifications. Whenever it is indicated in the Drawings or specified in the Specifications that a substitute or "or equal" item of material or equipment may be furnished or used by CONTRACTOR if acceptable to ENGINEER, application for such acceptance will not be considered by ENGINEER until after the Effective Date of the Agreement; all consideration shall comply with M.G.L. c. 30, §39M(b).

## 30. PRICE ADJUSTMENTS FOR SPECIFIC MATERIALS

30.1 NOT APPLICABLE. NO ROAD/BRIDGE PROJECT IS IMPLICATED.

### SECTION 00320 SUBSURFACE INFORMATION

### PART I - GENERAL:

### 1.01 SCOPE:

A. A subsurface exploration program consisting of soil borings and test pits has been performed, with reasonable care. The boring logs, test pit logs, and exploration location plans are appended hereto as Appendix B of the Contract Documents.

Samples of the materials encountered may be seen upon request during the bidding period only at the office of Weston & Sampson Engineers, Inc., 5 Centennial Drive, Peabody, Massachusetts. If Contractors deem the subsurface information insufficient, they may, after obtaining Owner's permission, carry out additional subsurface explorations, at no expense to the Owner.

- B. Subsurface information provided in the Contract Documents is limited by the methods used for obtaining and expressing such data and is subject to various interpretations. The terms used to describe soils, rock, groundwater and such other conditions are subject to local usage and individual interpretation.
- C. Borings and test pits have been completed substantially at the locations indicated on the drawings and advanced to the depths shown on the logs. Soil information presented in the logs, as to classification, gradation, properties, density and consistency, is based on visual observation of recovered samples. Groundwater levels reported on the logs are those measured in the field at the particular location and at the time measurements were made, and do not necessarily represent permanent groundwater elevations. Groundwater elevations may be affected by temperature, rainfall, tidal fluctuation, and other factors that may not have been present at the time the measurements were made. The Contractors should be aware that groundwater level fluctuations may affect methods of construction.
- D. Subsurface exploration, soil and rock data are for the general information of the Contractors. The Contractors are obligated to examine the site, review boring and test pit logs, all available information and records of explorations, investigations and other pertinent data for the site, and then based upon their own interpretations and investigations decide the character of material to be encountered and excavated, the suitability of the materials to be used for backfilling and such other purposes, the groundwater conditions, difficulties or obstacles likely to be encountered, and other conditions affecting the work. The subsurface data is accurate only at the particular locations and times the subsurface explorations were made. No other warranty either expressed or implied by the Owner, Engineer or their agents is made as to the accuracy of the subsurface information and data shown on the drawings or presented in the Contract Documents.

## END OF SECTION

The undersigned, as Bidder, declares that all persons or parties interested in this Bid as principals are named herein; that this Bid is bona fide, fair, and made without collusion or fraud with any person (As used in this section, the word "person" shall mean any natural person, business, joint ventures, partnership, corporation, union, committee, club, or other organization, entity or group of individuals.); that he has carefully examined the location of the proposed Work and has, read the Contract Documents; that he shall agree to contract with the Town of Natick, in the form of a Contract to be deposited with the Owner, to provide all necessary machinery, tools, apparatus and other means of construction, and to do all the work and furnish the materials and labor, specified in the Contract, in the manner and time therein prescribed, and according to the requirements of the OWNER, as therein set forth; and that he shall take in full payment therefor, the amounts resulting from the unit and/or lump sum prices which he bids in the following tabulation, when multiplied by the quantities of Work actually accomplished.

Bidder hereby agrees to commence Work under this Contract on or before the date to be indicated on the Notice to Proceed and will be completed in operating condition as soon as practicable, but no later than the time specified in the Bid Documents thereafter, unless an extension of time is granted.

Bidder acknowledges receipt of Addenda:

#1\_\_\_\_\_ #2\_\_\_\_\_ #3\_\_\_\_\_

For all Work presented in the Bid Documents, Bidder submits the following Bid:

## BID FORM

ITEM <u>NO.</u>	DESCRIPTION			<u>AMOUNT</u>
1.	For the total lump sum price of			
			=	\$
	(Lump Sum Price in Words)			
2.	For well drilling and all equipment, the allowance price of Seventy Thousand Dollars and Zero Cents		=	\$_35,000
	(Unit Price in Figures)			*
	TOTAL BID PRICE FOR BASE BID COMPARISON (Total of contractor lump sum plus allowance)			
			=	\$
	(Contract Base Bid Price in Words)			
ADDI	FONAL ADD ITEMS			
1	. For Tennis Court Shade Shelter to include the Shelter, for lump sum price of:	otings and co	ncrete p	ad, the total
			=	\$
	(Lump Sum Price in Words)			
2	. For Sports Court Lighting, including poles, fixtures, comprise of:	trols and wirin	ng, the t	otal lump sum
			=	\$
	(Lump Sum Price in Words)			
3	. For Wooded Area Pathways, including site preparation, and concrete pads, the total lump sum price of:	crushed aggre	gate pat	hways, benches
			=	\$
	(Lump Sum Price in Words)			

The Town will award the project based upon available funding. If funding is available beyond the base bid amount the Town will review each Additional Add Item in no particular order to determine which items can be included in the project award while staying within available funding. Bids will be compared based on base bid plus each or multiple or all Additional Add items to determine the low bidder.

An unbalanced or unreasonable lump sum or unit price submitted herein may be grounds for rejection of the Bid.

Specific items of this Contract may be eliminated or reduced in quantity to keep within limits of available funding, at the OWNER'S option.

<u>STATEMENT OF EXPERIENCE</u>: The undersigned as Bidder declares that he has successfully accomplished similar work in the following places:

1. Description of Project \_\_\_\_\_

(Include type of project, total value of Contract, date of

completion, etc.)

Owner & Contact Person

(Names, Addresses and Telephone Nos.)

Engineer & Contact Person

2. Description of Project

(Include type of project, total value of Contract, date of

completion, etc.)

Owner & Contact Person \_\_\_\_\_

(Names, Addresses and Telephone Nos.)

Engineer & Contact Person

3. Description of Project

completion, etc.)	
Owner & Contact Person	(Names, Addresses and Telephone Nos.)
	(manies, Addresses and Telephone Nos.)
Engineer & Contact Person	
4. Description of Project	(Include type of project, total value of Contract, date of
	(include type of project, total value of Contract, date of
completion, etc.)	
Owner & Contact Person	
	(Names, Addresses and Telephone Nos.)
Engineer & Contact Person	
5. Description of Project	
	(Include type of project, total value of Contract, date of
of completion, etc.)	
Owner & Contact Person	
	(Names, Addresses and Telephone Nos.)
Engineer & Contact Person	
NOTE: Bidders may	attach supplementary information, if necessary, to indicate the expe

NOTE: Bidders may attach supplementary information, if necessary, to indicate the experience, organization and equipment available to undertake the Work in the event of an award of the Contract.

Each Bid shall be accompanied by a <u>Bid Deposit in the form of a Bid Bond, or cash, or a</u> <u>certified check on, or a treasurer's or cashier's check issued by, a responsible bank or trust company,</u> <u>payable to the awarding authority. The amount of such Bid Deposit shall be five percent (5%) of the value</u> <u>of the Bid.</u> No Bidder may withdraw his Bid for a period of thirty (30) days after the date of Bid opening, excluding Saturdays, Sundays and holidays.

A Performance Bond and a Payment Bond, each in the amount of one hundred percent (100 %) of the Contract Price, with a corporate surety approved by the OWNER, shall be required for the faithful performance of the Contract.

BIDDER: The full name and residence of all persons and parties interested in this Bid as principals, is as follows:

This Bid shall bear the written signature of the Bidder or his authorized agent. If the Bidder is a corporation or a partnership, the Bid shall be signed by a duly authorized officer of such corporation or by a partner, and the title of such officer shall be stated. The Certificate as to Corporate Bidder Form shall be completed following this page.

The undersigned Bidder hereby certifies he/she shall comply with the minority workforce percentage ratio and specific affirmative action steps contained in the Non-Discrimination in Workforce provisions of this Contract provisions. The Contractor receiving the award of the Contract shall be required to obtain from each of its subcontractors a copy of the certification by said subcontractor, regardless of tier, that it shall comply with the minority workforce ratio and specific affirmative action steps contained in these contract provisions and submit it to the contracting agency prior to the award of such subcontract.

The undersigned, as Bidder, hereby certifies that he is aware of the applicable requirements of the Williams-Steiger Occupational Safety and Health Act of 1970 (O.S.H.A.), and all latest revisions thereto, and that this Bid is prepared on the basis of compliance with those requirements.

The undersigned, as Bidder, hereby certifies that he is able to furnish labor that can work in harmony with all other elements of labor employed or to be employed on the work. The undersigned, as Bidder, hereby certifies that all employees to be employed at the worksite shall have successfully completed a course in construction safety and health approved by the United States Occupational Safety and Health Administration that is at least ten (10) hours in duration at the time the employees begin work. The undersigned, as Bidder, hereby certifies that if it is selected as Contractor, it shall furnish documentation of successful completion of said course with the first certified payroll report for each employee. The undersigned, as Bidder, hereby certifies that he is currently in compliance with the provisions of Massachusetts General Laws, Chapter 151B, which governs nondiscrimination in employment.

The undersigned certifies under penalties of perjury that this Bid, in all respects is bona fide, fair, and has been made and submitted in good faith and without collusion or fraud with any other person. As used in this certification, the word "person" shall mean any natural person, business, joint ventures, partnership, corporation, union, committee, club, or other organization, entity or group of individuals.

The undersigned, as Bidder, hereby certifies that he shall maintain records in reasonable detail which accurately and fairly reflect the financial transactions and disposition of the Bidder, in accordance with M.G.L. Chapter 30, Section 39R.

THIS BID SUBMITTED ON	 20

By\_\_\_\_

Signature

Printed Name

Printed Title

By\_\_\_\_

(Corporation Name)

(State of Incorporation)

(Corporate Seal)

Attest \_\_\_\_\_\_(Secretary)

Business Address:

Telephone Number: (	Email Address:

Fax Number: (	)

## CERTIFICATE OF NON-COLLUSION

The undersigned certifies under penalties of perjury that this Bid, in all respects is bona fide, fair, and has been made and submitted in good faith and without collusion or fraud with any other person. As used in this certification, the word "person" shall mean any natural person, business, joint ventures, partnership, corporation, union, committee, club, or other organization, entity or group of individuals.

Name of Bidder

Address of Bidder

By:

Signature

Printed Name

Printed Title

## TAX COMPLIANCE CERTIFICATION

Pursuant to M.G.L. c.62C, Section 49A, the undersigned hereby certifies under penalty of perjury has complied with all laws of the Commonwealth of Massachusetts relating to the payment of taxes, to the reporting of employees and contractors, and to the withholding and remitting of child support.

Name of Bidder

Address of Bidder

By:

Signature

Printed Name

Printed Title

## CONFLICT OF INTEREST CERTIFICATION

The Bidder named below hereby certifies that:

- 1. The Bidder has not given, offered, or agreed to give any gift, contribution, or, offer of employment as an inducement for, or in connection with, the award of a contract for these services.
- 2. No consultant to, or, subcontractor for the Bidder has given, offered, or agreed to give any gift, contribution, or, offer of employment to the Bidder, or, to any other person, corporation, or entity as an inducement for, or, in connection with, the award to the consultant or subcontractor of a contract by the Bidder.
- 3. No person, corporation, or, other entity, other than a bona fide full time employee of the Bidder has been retained or hired to solicit for or in any way assist the Bidder in obtaining the contract for services upon an agreement or understanding that such person, corporation, or entity be paid a fee or other compensation contingent upon the award of the contract to the Bidder.
- 4. The Massachusetts Conflict of Interest Law, Chapter 268A of the Massachusetts General Laws, applies to the Bidder with respect to the services outlined in the Project Manual.
- 5. Bidder, its officers, employees, agents, subcontractors and affiliated agencies, shall not participate in any activity which constitutes a violation of the Massachusetts Conflict of Interest Law or which creates an appearance of a violation of the Massachusetts Conflict of Interest Law.

Name of Bidder

Address of Bidder

By:

Signature

Printed Name

Printed Title

## CERTIFICATE AS TO CORPORATE BIDDER

<u>    I,                                </u>	certify that I am the	of the corporation
named as Bidder in the Bid included he	erein; that	, who signed said Bid on behalf of
the Bidder was then	of said corporation; that I	know his signature; that his signature
thereon is genuine and that said Bid wa	s duly signed, sealed and exe	ecuted for and in behalf of said
corporation by authority of its governir	ng body.	

## (Corporate Seal)

Name of Bidder

Address of Bidder

Telephone Number

By:

Signature

Printed Name

Printed Title

Date

This Certificate shall be completed where Bidder is a Corporation and shall be so completed by its Clerk. In the event that the Clerk is the person signing the Bidder on behalf of the Corporation, this certificate shall be completed by another office of the Corporation.

## CERTIFICATE OF COMPLIANCE WITH M.G.L., C.151B

The Bidder hereby certifies that it is in compliance with and shall remain in compliance with Massachusetts General Laws (M.G.L.) Chapter 151B and shall not discriminate on any prohibited basis outlined herein.

Name of Bidder

Address of Bidder

Telephone Number

By:

Signature

Printed Name

Printed Title

## CERTIFICATE OF NON-DEBARMENT

The undersigned further certifies under penalty of perjury that the said undersigned is not presently debarred from doing public construction work in the Commonwealth under the provisions of section twenty-nine F of chapter twenty-nine or any other applicable debarment provisions of any other chapter of the General Law or any rule or regulation promulgated thereunder.

(Company Name)	
(Signature title)	
Name of Bidder	
Address of Bidder	
By: Signature	
Printed Name	
Printed Title	
Date	

## CERTIFICATE OF FOREIGN CORPORATION

If the Bidder is a foreign corporation, by affixing his or her signature, the Bidder certifies that the corporation is qualified under provision of M.G.L. c. 181, Section 4 to do business in the Commonwealth of Massachusetts.

Name of Bidder

Address of Bidder

By:

Signature

Printed Name

Printed Title

Date

If awarded the Contract, the Contractor shall provide with his agreement package, a certificate from the Secretary of the Commonwealth of Massachusetts that the corporation is qualified under provisions of M.G.L. c.181, Section 4, to do business in the Commonwealth.

## CONTRACT INSURANCE REQUIREMENTS

The undersigned certifies that he/she is aware of the insurance requirements of this Contract and he/she is willing and able to furnish the required insurance as specified, and that this Bid is prepared on the basis of compliance with these requirements.

Name of Bidder

Address of Bidder

By:

Signature

Printed Name

Printed Title

## OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION CERTIFICATION

The undersigned agrees that if he is selected as the contractor, he shall comply with the provisions of M.G.L. Chapter 30, Section 39S.

The undersigned certifies, under penalties of perjury, that he is able to furnish labor that can work in harmony with all other elements of labor employed or to be employed in the work; that all employees to be employed at the worksite shall have successfully completed a course in construction safety and health approved by the United States Occupational Safety and Health Administration that is at least ten (10) hours in duration at the time the employee begins work and who shall furnish documentation of successful completion of said course with the first certified payroll report for each employee; and that all employees to be employed in the work subject to this Bid have successfully completed a course in construction safety and health approved by the United States Occupational Safety and Health Administration that is at least ten (10) hours in duration in the work subject to this Bid have successfully completed a course in construction safety and health approved by the United States Occupational Safety and Health Administration that is at least ten (10) hours in duration.

Name of Bidder

Address of Bidder

By:

Signature

Printed Name

Printed Title

This document has important legal consequences; consultation with an attorney is encouraged with respect to its use or modification. This document should be adapted to the particular circumstances of the contemplated Project and the Controlling Law.

## STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

Prepared by

#### ENGINEERS JOINT CONTRACT DOCUMENTS COMMITTEE

and

Issued and Published Jointly By





PROFESSIONAL ENGINEERS IN PRIVATE PRACTICE a practice division of the

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AMERICAN COUNCIL OF ENGINEERING COMPANIES

AMERICAN SOCIETY OF CIVIL ENGINEERS

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The Associated General Contractors of America



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Construction Specifications Institute

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American Council of Engineering Companies 1015 15th Street, N.W., Washington, DC 20005

American Society of Civil Engineers 1801 Alexander Bell Drive, Reston, VA 20191-4400

These General Conditions have been prepared for use with the Suggested Forms of Agreement Between Owner and Contractor Nos. C-520 or C-525 (2002 Editions). Their provisions are interrelated and a change in one may necessitate a change in the other. Comments concerning their usage are contained in the EJCDC Construction Documents, General and Instructions (No. C-001) (2002 Edition). For guidance in the preparation of Supplementary Conditions, see Guide to the Preparation of Supplementary Conditions (No. C-800) (2002 Edition).

## NOTE:

Highlighted text (*Substantial Completion*) indicates the paragraph has been amended. Stricken text indicates the paragraph has been deleted or superseded.

 $\rightarrow$  Indicates a paragraph(s) has/have been inserted.

#### **TABLE OF CONTENTS**

superseded notation and the Supplementary Conditions, the requirement in the Supplementary Conditions supersedes the General Conditions.         Prec           ARTICLE 1 - DEFINITIONS AND TERMINOLOGY         6           1.01         Defined Terms         6           1.02         Terminology         8           ARTICLE 2 - PRELIMINARY MATTERS         9           2.01         Delivery of Bonds and Evidence of Insurance.         9           2.02         Cogies of Documents.         9           2.03         Commencement of Contract Times: Notice to Proceed         9           2.04         Starting the Work         9           2.05         Before Starting Construction         9           2.06         Preconstruction Conference         9           2.07         Initial Acceptance of Schedules         9           3.03         Reporting and Mesolving Discrepancies         10           3.04         Amending and Supplementing Contract Documents         11           3.05         Reuse of Documents         11           3.06         Electronic Data         11           4.01         Availability of LANDS; SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS         11           4.02         Substructure or Physical Conditions         12           4.03		If there is a contradiction between the General Conditions amendments or	]
Ithe Supplementary Conditions supersedes the General Conditions.           ARTICLE 1 - DIFINITIONS AND TERMINOLOGY         6           1.01         Dofined Terms         6           1.02         Terminology         8           ARTICLE 2 - PRELIMINARY MATTERS         9           2.01         Delivery of Bonds and Evidence of Insurance         9           2.02         Copies of Documents         9           2.03         Commencement of Contract Times; Notice to Proceed         9           2.04         Starring the Work         9           2.05         Before Starting Construction         9           2.06         Preconstruction Conference         9           2.07         Initial Acceptance of Schedules         9           2.08         Reference Standards         10           3.01         Intent.         10           3.02         Reference Standards         10           3.04         Amending and Supplementing Contract Documents         11           3.06         Electronic Data         11           3.07         Reference Standards         10           3.08         Electronic Data         11           3.09         Electronic Data         11           3.00			Page
ARTICLE 1 - DEFINITIONS AND TERMINOLOGY       6         1.01       Defined Terms       6         1.02       Terminology       8         ARTICLE 2 - PRELIMINARY MATTERS       9         2.01       Delivery of Bonds and Evidence of Insurance       9         2.02       Copies of Documents       9         2.03       Commencement of Contract Times; Notice to Proceed       9         2.04       Starting the Work       9         2.05       Before Starting Construction       9         2.06       Preconstruction Conference       9         2.07       Initial Acceptance of Schedules       9         3.01       Intent       10         3.02       Reference Standards       10         3.03       Reporting and Resolving Discrepancies       10         3.04       Amending and Supplementing Contract Documents       11         3.05       Reuse of Documents       11         3.06       Electronic Data       11         4.01       Availability of LANDS; SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS         ENVIRONMENTAL CONDITIONS, REFERENCE POINTS       11         4.01       Availability of Indas       11         4.02       Subsurgiace or Physical Conditions			_
101       Defined Terms       6         102       Terminology       8         ARTICLE 2 - PRELIMINARY MATTERS       9         201       Delivery of Bonds and Evidence of Insurance       9         202       Cogies of Documents       9         203       Commencement of Contract Times; Notice to Proceed       9         204       Starting the Work       9         205       Before Starting Construction       9         206       Preconstruction Conference       9         207       Initial Acceptance of Schealaes       9         201       Initial Acceptance of Schealaes       10         301       Intent       10         302       Reference Standards       10         303       Reporting and Resolving Discrepancies       10         304       Amending and Supplementing Contract Documents       11         305       Reuse of Documents       11         306       Fleetronic Data       11         401       Avaitability of Lands       11         402       Subsurface and Physical Conditions       12         403       Differing Subsurface of Physical Conditions       12         403       Differing Subsurface of Physical Conditions			J
1.02       Terminology       8         ARTICLE 2 - PRELIMINARY MATTERS       9         2.01       Delivery of Bonds and Evidence of Insurance       9         2.02       Copies of Documents       9         2.03       Commencement of Contract Times; Notice to Proceed       9         2.04       Starting the Work       9         2.05       Before Starting Construction       9         2.06       Preconstruction Conference       9         2.07       Initial Acceptance of Schedules       9         ARTICLE 3 - CONTRACT DOCUMENTS: INTENT, AMENDING, REUSE       10         3.01       Intent       10         3.02       Reference Standards       10         3.03       Reporting and Resolving Discrepancies       10         3.04       Amending and Supplementing Contract Documents       11         3.05       Reuse of Documents       11         ARTICLE 4 - AVAILABILITY OF LANDS, SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS       11         ENVIRONMENTAL CONDITIONS; REFREENCE POINTS       11         4.01       Availability of Lands       11         4.02       Subsurface or Physical Conditions       12         4.03       Differing Subsurface or Physical Conditions       12			
ARTICLE 2 - PRELIMINARY MATTERS       9         2.01       Delivery of Bonds and Evidence of Insurance       9         2.02       Copies of Documents       9         2.03       Commencement of Contract Times; Notice to Proceed       9         2.04       Starting the Work       9         2.05       Before Starting Construction       9         2.06       Preconstruction Conference       9         2.07       Initial Acceptance of Schedules       9         3.01       Intent       10         3.02       Reference Standards       10         3.03       Reporting cant Resolving Discrepancies       10         3.04       Amending and Supplementing Contract Documents       11         3.05       Reuse of Documents       11         3.06       Electronic Data       11         3.07       Reporting cant Resolving Discrepancies       11         3.08       Electronic Data       11         4.01       Availability of Lands       11         4.02       Subsurface and Physical Conditions       12         4.03       Differing Subsurface or Physical Conditions       12         4.04       Underground Facilities       13         4.04       Under			
201       Delivery of Bonds and Evidence of Insurance       9         202       Copies of Documents       9         203       Commencement of Contract Times; Notice to Proceed       9         204       Starting the Work       9         205       Before Starting Construction       9         206       Preconstruction Conference       9         207       Initial Acceptance of Schedules       9         201       Initial Acceptance of Schedules       9         301       Intent       10         302       Reference Standards       10         303       Reporting and Resolving Discrepancies       10         304       Amending and Supplementing Contract Documents       11         305       Reuse of Documents       11         306       Electronic Data       11         401       Availability of LanDS; REFERENCE POINTS       11         402       Subsurface and Physical Conditions       12         403       Differing Subsurface or Physical Conditions       12         403       Differing Subsurface or Physical Conditions       13         404       Underground Facilities       13         405       Reference P alinst       13			
202       Copies of Documents       9         203       Commencement of Contract Times; Notice to Proceed       9         204       Starting the Work       9         205       Before Starting Construction       9         206       Preconstruction Conference       9         207       Initial Acceptance of Schedules       9         ARTICLE 3 - CONTRACT DOCUMENTS: INTENT, AMENDING, REUSE       10         301       Intent       10         302       Reference Standards       10         303       Reporting and Resolving Discrepancies       10         304       Amending and Supplementing Contract Documents       11         305       Reuse of Documents       11         306       Electronic Data       11         ARTICLE 4 - AVAILABILITY OF LANDS, SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS       11         401       Availability of Lands       11         402       Subsurface and Physical Conditions       12         403       Differing Subsurface or Physical Conditions       12         404       Underground Facilities       13         405       Reference Points       14         503       Certificates of Insurance       15         504			
2.03       Commencement of Contract Times; Notice to Proceed       9         2.04       Starting the Work.       9         2.05       Before Starting Construction       9         2.06       Preconstruction Conference       9         2.07       Initial Acceptance of Schedules       9         2.08       Reformance of Schedules       9         3.01       Intern       10         3.02       Reference Standards       10         3.03       Reporting and Resolving Discrepancies       10         3.04       Amending and Supplementing Contract Documents       11         3.05       Reuse of Documents       11         3.06       Electronic Data       11         3.07       Revailability of LANDS; SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS         ENVIRONMENTAL CONDITIONS; REFERENCE POINTS       11         4.01       Availability of Lands.       12         4.02       Subsurface and Physical Conditions       12         4.03       Differing Subsurface Or Physical Conditions       12         4.04       Underground Facilities       13         4.05       Reference Points       13         4.06       Reardous Environmental Condition at Site       13			
2.04       Starting the Work       9         2.05       Before Starting Construction       9         2.06       Preconstruction Conference       9         2.07       Initial Acceptance of Schedules       9         ARTICLE 3 - CONTRACT DOCUMENTS: INTENT, AMENDING, REUSE       10         3.01       Intent       10         3.02       Reference Standards       10         3.03       Reporting and Resolving Discrepancies       10         3.04       Amending and Supplementing Contract Documents       11         3.05       Reuse of Documents       11         3.06       Electronic Data       11         1.07       Reuse of Documents       11         3.08       Relegating and Supplementing Contract Documents       11         1.08       Electronic Data       11         1.09       Reuse of Documents       11         1.01       Availability of Lands.       11         4.01       Availability of Lands.       12         4.03       Differing Subsurface or Physical Conditions       12         4.04       Underground Facilities       13         4.05       Reference Points       13         4.06       Hazardous Environmental Condition at Si			
205       Before Starting Construction       9         206       Preconstruction Conference       9         207       Initial Acceptance of Schedules       9         ARTICLE 3 - CONTRACT DOCUMENTS: INTENT, AMENDING, REUSE       10         301       Intent       10         302       Reference Standards       10         303       Reporting and Resolving Discrepancies       10         304       Amending and Supplementing Contract Documents       11         305       Reuse of Documents       11         306       Electronic Data       11         ARTICLE 4 - AVAILABILITY OF LANDS; SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS       11         ENVIRONMENTAL CONDITIONS; REFERENCE POINTS       11         4.01       Availability of Lands.       12         4.02       Subsurface and Physical Conditions       12         4.03       Differing Subsurface or Physical Conditions       12         4.04       Underground Facilities       13         4.05       Reference Points       13         4.06       Hazardous Environmental Condition at Site       13         4.01       Vietorese Assurface on Physical Conduction at Site       14         5.01       Centritactor's Liability Insurance			
2.06       Preconstruction Conference       9         2.07       Initial Acceptance of Schedules       9         ARTICLE 3 - CONTRACT DOCUMENTS: INTENT, AMENDING, REUSE       10         3.01       Intent       10         3.02       Reference Standards       10         3.03       Reporting and Resolving Discrepancies       10         3.04       Amending and Supplementing Contract Documents       11         3.05       Reuse of Documents       11         3.06       Electronic Data       11         ARTICLE 4 - AVAILABILITY OF LANDS; SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS       ENVIRONMENTAL CONDITIONS; REFERENCE POINTS       11         4.01       Availability of Lands       11       14       12         4.03       Differing Subsurface or Physical Conditions       12       13         4.04       Underground Facilities       13         4.05       Reference Points       13         4.06       Hazardous Environmental Condition at Site       14         5.01       Performance, Payment, and Other Bonds       14         5.02       Licensed Sureties and Insurance       15         5.04       Contractor's Liability Insurance       15         5.05       Owner's Liability Insurance			
2.07       Initial Acceptance of Schedules       9         ARTICLE 3 - CONTRACT DOCUMENTS: INTENT, AMENDING, REUSE       10         3.01       Intent       10         3.02       Reference Standards       10         3.03       Reporting and Resolving Discrepancies       10         3.04       Amending and Supplementing Contract Documents       11         3.05       Reuse of Documents       11         3.06       Electronic Data       11         ARTICLE 4 - AVAILABILITY OF LANDS; SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS       11         ENVIRONMENTAL CONDITIONS; REFERENCE POINTS       11         4.01       Availability of Lands       11         4.02       Subsurface and Physical Conditions       12         4.03       Differing Subsurface OrPhysical Conditions       12         4.04       Underground Facilities       13         4.05       Reference Points       13         4.06       Hazardous Environmental Condition at Site       13         4.01       Availability of NURNACE       14         5.01       Performance, Payment, and Other Bonds       14         5.02       Liensed Survince and Insurance       15         5.03       Certificates of Insurance       15 </td <td></td> <td></td> <td></td>			
ARTICLE 3 - CONTRACT DOCUMENTS: INTENT, AMENDING, REUSE       10         3.01       Intent       10         3.02       Reference Standards       10         3.03       Reporting and Resolving Discrepancies       10         3.04       Amending and Supplementing Contract Documents.       11         3.05       Reuse of Documents       11         3.06       Electronic Data       11         3.07       Nath ILTY OF LANDS; SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS         ENVIRONMENTAL CONDITIONS; REFERENCE POINTS       11         4.01       Availability of Lands       12         4.02       Subsurface and Physical Conditions       12         4.03       Differing Subsurface or Physical Conditions       12         4.04       Underground Facilities       13         4.05       Reference Points       13         4.06       Hazardous Environmental Condition at Site       13         4.01       Performance, Payment, and Other Bonds       14         5.03       Certificates of Insurance       15         5.04       Contractor's Liability Insurance       15         5.05       Owner's Liability Insurance       16         5.06       Property Insurance       16			
3.01       Intent       10         3.02       Reference Standards       10         3.03       Reporting and Resolving Discrepancies       10         3.04       Amending and Supplementing Contract Documents       11         3.05       Reuse of Documents       11         3.06       Electronic Data       11         3.07       Reuse of Documents       11         3.08       Electronic Data       11         ARTICLE 4 - AVAILABILITY OF LANDS; SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS       11         ENVIRONMENTAL CONDITIONS; REFERENCE POINTS       11         4.01       Availability of Lands       12         4.03       Differing Subsurface or Physical Conditions       12         4.04       Underground Facilities       13         4.05       Reference Points       13         4.06       Hazardous Environmental Condition at Site       13         ARTICLE 5 - BONDS AND INSURANCE       14       14         5.01       Performance, Payment, and Other Bonds       14         5.02       Owner's Liability Insurance       15         5.03       Certificates of Insurance       15         5.04       Contractor's Liability Insurance       16         5.05 <td></td> <td></td> <td></td>			
3.02       Reference Standards       10         3.03       Reporting and Resolving Discrepancies       10         3.04       Amending and Supplementing Contract Documents       11         3.05       Reuse of Documents       11         3.06       Electronic Data       11         3.07       Retronic Data       11         3.08       Retronic Data       11         ARTICLE 4 - AVAILABILITY OF LANDS; SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS       11         4.01       Availability of LANDS; REFERENCE POINTS       11         4.01       Availability of LANDS; REFERENCE POINTS       12         4.03       Differing Subsurface or Physical Conditions       12         4.04       Underground Facilities       13         4.05       Reference Points       13         4.06       Hazardous Environmental Condition at Site       13         ARTICLE 5 - BONDS AND INSURANCE       14         5.01       Contractor's Liability Insurance       15         5.02       Licensed Sureties and Insurance       15         5.03       Certificates of Insurance       16         5.04       Contractor's Liability Insurance       16         5.05       Owarer 's Liability Insurance       17			
3.03       Reporting and Resolving Discrepancies       10         3.04       Amending and Supplementing Contract Documents       11         3.05       Reuse of Documents       11         3.06       Electronic Data       11         ARTICLE 4 - AVAILABILITY OF LANDS; SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS       11         ENVIRONMENTAL CONDITIONS; REFERENCE POINTS       11         4.01       Availability of Lands       12         4.03       Differing Subsurface or Physical Conditions       12         4.04       Underground Facilities       13         4.05       Reference Points       13         4.06       Hazardous Environmental Condition at Site       13         4.07       Performance, Payment, and Other Bonds       14         5.01       Performance, Payment, and Other Bonds       15         5.03       Certificates of Insurance       15         5.04       Contractor's Liability Insurance       16         5.07       Owner's Liability Insurance       16         5.08       Receipt and Application of Insurance Proceeds       17         5.09       Accertance of Bonds and Insurance: Option to Replace       17         5.09       Acceptance of Bonds and Insurance: Option to Replace       17			
3.04       Amending and Supplementing Contract Documents.       11         3.05       Reuse of Documents.       11         3.06       Electronic Data       11         ARTICLE 4 - AVAILABILITY OF LANDS; SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS       11         ENVIRONMENTAL CONDITIONS, REFERENCE POINTS.       11         4.01       Availability of Lands.       12         4.03       Differing Subsurface or Physical Conditions.       12         4.04       Underground Facilities.       13         4.05       Reference Points       13         4.06       Hazardous Environmental Condition at Site       13         4.06       Hazardous Environmental Condition at Site       14         5.01       Performance, Payment, and Other Bonds.       14         5.02       Cientificates of Insurance       15         5.03       Certificates of Insurance       15         5.04       Contractor's Liability Insurance       16         5.05       Owner's Liability Insurance       16         5.06       Property Insurance       16         5.07       Waiver of Rights.       17         5.08       Receipt and Application of Insurance Proceeds       17         5.09       Contractor's S RESPONSIBILITIE			
3.05       Reuse of Documents       11         3.06       Electronic Data       11         3.06       Electronic Data       11         3.07       Reuse of Documents       11         ARTICLE 4 - AVAILABILITY OF LANDS; SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS       11         4.01       Availability of Lands       11         4.01       Availability of Lands       11         4.02       Subsurface and Physical Conditions       12         4.03       Differing Subsurface or Physical Conditions       12         4.04       Underground Facilities       13         4.05       Reference Points       13         4.06       Hazardous Environmental Condition at Site       13         ARTICLE 5 - BONDS AND INSURANCE       14         5.01       Performance, Payment, and Other Bonds       14         5.02       Comtractor's Liability Insurance       15         5.03       Certificates of Insurance       16         5.05       Owner's Liability Insurance       16         5.06       Property Insurance       16         5.07       Waiver of Rights       17         5.08       Receipt and Application of Insurance Proceeds       17         5.09			
3.06       Electronic Data.       11         ARTICLE 4 - AVAILABILITY OF LANDS; SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS       11         ENVIRONMENTAL CONDITIONS; REFERENCE POINTS.       11         4.01       Availability of Lands.       11         4.02       Subsurface and Physical Conditions.       12         4.03       Differing Subsurface or Physical Conditions.       12         4.04       Underground Facilities.       13         4.05       Reference Points       13         4.06       Hazardous Environmental Condition at Site       13         4.01       Performance, Payment, and Other Bonds.       14         5.01       Performance.       15         5.02       Certificates of Insurance.       15         5.03       Certificates of Insurance.       15         5.04       Contractor's Liability Insurance       16         5.07       Waiver of Rights.       17         5.08       Receipt and Application of Insurance Proceeds       17         5.09       Acceptance of Bonds and Insurance: Option to Replace.       17         5.01       Partial Utilization, Acknowledgment of Property Insurer       18         6.01       Supervision and Supervision and Supervision and Superintiendence.       18 <td></td> <td></td> <td></td>			
ARTICLE 4 - AVAILABILITY OF LANDS; SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS         ENVIRONMENTAL CONDITIONS; REFERENCE POINTS       11         4.01       Availability of Lands.       11         4.02       Subsurface and Physical Conditions.       12         4.03       Differing Subsurface or Physical Conditions       12         4.04       Underground Facilities.       13         4.05       Reference Points       13         4.06       Hazardous Environmental Condition at Site       13         4.06       Hazardous Environmental Condition at Site       13         A.06       Hazardous Environmental Condition at Site       14         5.01       Performance, Payment, and Other Bonds.       14         5.02       Licensed Sureties and Insurers       15         5.03       Certificates of Insurance       15         5.04       Contractor's Liability Insurance       16         5.05       Owner's Liability Insurance       16         5.06       Property Insurance       16         5.07       Waiver of Rights.       17         5.08       Receipt and Application of Insurance Proceeds       17         5.09       Acceptance of Bonds and Insurance; Option to Replace       17         5.09 <t< td=""><td></td><td></td><td></td></t<>			
ENVIRONMENTAL CONDITIONS; REFERENCE POINTS.       11         4.01       Availability of Lands.       11         4.02       Subsurface and Physical Conditions.       12         4.03       Differing Subsurface or Physical Conditions       12         4.04       Underground Facilities.       13         4.05       Reference Points       13         4.06       Hazardous Environmental Condition at Site       13         ANTICLE 5 - BONDS AND INSURANCE       14         5.01       Performance, Payment, and Other Bonds.       14         5.02       Licensed Sureties and Insurers       15         5.03       Certificates of Insurance       15         5.04       Contractor's Liability Insurance       16         5.05       Owner's Liability Insurance       16         5.06       Property Insurance       16         5.07       Quiet of Rights       17         5.08       Receipt and Application of Insurance Proceeds       17         5.09       Acceptance of Bonds and Insurance; Option to Replace       17         5.09       Acceptance of Bonds and Insurance; Option to Replace       17         5.01       Supervision and Superintendence       18         6.01       Supervision and Superintenden			11
4.01       Availability of Lands       11         4.02       Subsurface and Physical Conditions       12         4.03       Differing Subsurface or Physical Conditions       12         4.04       Underground Facilities       13         4.05       Reference Points       13         4.06       Hazardous Environmental Condition at Site       13         4.06       Hazardous Environmental Condition at Site       13         4.06       Hazardous Environmental Condition at Site       13         4.01       Performance, Payment, and Other Bonds       14         5.01       Performance, Payment, and Other Bonds       14         5.02       Licensed Sureties and Insurers       15         5.03       Certificates of Insurance       15         5.04       Contractor's Liability Insurance       16         5.05       Owner's Liability Insurance       16         5.07       Waiver of Rights       17         5.08       Receipt and Application of Insurance Proceeds       17         5.09       Acceptance of Bonds and Insurance; Option to Replace       17         5.09       Acceptance of Bonds and Insurance; Option to Replace       18         6.01       Supervision and Superintendence       18			11
4.02Subsurface and Physical Conditions124.03Differing Subsurface or Physical Conditions124.04Underground Facilities134.05Reference Points134.06Hazardous Environmental Condition at Site13A.01Performance, Payment, and Other Bonds145.01Performance, Payment, and Other Bonds145.02Licensed Sureties and Insurers155.03Certificates of Insurance155.04Contractor's Liability Insurance165.05Owner's Liability Insurance165.06Property Insurance165.07Waiver of Rights175.08Receipt and Application of Insurance Proceeds175.09Acceptance of Bonds and Insurance Proceeds175.01Supervision and Superintendence186.01Supervision and Superintendence186.02Labor; Working Hours186.03Services, Materials, and Equipment186.04Progress Schedule186.05Substitutes and 'O'-Equals''196.06Concerning Subcontractors, Suppliers, and Others206.07Patent Fees and Royalties216.08Permits216.09Laws and Regulations216.09Labor; Working Hours206.01Supervision and Superintendence206.02Labor; Working Hours206.05Substitutes and 'O'-Equals''20			
4.03Differing Subsurface or Physical Conditions124.04Underground Facilities134.05Reference Points134.06Hazardous Environmental Condition at Site13ARTICLE 5 - BONDS AND INSURANCE145.01Performance, Payment, and Other Bonds145.02Licensed Sureties and Insurers155.03Certificates of Insurance155.04Contractor's Liability Insurance165.05Owner's Liability Insurance165.06Property Insurance165.07Waiver of Rights175.08Receipt and Application of Insurance Proceeds175.09Acceptance of Bonds and Insurance; Option to Replace175.10Partial Utilization, Acknowledgment of Property Insurer186.01Supervision and Superintendence186.02Labor; Working Hours186.03Services, Materials, and Equipment186.04Progress Schedule186.05Substitutes and "Or-Equals"186.06Concerning Subcontractors, Suppliers, and Others206.07Patent Fees and Royalties216.08Permits216.09Laws and Regulations216.10Taxes226.11Use of Site and Other Areas22			
4.04Underground Facilities.134.05Reference Points134.06Hazardous Environmental Condition at Site13ARTICLE 5 - BONDS AND INSURANCE145.01Performance, Payment, and Other Bonds.145.02Licensed Sureties and Insurers155.03Certificates of Insurance155.04Contractor's Liability Insurance165.05Owner's Liability Insurance165.06Property Insurance165.07Waiver of Rights.175.08Receipt and Application of Insurance Proceeds175.09Acceptance of Bonds and Insurance; Option to Replace175.10Partial Utilization, Acknowledgment of Property Insurer186.01Supervision and Superintendence186.02Labor; Working Hours186.03Services, Materials, and Equipment186.04Progress Schedule186.05Substitutes and "Or-Equals"196.06Concerning Subcontractors, Suppliers, and Others206.07Patent Fees and Royalties.216.09Laws and Regulations216.10Taxes226.11Use of Site and Other Areas22			
4.05Reference Points134.06Hazardous Environmental Condition at Site13ARTICLE 5 - BONDS AND INSURANCE145.01Performance, Payment, and Other Bonds145.02Licensed Sureties and Insurers155.03Certificates of Insurance155.04Contractor's Liability Insurance155.05Owner's Liability Insurance165.06Property Insurance165.07Waiver of Rights175.08Receipt and Application of Insurance Proceeds175.09Acceptance of Bonds and Insurance; Option to Replace175.09Acceptance of Bonds and Insurance; Option to Replace186.01Supervision and Superintendence186.02Labor; Working Hours186.03Services, Materials, and Equipment186.04Progress Schedule186.05Substitutes and "Or-Equals"196.06Concerning Subcontractors, Suppliers, and Others206.07Patent Fees and Royalties216.08Permits216.09Laws and Regulations216.10Taxes226.11Use of Site and Other Areas22			
4.06Hazardous Environmental Condition at Site13ARTICLE 5 - BONDS AND INSURANCE145.01Performance, Payment, and Other Bonds145.02Licensed Sureties and Insurers155.03Certificates of Insurance155.04Contractor's Liability Insurance155.05Owner's Liability Insurance165.06Property Insurance165.07Waiver of Rights175.08Receipt and Application of Insurance Proceeds175.09Acceptance of Bonds and Insurance; Option to Replace175.10Partial Utilization, Acknowledgment of Property Insurer186.01Supervision and Superintendence186.02Labor; Working Hours186.03Services, Materials, and Equipment186.04Progress Schedule186.05Substitutes and "Or-Equals"196.06Concerning Subcontractors, Suppliers, and Others206.07Patent Fees and Royalties216.08Permits216.09Laws and Regulations216.10Taxes226.11Use of Site and Other Areas22			
ARTICLE 5 - BONDS AND INSURANCE145.01Performance, Payment, and Other Bonds.145.02Licensed Sureties and Insurers155.03Certificates of Insurance155.04Contractor's Liability Insurance155.05Owner's Liability Insurance165.06Property Insurance165.07Waiver of Rights175.08Receipt and Application of Insurance Proceeds175.09Acceptance of Bonds and Insurance; Option to Replace175.01Partial Utilization, Acknowledgment of Property Insurer18ARTICLE 6 - CONTRACTOR'S RESPONSIBILITIES186.01Supervision and Superintendence186.02Labor; Working Hours186.03Services, Materials, and Equipment186.04Progress Schedule186.05Substitutes and "Or-Equals"196.06Concerning Subcontractors, Suppliers, and Others206.07Patent Fees and Royalties216.08Permits216.09Laws and Regulations216.10Taxes226.11Use of Site and Other Areas22			
5.01Performance, Payment, and Other Bonds.145.02Licensed Sureties and Insurers155.03Certificates of Insurance155.04Contractor's Liability Insurance155.05Owner's Liability Insurance165.06Property Insurance165.07Waiver of Rights175.08Receipt and Application of Insurance Proceeds175.09Acceptance of Bonds and Insurance; Option to Replace175.10Partial Utilization, Acknowledgment of Property Insurer18ARTICLE 6 - CONTRACTOR'S RESPONSIBILITIES186.01Supervision and Superintendence186.02Labor; Working Hours.186.03Services, Materials, and Equipment186.04Progress Schedule186.05Substitutes and "Or-Equals"196.06Concerning Subcontractors, Suppliers, and Others.206.07Patent Fees and Royalties216.08Permits216.09Laws and Regulations226.11Use of Site and Other Areas22			
5.02Licensed Sureties and Insurers155.03Certificates of Insurance155.04Contractor's Liability Insurance155.05Owner's Liability Insurance165.06Property Insurance165.07Waiver of Rights175.08Receipt and Application of Insurance Proceeds175.09Acceptance of Bonds and Insurance; Option to Replace175.09Acceptance of Bonds and Insurance; Option to Replace18ARTICLE 6 - CONTRACTOR'S RESPONSIBILITIES186.01Supervision and Superintendence186.02Labor; Working Hours186.03Services, Materials, and Equipment186.04Progress Schedule186.05Substitutes and "Or-Equals"196.06Concerning Subcontractors, Suppliers, and Others206.07Patent Fees and Royalties216.08Permits216.09Laws and Regulations216.10Taxes226.11Use of Site and Other Areas22			
5.03Certificates of Insurance155.04Contractor's Liability Insurance155.05Owner's Liability Insurance165.06Property Insurance165.07Waiver of Rights175.08Receipt and Application of Insurance Proceeds175.09Acceptance of Bonds and Insurance; Option to Replace175.10Partial Utilization, Acknowledgment of Property Insurer18ARTICLE 6 - CONTRACTOR'S RESPONSIBILITIES186.01Supervision and Superintendence186.02Labor; Working Hours186.03Services, Materials, and Equipment186.04Progress Schedule186.05Substitutes and "Or-Equals"196.06Concerning Subcontractors, Suppliers, and Others206.07Patent Fees and Royalties216.08Permits216.09Laws and Regulations216.10Taxes226.11Use of Site and Other Areas22			
5.04Contractor's Liability Insurance155.05Owner's Liability Insurance165.06Property Insurance165.07Waiver of Rights175.08Receipt and Application of Insurance Proceeds175.09Acceptance of Bonds and Insurance; Option to Replace175.10Partial Utilization, Acknowledgment of Property Insurer18ARTICLE 6 - CONTRACTOR'S RESPONSIBILITIES186.01Supervision and Superintendence186.02Labor; Working Hours186.03Services, Materials, and Equipment186.04Progress Schedule186.05Substitutes and "Or-Equals"196.06Concerning Subcontractors, Suppliers, and Others206.07Patent Fees and Royalties216.08Permits216.09Laws and Regulations216.10Taxes226.11Use of Site and Other Areas22			
5.05Owner's Liability Insurance165.06Property Insurance165.07Waiver of Rights175.08Receipt and Application of Insurance Proceeds175.09Acceptance of Bonds and Insurance; Option to Replace175.10Partial Utilization, Acknowledgment of Property Insurer18ARTICLE 6 - CONTRACTOR'S RESPONSIBILITIES186.01Supervision and Superintendence186.02Labor; Working Hours186.03Services, Materials, and Equipment186.04Progress Schedule186.05Substitutes and "Or-Equals"196.06Concerning Subcontractors, Suppliers, and Others206.07Pattert Fees and Royalties216.08Permits216.09Laws and Regulations216.10Taxes226.11Use of Site and Other Areas22			
5.06Property Insurance165.07Waiver of Rights175.08Receipt and Application of Insurance Proceeds175.09Acceptance of Bonds and Insurance; Option to Replace175.10Partial Utilization, Acknowledgment of Property Insurer18ARTICLE 6 - CONTRACTOR'S RESPONSIBILITIES186.01Supervision and Superintendence186.02Labor; Working Hours186.03Services, Materials, and Equipment186.04Progress Schedule186.05Substitutes and "Or-Equals"196.06Concerning Subcontractors, Suppliers, and Others206.07Patent Fees and Royalties216.08Permits216.09Laws and Regulations216.10Taxes226.11Use of Site and Other Areas22		•	
5.07Waiver of Rights.175.08Receipt and Application of Insurance Proceeds175.09Acceptance of Bonds and Insurance; Option to Replace175.10Partial Utilization, Acknowledgment of Property Insurer18ARTICLE 6 - CONTRACTOR'S RESPONSIBILITIES186.01Supervision and Superintendence186.02Labor; Working Hours186.03Services, Materials, and Equipment186.04Progress Schedule186.05Substitutes and "Or-Equals"196.06Concerning Subcontractors, Suppliers, and Others206.07Patent Fees and Royalties216.08Permits216.09Laws and Regulations216.10Taxes226.11Use of Site and Other Areas22		•	
5.08Receipt and Application of Insurance Proceeds175.09Acceptance of Bonds and Insurance; Option to Replace175.10Partial Utilization, Acknowledgment of Property Insurer18ARTICLE 6 - CONTRACTOR'S RESPONSIBILITIES186.01Supervision and Superintendence186.02Labor; Working Hours186.03Services, Materials, and Equipment186.04Progress Schedule186.05Substitutes and "Or-Equals"196.06Concerning Subcontractors, Suppliers, and Others206.07Patent Fees and Royalties216.08Permits216.09Laws and Regulations216.10Taxes226.11Use of Site and Other Areas22			
5.09Acceptance of Bonds and Insurance; Option to Replace175.10Partial Utilization, Acknowledgment of Property Insurer18ARTICLE 6 - CONTRACTOR'S RESPONSIBILITIES186.01Supervision and Superintendence186.02Labor; Working Hours186.03Services, Materials, and Equipment186.04Progress Schedule186.05Substitutes and "Or-Equals"196.06Concerning Subcontractors, Suppliers, and Others206.07Patent Fees and Royalties216.08Permits216.09Laws and Regulations216.10Taxes226.11Use of Site and Other Areas22			
5.10Partial Utilization, Acknowledgment of Property Insurer18ARTICLE 6 - CONTRACTOR'S RESPONSIBILITIES186.01Supervision and Superintendence186.02Labor; Working Hours186.03Services, Materials, and Equipment186.04Progress Schedule186.05Substitutes and "Or-Equals"196.06Concerning Subcontractors, Suppliers, and Others206.07Patent Fees and Royalties216.08Permits216.09Laws and Regulations216.10Taxes226.11Use of Site and Other Areas22			
ARTICLE 6 - CONTRACTOR'S RESPONSIBILITIES186.01Supervision and Superintendence186.02Labor; Working Hours186.03Services, Materials, and Equipment186.04Progress Schedule186.05Substitutes and "Or-Equals"196.06Concerning Subcontractors, Suppliers, and Others206.07Patent Fees and Royalties216.08Permits216.09Laws and Regulations216.10Taxes226.11Use of Site and Other Areas22			
6.01Supervision and Superintendence186.02Labor; Working Hours186.03Services, Materials, and Equipment186.04Progress Schedule186.05Substitutes and "Or-Equals"196.06Concerning Subcontractors, Suppliers, and Others206.07Patent Fees and Royalties216.08Permits216.09Laws and Regulations216.10Taxes226.11Use of Site and Other Areas22			
6.03Services, Materials, and Equipment186.04Progress Schedule186.05Substitutes and "Or-Equals"196.06Concerning Subcontractors, Suppliers, and Others206.07Patent Fees and Royalties216.08Permits216.09Laws and Regulations216.10Taxes226.11Use of Site and Other Areas22			
6.03Services, Materials, and Equipment186.04Progress Schedule	6.02	Labor; Working Hours	18
6.04Progress Schedule	6.03		
6.05Substitutes and "Or-Equals"196.06Concerning Subcontractors, Suppliers, and Others206.07Patent Fees and Royalties216.08Permits216.09Laws and Regulations216.10Taxes226.11Use of Site and Other Areas22			
6.07Patent Fees and Royalties216.08Permits216.09Laws and Regulations216.10Taxes226.11Use of Site and Other Areas22	6.05		
6.07Patent Fees and Royalties216.08Permits216.09Laws and Regulations216.10Taxes226.11Use of Site and Other Areas22	6.06	Concerning Subcontractors, Suppliers, and Others	20
6.09         Laws and Regulations         21           6.10         Taxes         22           6.11         Use of Site and Other Areas         22	6.07		
6.10       Taxes       22         6.11       Use of Site and Other Areas       22	6.08	Permits	21
6.10       Taxes       22         6.11       Use of Site and Other Areas       22	6.09	Laws and Regulations	21
	6.10	Taxes	22
	6.11	Use of Site and Other Areas	22
	6.12	Record Documents	22

6.14       Safety Representative       23         6.15       Intergencies       23         6.16       Emergencies       23         6.17       Shop Dravings and Samples       23         6.18       Continuing the Work       24         6.19       Continuing the Work       24         6.10       Indermification       24         6.21       Delegation of Professional Design Services       25         7.01       Related Work at Site       25         7.02       Coordination       26         8.01       Communications to Contractor       26         8.01       Communications to Contractor       26         8.02       Replacement of Engineer       26         8.03       Fursish Data       26         8.04       Pay When Due       26         8.05       Lands and Easements: Reports and Tests       26         8.06       Instractions on Onner's Reports and Tests       26         8.06       Instractions on Onner's Reports and Tests       27         8.01       Unitaritions on Onner's Reports and Tests       27         8.04       Invitaritions on Onner's Reports and Tests       27         8.05       Lands and Easements: Reports and	6.13	Safety and Protection	
6.16       Emergencies.	6.14	Safety Representative	23
6.17       Shop Drawings and Samples       33         6.18       Continuing the Work       34         6.20       Indumification       34         6.20       Indumification       34         6.21       Delegation of Professional Design Services       35         8.710L1 7: - OTHER WORK AT THE SITE       35         7.01       Related Work at Site       35         7.02       Coordination       36         8.03       Funiships       36         8.01       Communications to Contractor       36         8.02       Replacement of Engineer       36         8.03       Funish Data       36         8.04       Forgument of Engineer       36         8.05       Lands and Eastements: Reports and Tests       36         8.06       Insurance       36         8.07       Change Orders       36         8.08       Inspections, Tests, and Approvals       36         8.09       Undisclosed Hazardous Environmental Condition       37         9.01       Owner's Representative       37         9.02       Visits to Site       37         9.03       Project Representative       37         9.04       Authorized V	6.15	Hazard Communication Programs	23
6.18       Continuing the Work	6.16	Emergencies	23
6.18       Continuing the Work	6.17	Shop Drawings and Samples	23
620       Indemnification	6.18	Continuing the Work	24
620       Indemnification	6.19		
6.21       Delegation of Professional Design Services	6.20		
ARTICLE 7 - OTHER WORK AT THE SITE       25         701       Related Work at Site	6.21		
701       Related Work at Site	ARTICLE		
7.02       Coordination       26         7.03       Legal Relationships       26         ARTICLE 8 - OWNER'S RESPONSIBILITIES       26         8.01       Communications to Contractor       26         8.02       Replacement of Engineer       26         8.03       Furnish Data       26         8.04       Pay When Due       26         8.05       Lands and Easements; Reports and Tests       26         8.06       Insurance       26         8.07       Change Orders       26         8.08       Inspections, Tests, and Approvals       26         8.09       Limitations on Owner's Responsibilities       27         8.10       Undisclosed Hazardous Environmental Condition       27         9.01       Owner's Representative       27         9.01       Owner's Representative       27         9.02       Visits to Site       27         9.03       Project Representative       27         9.04       Authorized Variations in Work       27         9.05       Rejecting Defective Work       28         9.06       Shop Drawings, Change Orders and Payments       28         9.07       Determinations of Change Orders and Payments       28			
703       Legal Relationships       26         ARTICLE 8 - OWNER'S RESPONSIBILITIES       26         801       Communications to Contractor       26         802       Replacement of Engineer       26         803       Furrish Data       26         804       Pay When Due       26         805       Lands and Easements; Reports and Tests       26         806       Insurance       26         807       Charge Orders       26         808       Inspections, Tests, and Approvals       26         809       Limitations on Owner's Responsibilities       27         810       Undisclowed Hazardous Environmental Condition       27         811       Evidence of Financial Arrangements.       27         901       Owner's Representative       27         902       Visit to Site       27         903       Project Representative       27         904       Authorized Variations in Work.       27         905       Shop Drawings, Change Orders and Payments.       28         906       Shop Drawings, Change Orders and Payments.       28         907       Decisions on Requirements of Contract Documents and Acceptability of Work.       28         908 <td></td> <td></td> <td></td>			
ARTICLE 8 - OWNER'S RESPONSIBILITIES       26         801       Communications to Contractor			
8.01       Communications to Contractor.       26         8.02       Replacement of Engineer       26         8.03       Furnish Data.       26         8.04       Pay When Due       26         8.05       Lunds and Easements; Reports and Tests       26         8.06       Insurance       26         8.07       Change Orders.       26         8.08       Inspections, Tests, and Approvals.       26         8.09       Limitations on Onser's Reponsibilities       27         8.10       Undisclosed Hazardous Environmental Condition.       27         8.11       Evidence of Financial Arrangements.       27         9.01       Owner's Representative       27         9.02       Visits to Site       27         9.03       Project Representative       27         9.04       Authorized Variations in Work.       27         9.05       Rejecting Defective Work.       28         9.07       Determinations of Duit Price Work.       28         9.08       Decisions on Requirements of Contract Documents and Acceptability of Work       28         9.09       Limitations on Engineer's Authorized Aranges in the Work.       29         10.01       Authorized Changes in the Work.			
8.02       Replacement of Engineer       26         8.03       Furnish Data.       26         8.04       Pay When Due       26         8.05       Lands and Easement; Reports and Tests.       26         8.06       Insurance       26         8.07       Change Orders.       26         8.08       Inspections, Tests, and Approvals.       26         8.09       Limitations on Owner's Responsibilities.       27         8.10       Undiscosed Hazardous Environmental Condition.       27         8.11       Evidence of Financial Arrangements.       27         9.10       Owner's Representative       27         9.01       Owner's Representative       27         9.02       Visits to Site       27         9.03       Project Representative       27         9.04       Authorized Variations in Work       27         9.05       Rejecting Defective Work.       28         9.06       Determinations for Unit Price Work       28         9.07       Determinations on Engineer's Authority and Responsibilities.       28         9.08       Lecisions on Requirements of Contract Documents and Acceptability of Work.       28         9.09       Limitations to Engineer's Authority and Res			
8.03       Firmish Data       26         8.04       Pay When Due       26         8.05       Lands and Easements; Reports and Tests       26         8.06       Insurance       26         8.07       Change Orders.       26         8.09       Limitations on Owner's Responsibilities       26         8.09       Limitations on Owner's Responsibilities       27         8.10       Undisclosed Hazardous Environmental Condition       27         8.11       Evidence of Financial Arrangements.       27         9.01       Owner's Representative       27         9.02       Visits to Site       27         9.03       Project Representative       27         9.04       Authorized Variations in Work       27         9.05       Rejecting Defective Work.       28         9.06       Shop Drawings, Change Orders and Payments.       28         9.07       Determinations on Engineer's Authority and Responsibilities.       28         9.08       Decisions on Requirements of Contract Documents and Acceptability of Work       28         9.09       Limitations on Engineer's Authority and Responsibilities.       28         9.00       Limitations on Engineer's Authority and Responsibilities.       29			
8.04       Pay When Due       26         8.05       Lands and Easements; Reports and Tests       26         8.06       Insurance       26         8.07       Change Orders.       26         8.08       Inspections, Tests, and Approvals.       26         8.08       Inspections, Tests, and Approvals.       26         8.09       Limitations on Owner's Responsibilities       27         8.11       Evidence of Financial Arrangements.       27         8.11       Evidence of Financial Arrangements.       27         9.01       Owner's Representative       27         9.02       Visits to Site       27         9.03       Project Representative       27         9.04       Authorized Variations in Work.       27         9.05       Rejecting Defective Work.       27         9.06       Shop Drawings, Change Orders and Payments.       28         9.07       Determinations for Unit Price Work.       28         9.08       Decisions on Requirements of Contract Documents and Acceptability of Work.       28         9.09       Limitations on Engineer's Authority and Responsibilities.       28         9.00       Limitations to Surety.       29         9.01       Authorized Chan			
8.05       Lands and Easements; Reports and Tests.       26         8.06       Inspections, Tests, and Approvals.       26         8.07       Change Orders.       26         8.08       Inspections, Tests, and Approvals.       26         8.09       Limitations on Owner's Represensibilities       27         8.10       Undisclosed Hazardous Environmental Condition.       27         8.11       Evidence of Financial Arrangements.       27         9.01       Owner's Representative       27         9.02       Visits to Site       27         9.03       Project Representative       27         9.04       Authorized Variations in Work       27         9.05       Rejecting Defective Work       27         9.06       Shop Drawings, Change Orders and Payments.       27         9.07       Determinations for Unit Price Work       28         9.08       Decisions on Requirements of Courtact Documents and Acceptability of Work       28         9.09       Limitations on Engineer's Authority and Responsibilities       28         9.00       Authorized Changes in the Work       28         10.01       Authorized Changes in the Work       29         10.02       Unauthorized Changes in the Work       29			
806       Insurance       26         8.07       Change Orders.       26         8.08       Inspections, Fests, and Approvals       26         8.09       Limitations on Owner's Responsibilities       27         8.10       Undisclosed Hardardous Environmental Condition       27         8.11       Evidence of Financial Arrangements       27         9.11       Owner's Representative       27         9.02       Visits to Site       27         9.03       Project Representative       27         9.04       Authorized Variations in Work       27         9.05       Rejecting Defective Work       27         9.06       Shop Drawings, Change Orders and Payments       28         9.07       Determinations for Unit Price Work       28         9.08       Decisions on Requirements of Contract Documents and Acceptability of Work       28         9.09       Limitations on Engineer's Authority and Responsibilities       28         10.01       Authorized Changes in the Work       29         10.02       Unauthorized Changes in the Work       29         10.03       Evention of Change Orders       29         10.04       Notification to Surety       29         10.05       Claim			
8.07       Change Orders.       26         8.08       Inspections, Tests, and Approvals.       26         8.09       Limitations on Owner's Responsibilities       27         8.10       Undisclosed Hazardous Environmental Condition.       27         8.11       Evidence of Financial Arrangements.       27         ARTICLE 9 - ENGINEER'S STATUS DURING CONSTRUCTION.       27         9.01       Owner's Representative       27         9.02       Visits to Site       27         9.03       Project Representative       27         9.04       Authorized Variations in Work       27         9.05       Rejecting Defective Work       27         9.06       Shop Drawings, Charge Orders and Payments       27         9.07       Determinations for Unit Price Work       28         9.08       Decisions on Requirements of Contract Documents and Acceptability of Work       28         9.08       Decisions on Requirements of Contract Documents and Acceptability of Work       28         9.09       Limitations on Engineer's Authority and Responsibilities       28         9.001       Authorized Changes in the Work       28         1002       Hounathorized Changes in the Work       29         10.03       Execution of Change Orders <td></td> <td></td> <td></td>			
8.08       Inspections, Tests, and Approvals.       26         8.09       Limitations on Owner's Responsibilities       27         8.10       Undisclosed Hazardous Environmental Condition.       27         8.11       Evidence of Financial Arrangements.       27         9.01       Owner's Representative       27         9.02       Visits to Site       27         9.03       Project Representative       27         9.04       Authorized Variations in Work       27         9.05       Rejecting Defective Work       27         9.06       Shop Drawings, Change Orders and Payments       28         9.07       Determinations for Unit Price Work       28         9.08       Decisions on Requirements of Contract Documents and Acceptability of Work       28         9.09       Limitations on Engineer's Authority and Responsibilities       28         9.09       Limitations on Engineer's Authority and Responsibilities       28         9.09       Limitations on Grages in the Work       28         10.01       Authorized Changes in the Work       29         10.02       Unauthorized Changes in the Work       29         10.03       Execution of Change Orders       29         10.04       Notification to Surery			
8.09       Limitations on Owner's Responsibilities       27         8.10       Undisclosed Hazardous Environmental Condition       27         8.11       Evidence of Financial Arrangements       27         ARTICLE 9 - ENGINEER'S STATUS DURING CONSTRUCTION       27         9.01       Owner's Representative       27         9.02       Visits to Site       27         9.03       Project Representative       27         9.04       Authorized Variations in Work       27         9.05       Rejecting Defective Work       27         9.06       Shop Drawings, Change Orders and Payments       27         9.07       Determinations for Unit Price Work       28         9.08       Decisions on Requirements of Contract Documents and Acceptability of Work       28         9.09       Limitations on Engineer's Authority and Responsibilities       28         10.01       Authorized Changes in the Work       28         10.02       Unauthorized Changes in the Work       29         10.03       Execution of Change Orders       29         10.04       Notification to Surety       29         10.05       Claims       29         10.04       Notification to Surety       29         10.05       C			
8.10       Undisclosed Hazardous Environmental Condition       27         8.11       Evidence of Financial Arrangements       27         9.11       Owner's Representative       27         9.02       Visits to Site       27         9.03       Project Representative       27         9.04       Authorized Variations in Work       27         9.05       Rejecting Defective Work       27         9.06       Shop Drawings, Change Orders and Payments       28         9.07       Determinations for Unit Price Work       28         9.08       Decisions on Requirements of Contract Documents and Acceptability of Work       28         9.09       Limitations on Engineer's Authority and Responsibilities       28         9.09       Limitations on Engineer's Authority and Responsibilities       28         10.01       Authorized Changes in the Work       29         10.02       Unauthorized Changes in the Work       29         10.03       Execution of Change Orders       29         10.04       Worlification to Surety       29         10.05       Claims       29         10.06       Claims       30         11.01       Cost of the Work       30         11.02       Allowances<			
8.11       Evidence of Financial Arrangements.       27         ARTICLE 9 - ENGINEER'S STATUS DURING CONSTRUCTION       27         9.01       Owner's Representative       27         9.02       Visits to Site       27         9.03       Project Representative       27         9.04       Authorized Variations in Work       27         9.05       Rejecting Defective Work.       27         9.06       Shop Drawings, Change Orders and Payments.       28         9.07       Determinations for Unit Price Work.       28         9.08       Decisions on Requirements of Contract Documents and Acceptability of Work       28         9.09       Limitations on Engineer's Authority and Responsibilities       28         9.09       Limitations on Engineer's Authority and Responsibilities       28         10.01       Authorized Changes in the Work       29         10.02       Linauthorized Changes on the Work       29         10.03       Execution of Change Orders       29         10.04       Notification to Surety       29         10.05       Claims       30         11.01       Cost of the Work       30         11.01       Cost of the Work       31         10.10       Cost of the W			
ARTICLE 9 - ENGINEER'S STATUS DURING CONSTRUCTION       27         9.01       Owner's Representative       27         9.02       Visits to Site       27         9.03       Project Representative       27         9.04       Authorized Variations in Work       27         9.05       Rejecting Defective Work       27         9.06       Shop Drawings, Change Orders and Payments       28         9.07       Determinations for Unit Price Work       28         9.08       Decisions on Requirements of Contract Documents and Acceptability of Work       28         9.09       Limitations on Engineer's Authority and Responsibilities       28         9.09       Limitations on Engineer's Authority and Responsibilities       28         10.01       Authorized Changes in the Work       28         10.02       Unauthorized Changes in the Work       29         10.03       Execution of Change Orders       29         10.04       Notification to Surety       29         10.05       Claims       29         10.04       Allowances       31         11.01       Cost of the Work       30         11.02       Allowances       31         11.03       Unit Price Work       32 <td></td> <td></td> <td></td>			
9.01Owner's Representative279.02Visits to Site279.03Project Representative279.04Authorized Variations in Work279.05Rejecting Defective Work279.06Shop Drawings, Change Orders and Payments289.07Determinations for Unit Price Work289.08Decisions on Requirements of Contract Documents and Acceptability of Work289.09Limitations on Engineer's Authority and Responsibilities28ARTICLE 10 - CHANGES IN THE WORK; CLAIMS2810.01Authorized Changes in the Work2810.02Unauthorized Changes in the Work2910.03Execution of Change Orders2910.04Notification to Surety2910.05Claims2911.01Cost of the Work3011.02Allowances3111.03Unit Price Work3112.02Change of Contract PRICE; CHANGE OF CONTRACT TIMES3212.01Change of Contract Price; CHANGE OF CONTRACT TIMES3313.01Notice of Defects3313.02Accests to Work3313.03Tests AND INSPECTIONS; CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK3313.04Uncovering Work3413.05Owner May Stop the Work3413.06Correction or Removal of Defective Work3413.09Owner May Stop the Work3513.09Owner May Correct Defective Work35 <td< td=""><td></td><td></td><td></td></td<>			
9.02Visits to Site279.03Project Representative279.04Authorized Variations in Work279.05Rejecting Defective Work.279.06Shop Drawings, Change Orders and Payments.289.07Determinations for Unit Price Work289.08Decisions on Requirements of Contract Documents and Acceptability of Work289.09Limitations on Engineer's Authority and Responsibilities.289.09Limitations on Engineer's Authority and Responsibilities.2810.01Authorized Changes in the Work2810.02Unauthorized Changes in the Work2910.03Execution of Change Orders.2910.04Notification to Surety2910.05Claims2910.06Claims3011.01Cost of the Work3011.02Allowances3111.03Unit Price Work31ARTICLE 12 - CHANGE OF CONTRACT PRICE; CHANGE OF CONTRACT TIMES3212.02Change of Contract Price3212.03Delays3313.04Uncovering Work3313.05Owner May Stop the Work3313.04Uncovering Work3413.05Owner May Stop the Work3413.06Correction or Removal of Defective Work3413.08Acceptance of Defective Work3513.09Owner May Stop the Work3513.09Owner May Correct Defective Work35 <t< td=""><td></td><td></td><td></td></t<>			
9.03Project Representative279.04Authorized Variations in Work279.05Rejecting Defective Work279.06Shop Drawings, Change Orders and Payments289.07Determinations for Unit Price Work289.08Decisions on Requirements of Contract Documents and Acceptability of Work289.09Imitations on Engineer's Authority and Responsibilities289.09Imitations on Engineer's Authority and Responsibilities2810.01Authorized Changes in the Work2810.02Unauthorized Changes in the Work2910.03Execution of Change Orders2910.04Notification to Surety2910.05Claims2910.04Notification to Surety2910.05Claims3011.01Cost of the Work3011.02Unauthorized Changes of Price3111.03Unit Price Work3111.03Unit Price Work3112.01Change of Contract PRICE; CHANGE OF CONTRACT TIMES3212.02Change of Contract Times3313.03Tests AND INSPECTIONS; CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK3313.04Uncovering Work3313.04Uncovering Work3413.05Owner May Stop the Work3413.06Correction Preiod3413.07Correction Preiod3413.08Acceptance of Defective Work3513.09Owner			
9.04Authorized Variations in Work279.05Rejecting Defective Work279.06Shop Drawings, Change Orders and Payments289.07Determinations for Unit Price Work289.08Decisions on Requirements of Contract Documents and Acceptability of Work289.09Limitations on Engineer's Authority and Responsibilities289.09Limitations on Engineer's Authority and Responsibilities289.09Limitations on Engineer's Authority and Responsibilities2810.01Authorized Changes in the Work2810.02Unauthorized Changes in the Work2910.03Execution of Change Orders2910.04Notification to Surety2910.05Claims2910.04Notification to Surety2910.05Claims3011.01Cost of the Work3011.02Allowances3111.03Unit Price Work3111.04Antrocke OF CONTRACT PRICE; CHANGE OF CONTRACT TIMES3212.01Change of Contract Price3212.02Change of Contract Times3313.03Notice of Defects3313.04Notice of Defects3313.05Owner May Stop the Work3413.06Correction Preiod3413.07Correction Period3413.08Acceptance of Defective Work3513.09Owner May Stop the Work3513.09Owner May Correct Defect			
9.05Rejecting Defective Work279.06Shop Drawings, Change Orders and Payments.289.07Determinations for Unit Price Work.289.08Decisions on Requirements of Contract Documents and Acceptability of Work289.09Limitations on Engineer's Authority and Responsibilities.289.01Authorized Changes in the Work2810.01Authorized Changes in the Work2810.02Unauthorized Changes in the Work2910.03Execution of Change Orders.2910.04Keyters2910.05Claims2910.05Claims2910.06Claims2910.07Claims3011.01Cost of the Work3011.02Allowances3111.03Unit Price Work3111.103Unit Price Work3112.01Change of Contract Price3212.02Change of Contract Times3313.03Delays3313.04Accest to Work3313.01Notice of Defects3313.02Accest to Work3313.03Tests and Inspections3313.04Uncovering Work3413.05Owner May Stop the Work3413.06Correction Period3413.07Correction Period3413.08Acceptance of Defective Work3513.09Owner May Correct Defective Work3513.09 <td< td=""><td></td><td></td><td></td></td<>			
9.06Shop Drawings, Change Orders and Payments.289.07Determinations for Unit Price Work.289.08Decisions on Requirements of Contract Documents and Acceptability of Work.289.09Limitations on Engineer's Authority and Responsibilities.289.01Authorized Changes in the Work.2810.02Unauthorized Changes in the Work.2910.03Execution of Change Orders.2910.04Notification to Surety.2910.05Claims.2910.06Claims.2910.07Claims.2910.08Cost of the Work3011.01Cost of the Work3011.02Allowances3111.03Unit Price Work3111.04Change of Contract Price; CHANGE OF CONTRACT TIMES.3212.01Change of Contract Price; CHANGE OF CONTRACT TIMES.3212.02Change of Contract Times3312.03Delays.3333ARTICLE 13 - TESTS AND INSPECTIONS; CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK.3313.01Notice of Defects.3313.02Access to Work.3413.04Uncovering Work.3413.05Owner May Stop the Work3413.06Correction Period.3413.07Correction Period.3413.08Acceptance of Defective Work.3513.09Owner May Stop the Work.3513.09Owner May Corect Defective Work.<			
9.07Determinations for Unit Price Work.289.08Decisions on Requirements of Contract Documents and Acceptability of Work289.09Limitations on Engineer's Authority and Responsibilities.289.01CHANGES IN THE WORK; CLAIMS2810.01Authorized Changes in the Work.2810.02Unauthorized Changes in the Work2910.03Execution of Change Orders.2910.04Notification to Surety.2910.05Claims2910.06Claims2910.07Cost of the Work3011.01Cost of the Work3011.02Allowances3111.03Unit Price Work3111.03Unit Price Work3112.02Change of Contract PRICE; CHANGE OF CONTRACT TIMES3212.03Delays3313.01Notice of Defects3313.02Access to Work3313.03Tests and Inspections, CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK3313.04Uncovering Work3413.05Owner May Stop the Work3413.06Correction or Removal of Defective Work3413.07Correction Preiod3413.08Acceptance of Defective Work3513.09Owner May Correct Defective Work3513.09Owner May Correct Defective Work3513.09Owner May Correct Defective Work3513.09Owner May Correct Defective Work36			
9.08       Decisions on Requirements of Contract Documents and Acceptability of Work       28         9.09       Limitations on Engineer's Authority and Responsibilities       28         ARTICLE 10 - CHANGES IN THE WORK; CLAIMS       28         10.01       Authorized Changes in the Work       28         10.02       Unauthorized Changes in the Work       29         10.03       Execution of Change Orders.       29         10.04       Notification to Surety       29         10.05       Claims       29         10.06       Claims       29         10.01       Cost of the Work       30         11.02       Allowances       31         11.03       Unit Price Work       31         11.03       Unit Price Work       31         11.03       Unit Price Work       31         12.02       Change of Contract PRICE; CHANGE OF CONTRACT TIMES       32         12.01       Change of Contract Times       33         12.02       Change of Contract Times       33         13.01       Notice of Defects       33         13.02       Allowances       33         13.03       Tests and Inspections       33         13.04       Uncovering Work       <			
9.09       Limitations on Engineer's Authority and Responsibilities       28         ARTICLE 10 - CHANGES IN THE WORK; CLAIMS       28         10.01       Authorized Changes in the Work       28         10.02       Unauthorized Changes in the Work       29         10.03       Execution of Change Orders.       29         10.04       Notification to Surety       29         10.05       Claims       29         10.01       Cost of THE WORK; ALLOWANCES; UNIT PRICE WORK       30         11.02       Allowances       31         11.03       Unit Price Work       30         11.04       Cost of the Work       31         11.05       Unit Price Work       31         11.01       Change of Contract PRICE; CHANGE OF CONTRACT TIMES       32         12.01       Change of Contract Trice       32         12.02       Change of Contract Trice       32         13.01       Notice of Defects       33         13.01       Notice of Defects       33         13.02       Access to Work       34         13.03       Tests and Inspections       33         13.04       Uncovering Work       34         13.05       Owner May Stop the Work       3			
ARTICLE 10 - CHANGES IN THE WORK; CLAIMS       28         10.01       Authorized Changes in the Work       28         10.02       Unauthorized Change in the Work       29         10.03       Execution of Change Orders.       29         10.04       Notification to Surety       29         10.05       Claims       29         10.06       Claims       29         10.07       Cost of the Work       30         11.01       Cost of the Work       30         11.02       Allowances       31         11.03       Unit Price Work       31         11.04       Change of CONTRACT PRICE; CHANGE OF CONTRACT TIMES       32         12.01       Change of Contract Price; CHANGE OF CONTRACT TIMES       33         12.02       Change of Contract Times       33         12.03       Delays       33         13.01       Notice of Defects       33         13.02       Access to Work       33         13.03       Tests and Inspections       33         13.04       Uncovering Work       34         13.05       Owner May Stop the Work       34         13.06       Correction or Removal of Defective Work       34         13.0			
10.01Authorized Changes in the Work2810.02Unauthorized Changes in the Work2910.03Execution of Change Orders2910.04Notification to Surety2910.05Claims29ARTICLE 11 - COST OF THE WORK; ALLOWANCES; UNIT PRICE WORK3011.01Cost of the Work3011.02Allowances3111.03Unit Price Work31ARTICLE 12 - CHANGE OF CONTRACT PRICE; CHANGE OF CONTRACT TIMES3212.01Change of Contract Price3212.02Change of Contract Times3312.03Delays3313.01Notice of Defects3313.02Access to Work3313.03Tests and Inspections3313.04Uncovering Work3413.05Owner May Stop the Work3413.06Correction or Removal of Defective Work3413.07Correction or Removal of Defective Work3413.08Acceptance of Defective Work3513.09Owner May Stop the			
10.02Unauthorized Changes in the Work2910.03Execution of Change Orders2910.04Notification to Surety2910.05Claims29ARTICLE 11 - COST OF THE WORK; ALLOWANCES; UNIT PRICE WORK3011.01Cost of the Work3011.02Allowances3111.03Unit Price Work3111.04Change of CONTRACT PRICE; CHANGE OF CONTRACT TIMES3212.01Change of Contract Price3212.02Change of Contract Times3331.03Delays3333.13.01Notice of Defects3333.303Tests and Inspections3333.304Uncovering Work3433.05Owner May Stop the Work3433.06Correction or Removal of Defective Work3433.07Acceptance of Defective Work3433.08Acceptance of Defective Work3434.307Orrection Period3435.09Owner May Correct Defective Work3536.14.01Schedule of Values36			
10.03Execution of Change Orders2910.04Notification to Surety2910.05Claims290ARTICLE 11 - COST OF THE WORK; ALLOWANCES; UNIT PRICE WORK3011.01Cost of the Work3011.02Allowances3111.03Unit Price Work3111.03Unit Price Work31200Change of CONTRACT PRICE; CHANGE OF CONTRACT TIMES3212.01Change of Contract Price3212.02Change of Contract Trimes3312.03Delays3333ARTICLE 13 - TESTS AND INSPECTIONS; CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK3313.01Notice of Defects3313.02Access to Work3313.03Tests and Inspections3313.04Uncovering Work3413.05Owner May Stop the Work3413.06Correction or Removal of Defective Work3413.07Correct of Defective Work3531.09Owner May Correct Defective Work3531.09Owner May Correct Defective Work3531.09Owner May Correct Defective Work3531.09Owner May Correct Defective Work3531.00Schedule of Values36			
10.04Notification to Surety2910.05Claims29ARTICLE 11 - COST OF THE WORK; ALLOWANCES; UNIT PRICE WORK3011.01Cost of the Work3011.02Allowances3111.03Unit Price Work31ARTICLE 12 - CHANGE OF CONTRACT PRICE; CHANGE OF CONTRACT TIMES3212.01Change of Contract Price3212.02Change of Contract Times3312.03Delays3334RTICLE 13 - TESTS AND INSPECTIONS; CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK3313.01Notice of Defects3313.02Access to Work3313.03Tests and Inspections3313.04Uncovering Work3413.05Owner May Stop the Work3413.06Correction Preiod3413.08Acceptance of Defective Work3513.09Owner May Correct Defective Work36<	10.02		
10.05Claims29ARTICLE 11 - COST OF THE WORK; ALLOWANCES; UNIT PRICE WORK3011.01Cost of the Work3011.02Allowances3111.03Unit Price Work31ARTICLE 12 - CHANGE OF CONTRACT PRICE; CHANGE OF CONTRACT TIMES3212.01Change of Contract Price3212.02Change of Contract Times3312.03Delays3313.04Notice of Defects3313.02Access to Work3313.03Tests and Inspections3313.04Uncovering Work3413.05Owner May Stop the Work3413.06Correction Period3413.07Correction Period3413.08Acceptance of Defective Work3513.09Owner May Stop the Work3513.09Owner May Correct Defective Work3513.09Owner May Stop the Work3513.09Owner May Correct Defective Work36	10.03		
ARTICLE 11 - COST OF THE WORK; ALLOWANCES; UNIT PRICE WORK.3011.01Cost of the Work3011.02Allowances3111.03Unit Price Work31ARTICLE 12 - CHANGE OF CONTRACT PRICE; CHANGE OF CONTRACT TIMES3212.01Change of Contract Price3212.02Change of Contract Times3312.03Delays33ARTICLE 13 - TESTS AND INSPECTIONS; CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK3313.01Notice of Defects3313.02Access to Work3313.03Tests and Inspections3313.04Uncovering Work3413.05Owner May Stop the Work3413.06Correction or Removal of Defective Work3413.08Acceptance of Defective Work3513.09Owner May Correct Defective Work3513.09Owner May Correct Defective Work3513.09Owner May Correct Defective Work3513.09Schedule of Values36	10.04		
11.01Cost of the Work3011.02Allowances3111.03Unit Price Work31ARTICLE 12 - CHANGE OF CONTRACT PRICE; CHANGE OF CONTRACT TIMES3212.01Change of Contract Price3212.02Change of Contract Times3312.03Delays33ARTICLE 13 - TESTS AND INSPECTIONS; CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK3313.01Notice of Defects3313.02Access to Work3313.03Tests and Inspections3313.04Uncovering Work3413.05Owner May Stop the Work3413.06Correction or Removal of Defective Work3413.08Acceptance of Defective Work3513.09Owner May Correct Defective Work3513.09Owner May Correct Defective Work3513.09Owner May Correct Defective Work3614.01Schedule of Values36			
11.02Allowances3111.03Unit Price Work31ARTICLE 12 - CHANGE OF CONTRACT PRICE; CHANGE OF CONTRACT TIMES3212.01Change of Contract Price3212.02Change of Contract Times3312.03Delays33ARTICLE 13 - TESTS AND INSPECTIONS; CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK3313.01Notice of Defects3313.02Access to Work3313.03Tests and Inspections3313.04Uncovering Work3413.05Owner May Stop the Work3413.06Correction or Removal of Defective Work3413.08Acceptance of Defective Work3513.09Owner May Correct Defective Work3513.09Owner May Correct Defective Work3513.09Owner May Correct Defective Work3513.09Owner May Correct Defective Work3614.01Schedule of Values36	ARTICLE	11 - COST OF THE WORK; ALLOWANCES; UNIT PRICE WORK	30
11.03Unit Price Work31ARTICLE 12 - CHANGE OF CONTRACT PRICE; CHANGE OF CONTRACT TIMES3212.01Change of Contract Price3212.02Change of Contract Times3312.03Delays33ARTICLE 13 - TESTS AND INSPECTIONS; CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK3313.01Notice of Defects3313.02Access to Work3313.03Tests and Inspections3313.04Uncovering Work3413.05Owner May Stop the Work3413.06Correction or Removal of Defective Work3413.08Acceptance of Defective Work3513.09Owner May Correct Defective Work3614.01Schedule of Values36	11.01	Cost of the Work	30
ARTICLE 12 - CHANGE OF CONTRACT PRICE; CHANGE OF CONTRACT TIMES3212.01Change of Contract Price3212.02Change of Contract Times3312.03Delays33ARTICLE 13 - TESTS AND INSPECTIONS; CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK3313.01Notice of Defects3313.02Access to Work3313.03Tests and Inspections3313.04Uncovering Work3413.05Owner May Stop the Work3413.06Correction or Removal of Defective Work3413.08Acceptance of Defective Work3513.09Owner May Correct Defective Work3513.09Owner May CONTRACTOR AND COMPLETION3614.01Schedule of Values36	11.02	Allowances	31
12.01Change of Contract Price3212.02Change of Contract Times3312.03Delays33ARTICLE 13 - TESTS AND INSPECTIONS; CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK3313.01Notice of Defects3313.02Access to Work3313.03Tests and Inspections3313.04Uncovering Work3413.05Owner May Stop the Work3413.06Correction or Removal of Defective Work3413.07Correction Period3413.08Acceptance of Defective Work3513.09Owner May Correct Defective Work35ARTICLE 14 - PAYMENTS TO CONTRACTOR AND COMPLETION3614.01Schedule of Values36	11.03	Unit Price Work	31
12.02Change of Contract Times3312.03Delays33ARTICLE 13 - TESTS AND INSPECTIONS; CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK3313.01Notice of Defects3313.02Access to Work3313.03Tests and Inspections3313.04Uncovering Work3413.05Owner May Stop the Work3413.06Correction or Removal of Defective Work3413.07Correction Period3413.08Acceptance of Defective Work3513.09Owner May Correct Defective Work35ARTICLE 14 - PAYMENTS TO CONTRACTOR AND COMPLETION3614.01Schedule of Values36	ARTICLE	12 - CHANGE OF CONTRACT PRICE; CHANGE OF CONTRACT TIMES	32
12.02Change of Contract Times3312.03Delays33ARTICLE 13 - TESTS AND INSPECTIONS; CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK3313.01Notice of Defects3313.02Access to Work3313.03Tests and Inspections3313.04Uncovering Work3413.05Owner May Stop the Work3413.06Correction or Removal of Defective Work3413.07Correction Period3413.08Acceptance of Defective Work3513.09Owner May Correct Defective Work35ARTICLE 14 - PAYMENTS TO CONTRACTOR AND COMPLETION3614.01Schedule of Values36	12.01	Change of Contract Price	32
12.03Delays33ARTICLE 13 - TESTS AND INSPECTIONS; CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK3313.01Notice of Defects3313.02Access to Work3313.03Tests and Inspections3313.04Uncovering Work3413.05Owner May Stop the Work3413.06Correction or Removal of Defective Work3413.07Correction Period3413.08Acceptance of Defective Work3513.09Owner May Correct Defective Work35ARTICLE 14 - PAYMENTS TO CONTRACTOR AND COMPLETION3614.01Schedule of Values36	12.02	Change of Contract Times	33
ARTICLE 13 - TESTS AND INSPECTIONS; CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK	12.03		
13.01Notice of Defects3313.02Access to Work3313.03Tests and Inspections3313.04Uncovering Work3413.05Owner May Stop the Work3413.06Correction or Removal of Defective Work3413.07Correction Period3413.08Acceptance of Defective Work3513.09Owner May Correct Defective Work35ARTICLE 14 - PAYMENTS TO CONTRACTOR AND COMPLETION3614.01Schedule of Values36	ARTICLE		
13.02Access to Work3313.03Tests and Inspections3313.04Uncovering Work3413.05Owner May Stop the Work3413.06Correction or Removal of Defective Work3413.07Correction Period3413.08Acceptance of Defective Work3513.09Owner May Correct Defective Work35ARTICLE 14 - PAYMENTS TO CONTRACTOR AND COMPLETION3614.01Schedule of Values36			
13.03Tests and Inspections3313.04Uncovering Work3413.05Owner May Stop the Work3413.06Correction or Removal of Defective Work3413.07Correction Period3413.08Acceptance of Defective Work3513.09Owner May Correct Defective Work35ARTICLE 14 - PAYMENTS TO CONTRACTOR AND COMPLETION3614.01Schedule of Values36	13.02		
13.04Uncovering Work.3413.05Owner May Stop the Work.3413.06Correction or Removal of Defective Work.3413.07Correction Period.3413.08Acceptance of Defective Work.3513.09Owner May Correct Defective Work.35ARTICLE 14 - PAYMENTS TO CONTRACTOR AND COMPLETION3614.01Schedule of Values.36			
13.05Owner May Stop the Work3413.06Correction or Removal of Defective Work3413.07Correction Period3413.08Acceptance of Defective Work3513.09Owner May Correct Defective Work35ARTICLE 14 - PAYMENTS TO CONTRACTOR AND COMPLETION3614.01Schedule of Values36			
13.06Correction or Removal of Defective Work.3413.07Correction Period.3413.08Acceptance of Defective Work.3513.09Owner May Correct Defective Work.35ARTICLE 14 - PAYMENTS TO CONTRACTOR AND COMPLETION3614.01Schedule of Values.36		•	
13.07Correction Period3413.08Acceptance of Defective Work3513.09Owner May Correct Defective Work35ARTICLE 14 - PAYMENTS TO CONTRACTOR AND COMPLETION3614.01Schedule of Values36			
13.08Acceptance of Defective Work3513.09Owner May Correct Defective Work35ARTICLE 14 - PAYMENTS TO CONTRACTOR AND COMPLETION3614.01Schedule of Values36			
13.09Owner May Correct Defective Work.35ARTICLE 14 - PAYMENTS TO CONTRACTOR AND COMPLETION3614.01Schedule of Values.36			
ARTICLE 14 - PAYMENTS TO CONTRACTOR AND COMPLETION       36         14.01       Schedule of Values       36			
14.01 Schedule of Values			
•			
	17.01	*	

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14.03Contractor's Warranty of Title3714.04Substantial Completion3714.05Partial Utilization3814.06Final Inspection3814.07Final Payment3814.08Final Completion Delayed3514.09Waiver of Claims3514.09Waiver of Claims3515.01Owner May Suspend Work3515.02Owner May Suspend Work3915.03Owner May Terminate for Cause3915.04Contractor May Stop Work or Terminate4015.04Contractor May Stop Work or Terminate4116.01Methods and Procedures4117.01Giving Notice4117.02Computation of Times4117.03Cumulative Remedies4117.04Survival of Obligations4117.05Controlling Law41	14.02	Progress Payments	36
14.05Partial Utilization3814.06Final Inspection3814.07Final Payment3814.08Final Completion Delayed3514.09Waiver of Claims3514.09Waiver of Claims3514.09Waiver of Claims3514.09Waiver of Claims3515.01Owner May Suspend Work3515.02Owner May Terminate for Cause3515.03Owner May Terminate For Convenience4015.04Contractor May Stop Work or Terminate4016.01Methods and Procedures4116.01Methods and Procedures4117.01Giving Notice4117.02Computation of Times4117.03Cumulative Remedies4117.04Survival of Obligations4117.05Controlling Law41	14.03	Contractor's Warranty of Title	37
14.05Partial Utilization3814.06Final Inspection3814.07Final Payment3814.08Final Completion Delayed3514.09Waiver of Claims3514.09Waiver of Claims3514.09Waiver of Claims3514.09Waiver of Claims3515.01Owner May Suspend Work3515.02Owner May Terminate for Cause3515.03Owner May Terminate For Convenience4015.04Contractor May Stop Work or Terminate4016.01Methods and Procedures4116.01Methods and Procedures4117.01Giving Notice4117.02Computation of Times4117.03Cumulative Remedies4117.04Survival of Obligations4117.05Controlling Law41	14.04	Substantial Completion	37
14.07Final Payment3814.08Final Completion Delayed3914.09Waiver of Claims3914.09Waiver of Claims39ARTICLE 15 - SUSPENSION OF WORK AND TERMINATION3915.01Owner May Suspend Work3915.02Owner May Terminate for Cause3915.03Owner May Terminate For Convenience4015.04Contractor May Stop Work or Terminate4015.04Contractor May Stop Work or Terminate4116.01Methods and Procedures4117.01Giving Notice4117.02Computation of Times4117.03Cumulative Remedies4117.04Survival of Obligations4117.05Controlling Law41	14.05		
14.07Final Payment3814.08Final Completion Delayed3914.09Waiver of Claims3914.09Waiver of Claims39ARTICLE 15 - SUSPENSION OF WORK AND TERMINATION3915.01Owner May Suspend Work3915.02Owner May Terminate for Cause3915.03Owner May Terminate For Convenience4015.04Contractor May Stop Work or Terminate4015.04Contractor May Stop Work or Terminate4116.01Methods and Procedures4117.01Giving Notice4117.02Computation of Times4117.03Cumulative Remedies4117.04Survival of Obligations4117.05Controlling Law41	14.06	Final Inspection	38
14.08Final Completion Delayed3514.09Waiver of Claims39ARTICLE 15 - SUSPENSION OF WORK AND TERMINATION3915.01Owner May Suspend Work3915.02Owner May Terminate for Cause3915.03Owner May Terminate For Convenience4015.04Contractor May Stop Work or Terminate4015.05Owner May Stop Work or Terminate4016.01Methods and Procedures4116.01Methods and Procedures4117.01Giving Notice4117.02Computation of Times4117.03Cumulative Remedies4117.04Survival of Obligations4117.05Controlling Law41	14.07		
ARTICLE 15 - SUSPENSION OF WORK AND TERMINATION.3915.01Owner May Suspend Work.3915.02Owner May Terminate for Cause.3915.03Owner May Terminate For Convenience.4015.04Contractor May Stop Work or Terminate40ARTICLE 16 - DISPUTE RESOLUTION.4116.01Methods and Procedures41ARTICLE 17 - MISCELLANEOUS4117.01Giving Notice4117.02Computation of Times4117.03Cumulative Remedies.4117.04Survival of Obligations4117.05Controlling Law41	14.08		
15.01Owner May Suspend Work.3915.02Owner May Terminate for Cause.3915.03Owner May Terminate For Convenience.4015.04Contractor May Stop Work or Terminate40ARTICLE 16 - DISPUTE RESOLUTION.4116.01Methods and Procedures41ARTICLE 17 - MISCELLANEOUS4117.01Giving Notice4117.02Computation of Times4117.03Cumulative Remedies.4117.04Survival of Obligations4117.05Controlling Law41	14.09	Waiver of Claims	39
15.02Owner May Terminate for Cause.3915.03Owner May Terminate For Convenience.4015.04Contractor May Stop Work or Terminate40ARTICLE 16 - DISPUTE RESOLUTION.4116.01Methods and Procedures41ARTICLE 17 - MISCELLANEOUS4117.01Giving Notice4117.02Computation of Times4117.03Cumulative Remedies.4117.04Survival of Obligations4117.05Controlling Law41	ARTICLE		
15.03Owner May Terminate For Convenience4015.04Contractor May Stop Work or Terminate40ARTICLE 16 - DISPUTE RESOLUTION4116.01Methods and Procedures41ARTICLE 17 - MISCELLANEOUS4117.01Giving Notice4117.02Computation of Times4117.03Cumulative Remedies4117.04Survival of Obligations4117.05Controlling Law41	15.01	Owner May Suspend Work	39
15.04Contractor May Stop Work or Terminate40ARTICLE 16 - DISPUTE RESOLUTION4116.01Methods and Procedures41ARTICLE 17 - MISCELLANEOUS4117.01Giving Notice4117.02Computation of Times4117.03Cumulative Remedies4117.04Survival of Obligations4117.05Controlling Law41	15.02	Owner May Terminate for Cause	39
ARTICLE 16 - DISPUTE RESOLUTION4116.01Methods and Procedures41ARTICLE 17 - MISCELLANEOUS4117.01Giving Notice4117.02Computation of Times4117.03Cumulative Remedies4117.04Survival of Obligations4117.05Controlling Law41	15.03	Owner May Terminate For Convenience	40
16.01Methods and Procedures41ARTICLE 17 - MISCELLANEOUS4117.01Giving Notice4117.02Computation of Times4117.03Cumulative Remedies4117.04Survival of Obligations4117.05Controlling Law41	15.04	Contractor May Stop Work or Terminate	40
ARTICLE 17 - MISCELLANEOUS4117.01Giving Notice4117.02Computation of Times4117.03Cumulative Remedies4117.04Survival of Obligations4117.05Controlling Law41	ARTICLE		
17.01Giving Notice4117.02Computation of Times4117.03Cumulative Remedies4117.04Survival of Obligations4117.05Controlling Law41	16.01	Methods and Procedures	41
17.02Computation of Times4117.03Cumulative Remedies4117.04Survival of Obligations4117.05Controlling Law41	ARTICLE		
17.02Computation of Times4117.03Cumulative Remedies4117.04Survival of Obligations4117.05Controlling Law41	17.01	Giving Notice	41
17.04Survival of Obligations4117.05Controlling Law41	17.02	Computation of Times	41
17.05 Controlling Law	17.03		
17.05 Controlling Law	17.04	Survival of Obligations	41
17.06 Headings 41	17.05	Controlling Law	41
17.00 Inclumings	17.06	Headings	41

#### **GENERAL CONDITIONS**

#### ARTICLE 1 - DEFINITIONS AND TERMINOLOGY

#### 1.01 Defined Terms

A. Wherever used in the Bidding Requirements or Contract Documents and printed with initial capital letters, the terms listed below will have the meanings indicated which are applicable to both the singular and plural thereof. In addition to terms specifically defined, terms with initial capital letters in the Contract Documents include references to identified articles and paragraphs, and the titles of other documents or forms.

1. *Addenda*--Written or graphic instruments issued prior to the opening of Bids which clarify, correct, or change the Bidding Requirements or the proposed Contract Documents.

2. *Agreement*--The written instrument which is evidence of the agreement between Owner and Contractor covering the Work.

3. *Application for Payment*--The form acceptable to Engineer which is to be used by Contractor during the course of the Work in requesting progress or final payments and which is to be accompanied by such supporting documentation as is required by the Contract Documents.

4. *Asbestos*--Any material that contains more than one percent asbestos and is friable or is releasing asbestos fibers into the air above current action levels established by the United States Occupational Safety and Health Administration.

5. *Bid* The offer or proposal of a Bidder submitted on the preseribed form setting forth the prices for the Work to be performed.

6. *Bidder*--The individual or entity who submits a Bid directly to Owner.

7. *Bidding Documents*—The Bidding Requirements and the proposed Contract Documents (including all Addenda).

8. Bidding Requirements--The Advertisement or Invitation to Bid, Instructions to Bidders, bid security of acceptable form, if any, and the Bid Form with any supplements. 9. Change Order - A document recommended by Engineer which is signed by Contractor and Owner and authorizes an addition, deletion, or revision in the Work or an adjustment in the Contract Price or the Contract Times, issued on or after the Effective Date of the Agreement.

10. *Claim*--A demand or assertion by Owner or Contractor seeking an adjustment of Contract Price or Contract Times, or both, or other relief with respect to the terms of the Contract. A demand for money or services by a third party is not a Claim.

11. *Contract*--The entire and integrated written agreement between the Owner and Contractor concerning the Work. The Contract supersedes prior negotiations, representations, or agreements, whether written or oral.

12. Contract Documents Those items so designated in the Agreement. Only printed or hard copies of the items listed in the Agreement are Contract Documents. Approved Shop Drawings, other Contractor's submittals, and the reports and drawings of subsurface and physical conditions are not Contract Documents.

13. *Contract Price*--The moneys payable by Owner to Contractor for completion of the Work in accordance with the Contract Documents as stated in the Agreement (subject to the provisions of Paragraph 11.03 in the case of Unit Price Work).

14. *Contract Times*--The number of days or the dates stated in the Agreement to: (i) achieve Milestones, if any, (ii) achieve Substantial Completion; and (iii) complete the Work so that it is ready for final payment as evidenced by Engineer's written recommendation of final payment.

15. *Contractor*--The individual or entity with whom Owner has entered into the Agreement.

16. *Cost of the Work*--See Paragraph 11.01.A for definition.

17. *Drawings*--That part of the Contract Documents prepared or approved by Engineer which graphically shows the scope, extent, and character of the Work to be performed by Contractor. Shop Drawings and other Contractor submittals are not Drawings as so defined.

18. *Effective Date of the Agreement*--The date indicated in the Agreement on which it becomes effective, but if no such date is indicated, it means the date on which the Agreement is signed and delivered by the last of the two parties to sign and deliver.

19. *Engineer*--The individual or entity named as such in the Agreement.

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20. Field Order--A written order issued by Engineer which requires minor changes in the Work but which does not involve a change in the Contract Price or the Contract Times.

21. General Requirements--Sections of Division 1 of the Specifications. The General Requirements pertain to all sections of the Specifications.

22. Hazardous Environmental Condition--The presence at the Site of Asbestos, PCBs, Petroleum, Hazardous Waste, or Radioactive Material in such quantities or circumstances that may present a substantial danger to persons or property exposed thereto in connection with the Work.

23. Hazardous Waste--The term Hazardous Waste shall have the meaning provided in Section 1004 of the Solid Waste Disposal Act (42 USC Section 6903) as amended from time to time.

24. Laws and Regulations; Laws or Regulations--Any and all applicable laws, rules, regulations, ordinanees, codes, and orders of any and all governmental bodies. agencies, authorities, and courts having jurisdiction.

25. Liens--Charges, security interests, or encumbrances upon Project funds, real property, or personal property.

26. Milestone--A principal event specified in the Contract Documents relating to an intermediate completion date or time prior to Substantial Completion of all the Work.

27. Notice of Award--The written notice by Owner to the Successful Bidder stating that upon timely compliance by the Successful Bidder with the conditions precedent listed therein, Owner will sign and deliver the Agreement.

28. Notice to Proceed--A written notice given by Owner to Contractor fixing the date on which the Contract Times will commence to run and on which Contractor shall start to perform the Work under the Contract Documents.

29. Owner--The individual or entity with whom Contractor has entered into the Agreement and for whom the Work is to be performed.

30. PCBs--Polychlorinated biphenyls.

31. Petroleum--Petroleum, including crude oil or any fraction thereof which is liquid at standard conditions of temperature and pressure (60 degrees Fahrenheit and 14.7 pounds per square inch absolute), such as oil, petroleum, fuel oil, oil sludge, oil refuse, gasoline, kerosene, and oil mixed with other non-Hazardous Waste and crude oils.

32. Progress Schedule--A schedule, prepared and maintained by Contractor, describing the sequence and duration of the activities comprising the Contractor's plan to accomplish the Work within the Contract Times.

33. Project--The total construction of which the Work to be performed under the Contract Documents may be the whole, or a part.

34. Project Manual--The bound documentary information prepared for bidding and constructing the Work. A listing of the contents of the Project Manual, which may be bound in one or more volumes, is contained in the table(s) of contents.

35. Radioactive Material--Source, special nuclear, or byproduct material as defined by the Atomic Energy Act of 1954 (42 USC Section 2011 et seq.) as amended from time to time.

36. Related Entity -- An officer, director, partner, employee, agent, consultant, or subcontractor.

37. Resident Project Representative--The authorized representative of Engineer who may be assigned to the Site or any part thereof.

38. Samples--Physical examples of materials, equipment, or workmanship that are representative of some portion of the Work and which establish the standards by which such portion of the Work will be judged.

39. Schedule of Submittals -- A schedule, prepared and maintained by Contractor, of required submittals and the time requirements to support scheduled performance of related construction activities.

40. Schedule of Values -- A schedule, prepared and maintained by Contractor, allocating portions of the Contract Price to various portions of the Work and used as the basis for reviewing Contractor's Applications for Payment.

41. Shop Drawings--All drawings, diagrams, illustrations, schedules, and other data or information which are specifically prepared or assembled by or for Contractor and submitted by Contractor to illustrate some portion of the Work.

42. Site--Lands or areas indicated in the Contract Documents as being furnished by Owner upon which the Work is to be performed, including rights-of-way and easements for access thereto, and such other lands furnished by Owner which are designated for the use of Contractor.

43. Specifications--That part of the Contract Documents consisting of written requirements for materials, equipment, systems, standards and workmanship as applied to the Work, and certain

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administrative requirements and procedural matters applicable thereto.

44. *Subcontractor*--An individual or entity having a direct contract with Contractor or with any other Subcontractor for the performance of a part of the Work at the Site.

45. Substantial Completion--The time at which the Work (or a specified part thereof) has progressed to the point where, in the opinion of Engineer, the Work (or a specified part thereof) is sufficiently complete, in accordance with the Contract Documents, so that the Work (or a specified part thereof) can be utilized for the purposes for which it is intended. The terms "substantially complete" and "substantially completed" as applied to all or part of the Work refer to Substantial Completion thereof.

## 46. Successful Bidder--The Bidder submitting a responsive Bid to whom Owner makes an award.

47. *Supplementary Conditions*--That part of the Contract Documents which amends or supplements these General Conditions.

48. *Supplier*--A manufacturer, fabricator, supplier, distributor, materialman, or vendor having a direct contract with Contractor or with any Subcontractor to furnish materials or equipment to be incorporated in the Work by Contractor or any Subcontractor.

49. Underground Facilities--All underground pipelines, conduits, ducts, cables, wires, manholes, vaults, tanks, tunnels, or other such facilities or attachments, and any encasements containing such facilities, including those that convey electricity, gases, steam, liquid petroleum products, telephone or other communications, cable television, water, wastewater, storm water, other liquids or chemicals, or traffic or other control systems.

50. *Unit Price Work*--Work to be paid for on the basis of unit prices.

51. *Work*--The entire construction or the various separately identifiable parts thereof required to be provided under the Contract Documents. Work includes and is the result of performing or providing all labor, services, and documentation necessary to produce such construction, and furnishing, installing, and incorporating all materials and equipment into such construction, all as required by the Contract Documents.

52. Work Change Directive--A written statement to Contractor issued on or after the Effective Date of the Agreement and signed by Owner and recommended by Engineer ordering an addition, deletion, or revision in the Work, or responding to differing or unforeseen subsurface or physical conditions under which the Work is to be performed or to emergencies. A Work Change Directive will not change the Contract Price or the Contract Times but is evidence that the parties expect that the change ordered or documented by a Work Change Directive will be incorporated in a subsequently issued Change Order following negotiations by the parties as to its effect, if any, on the Contract Price or Contract Times.

#### 1.02 Terminology

A. The following words or terms are not defined but, when used in the Bidding Requirements or Contract Documents, have the following meaning.

#### B. Intent of Certain Terms or Adjectives

1. The Contract Documents include the terms "as allowed," "as approved," "as ordered", "as directed" or terms of like effect or import to authorize an exercise of professional judgment by Engineer. In addition, the "reasonable," "suitable," adjectives "acceptable," "proper," "satisfactory," or adjectives of like effect or import are used to describe an action or determination of Engineer as to the Work. It is intended that such exercise of professional judgment, action or determination will be solely to evaluate, in general, the Work for compliance with the requirements of and information in the Contract Documents and conformance with the design concept of the completed Project as a functioning whole as shown or indicated in the Contract Documents (unless there is a specific statement indicating otherwise). The use of any such term or adjective is not intended to and shall not be effective to assign to Engineer any duty or authority to supervise or direct the performance of the Work or any duty or authority to undertake responsibility contrary to the provisions of Paragraph 9.09 or any other provision of the Contract Documents.

C. Day

1. The word "day" means a calendar day of 24 hours measured from midnight to the next midnight.

D. Defective

1. The word "defective," when modifying the word "Work," refers to Work that is unsatisfactory, faulty, or deficient in that it:

a. does not conform to the Contract Documents, or

b. does not meet the requirements of any applicable inspection, reference standard, test, or approval referred to in the Contract Documents, or

c. has been damaged prior to Engineer's recommendation of final payment (unless responsibility for the protection thereof has been assumed by Owner at Substantial Completion in accordance with Paragraph 14.04 or 14.05).

#### E. Furnish, Install, Perform, Provide

1. The word "furnish," when used in connection with services, materials, or equipment, shall mean to supply and deliver said services, materials, or equipment to the Site (or some other specified location) ready for use or installation and in usable or operable condition.

2. The word "install," when used in connection with services, materials, or equipment, shall mean to put into use or place in final position said services, materials, or equipment complete and ready for intended use.

3. The words "perform" or "provide," when used in connection with services, materials, or equipment, shall mean to furnish and install said services, materials, or equipment complete and ready for intended use.

4. When "furnish," "install," "perform," or "provide" is not used in connection with services, materials, or equipment in a context clearly requiring an obligation of Contractor, "provide" is implied.

F. Unless stated otherwise in the Contract Documents, words or phrases which have a well-known technical or construction industry or trade meaning are used in the Contract Documents in accordance with such recognized meaning.

#### **ARTICLE 2 - PRELIMINARY MATTERS**

#### 2.01 *Delivery of Bonds and Evidence of Insurance*

A. When Contractor delivers the executed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner such bonds as Contractor may be required to furnish.

B. Evidence of Insurance: Before any Work at the Site is started, Contractor and Owner shall each deliver to the other, with copies to each additional insured identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance which either of them or any additional insured may reasonably request) which Contractor and Owner respectively are required to purchase and maintain in accordance with Article 5.

#### 2.02 *Copies of Documents*

A. Owner shall furnish to Contractor up to ten printed or hard copies of the Drawings and Project Manual. Additional copies will be furnished upon request at the cost of reproduction.

2.03 Commencement of Contract Times; Notice to Proceed

A. The Contract Times will commence to run on the thirtieth day after the Effective Date of the Agreement

or, if a Notice to Proceed is given, on the day indicated in the Notice to Proceed. A Notice to Proceed may be given at any time within 30 days after the Effective Date of the Agreement. In no event will the Contract Times commence to run later than the sixtieth day after the day of Bid opening or the thirtieth day after the Effective Date of the Agreement, whichever date is earlier.

#### 2.04 *Starting the Work*

A. Contractor shall start to perform the Work on the date when the Contract Times commence to run. No Work shall be done at the Site prior to the date on which the Contract Times commence to run.

#### 2.05 Before Starting Construction

A. *Preliminary Schedules:* Within 10 days after the Effective Date of the Agreement (unless otherwise specified in the General Requirements), Contractor shall submit to Engineer for timely review:

1. a preliminary Progress Schedule; indicating the times (numbers of days or dates) for starting and completing the various stages of the Work, including any Milestones specified in the Contract Documents;

2. a preliminary Schedule of Submittals; and

3. a preliminary Schedule of Values for all of the Work which includes quantities and prices of items which when added together equal the Contract Price and subdivides the Work into component parts in sufficient detail to serve as the basis for progress payments during performance of the Work. Such prices will include an appropriate amount of overhead and profit applicable to each item of Work.

#### 2.06 *Preconstruction Conference*

A. Before any Work at the Site is started, a conference attended by Owner, Contractor, Engineer, and others as appropriate will be held to establish a working understanding among the parties as to the Work and to discuss the schedules referred to in Paragraph 2.05.A, procedures for handling Shop Drawings and other submittals, processing Applications for Payment, and maintaining required records.

#### 2.07 Initial Acceptance of Schedules

A. At least 10 days before submission of the first Application for Payment a conference attended by Contractor, Engineer, and others as appropriate will be held to review for acceptability to Engineer as provided below the schedules submitted in accordance with Paragraph 2.05.A. Contractor shall have an additional 10 days to make corrections and adjustments and to complete and resubmit the schedules. No progress payment shall be made to Contractor until acceptable schedules are submitted to Engineer.

EJCDC C-700 Standard General Conditions of the Construction Contract. Copyright © 2002 National Society of Professional Engineers for EJCDC. All rights reserved. 00700 - 8 1. The Progress Schedule will be acceptable to Engineer if it provides an orderly progression of the Work to completion within the Contract Times. Such acceptance will not impose on Engineer responsibility for the Progress Schedule, for sequencing, scheduling, or progress of the Work nor interfere with or relieve Contractor from Contractor's full responsibility therefor.

2. Contractor's Schedule of Submittals will be acceptable to Engineer if it provides a workable arrangement for reviewing and processing the required submittals.

3. Contractor's Schedule of Values will be acceptable to Engineer as to form and substance if it provides a reasonable allocation of the Contract Price to component parts of the Work.

ARTICLE 3 - CONTRACT DOCUMENTS: INTENT, AMENDING, REUSE

3.01 Intent

A. The Contract Documents are complementary; what is required by one is as binding as if required by all.

B. It is the intent of the Contract Documents to describe a functionally complete Project (or part thereof) to be constructed in accordance with the Contract Documents. Any labor, documentation, services, materials, or equipment that may reasonably be inferred from the Contract Documents or from prevailing custom or trade usage as being required to produce the intended result will be provided whether or not specifically called for at no additional cost to Owner.

C. Clarifications and interpretations of the Contract Documents shall be issued by Engineer as provided in Article 9.

2.02

3.02 *Reference Standards* 

A. Standards, Specifications, Codes, Laws, and Regulations

1. Reference to standards, specifications, manuals, or codes of any technical society, organization, or association, or to Laws or Regulations, whether such reference be specific or by implication, shall mean the standard, specification, manual, code, or Laws or Regulations in effect at the time of opening of Bids (or on the Effective Date of the Agreement if there were no Bids), except as may be otherwise specifically stated in the Contract Documents.

2. No provision of any such standard, specification, manual or code, or any instruction of a Supplier shall be effective to change the duties or responsibilities of Owner, Contractor, or Engineer, or any of their subcontractors, consultants, agents, or employees from those set forth in the Contract Documents. No such provision or instruction shall be effective to assign to Owner, or Engineer, or any of, their Related Entities, any duty or authority to supervise or direct the performance of the Work or any duty or authority to undertake responsibility inconsistent with the provisions of the Contract Documents.

## 3.03 Reporting and Resolving Discrepancies

A. Reporting Discrepancies

1. Contractor's Review of Contract Documents Before Starting Work: Before undertaking each part of the Work, Contractor shall carefully study and compare the Contract Documents and check and verify pertinent figures therein and all applicable field measurements. Contractor shall promptly report in writing to Engineer any conflict, error, ambiguity, or discrepancy which Contractor may discover and shall obtain a written interpretation or clarification from Engineer before proceeding with any Work affected thereby.

2. Contractor's Review of Contract Documents During Performance of Work: If, during the performance of the Work, Contractor discovers any conflict, error, ambiguity, or discrepancy within the Contract Documents or between the Contract Documents and any provision of any Law or Regulation applicable to the performance of the Work or of any standard, specification, manual or code, or of any instruction of any Supplier, Contractor shall promptly report it to Engineer in writing. Contractor shall not proceed with the Work affected thereby (except in an emergency as required by Paragraph 6.16.A) until an amendment or supplement to the Contract Documents has been issued by one of the methods indicated in Paragraph 3.04.

3. Contractor shall not be liable to Owner or Engineer for failure to report any conflict, error, ambiguity, or discrepancy in the Contract Documents unless Contractor knew or reasonably should have known thereof.

**B.** Resolving Discrepancies

1. Except as may be otherwise specifically stated in the Contract Documents, the provisions of the Contract Documents shall take precedence in resolving any conflict, error, ambiguity, or discrepancy between the provisions of the Contract Documents and:

> a. the provisions of any standard, specification, manual, code, or instruction (whether or not specifically incorporated by reference in the Contract Documents); or

> b. the provisions of any Laws or Regulations applicable to the performance of the Work

EJCDC C-700 Standard General Conditions of the Construction Contract. Copyright © 2002 National Society of Professional Engineers for EJCDC. All rights reserved. 00700 - 9 (unless such an interpretation of the provisions of the Contract Documents would result in violation of such Law or Regulation).

3.04 Amending and Supplementing Contract Documents

A. The Contract Documents may be amended to provide for additions, deletions, and revisions in the Work or to modify the terms and conditions thereof by either a Change Order or a Work Change Directive.

B. The requirements of the Contract Documents may be supplemented, and minor variations and deviations in the Work may be authorized, by one or more of the following ways:

1. A Field Order;

2. Engineer's approval of a Shop Drawing or Sample; (Subject to the provisions of Paragraph 6.17.D.3); or

3. Engineer's written interpretation or clarification.

3.05 *Reuse of Documents* 

A. Contractor and any Subcontractor or Supplier or other individual or entity performing or furnishing all of the Work under a direct or indirect contract with Contractor, shall not:

1. have or acquire any title to or ownership rights in any of the Drawings, Specifications, or other documents (or copies of any thereof) prepared by or bearing the seal of Engineer or Engineer's consultants, including electronic media editions; or

2. reuse any of such Drawings, Specifications, other documents, or copies thereof on extensions of the Project or any other project without written consent of Owner and Engineer and specific written verification or adaption by Engineer.

B. The prohibition of this Paragraph 3.05 will survive final payment, or termination of the Contract. Nothing herein shall preclude Contractor from retaining copies of the Contract Documents for record purposes.

#### 3.06 Electronic Data

A. Copies of data furnished by Owner or Engineer to Contractor or Contractor to Owner or Engineer that may be relied upon are limited to the printed copies (also known as hard copies). Files in electronic media format of text, data, graphics, or other types are furnished only for the convenience of the receiving party. Any conclusion or information obtained or derived from such electronic files will be at the user's sole risk. If there is a discrepancy between the electronic files and the hard copies, the hard copies govern.

B. Because data stored in electronic media format can deteriorate or be modified inadvertently or otherwise without authorization of the data's creator, the party receiving electronic files agrees that it will perform acceptance tests or procedures within 60 days, after which the receiving party shall be deemed to have accepted the data thus transferred. Any errors detected within the 60day acceptance period will be corrected by the transferring party.

C. When transferring documents in electronic media format, the transferring party makes no representations as to long term compatibility, usability, or readability of documents resulting from the use of software application packages, operating systems, or computer hardware differing from those used by the data's creator.

ARTICLE 4 - AVAILABILITY OF LANDS; SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS ENVIRONMENTAL CONDITIONS; REFERENCE POINTS

#### 4.01 Availability of Lands

A. Owner shall furnish the Site. Owner shall notify Contractor of any encumbrances or restrictions not of general application but specifically related to use of the Site with which Contractor must comply in performing the Work. Owner will obtain in a timely manner and pay for easements for permanent structures or permanent changes in existing facilities. If Contractor and Owner are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times, or both, as a result of any delay in Owner's furnishing the Site or a part thereof, Contractor may make a Claim therefor as provided in Paragraph 10.05.

B. Upon reasonable written request, Owner shall furnish Contractor with a current statement of record legal title and legal description of the lands upon which the Work is to be performed and Owner's interest therein as necessary for giving notice of or filing a mechanic's or construction lien against such lands in accordance with applicable Laws and Regulations.

C. Contractor shall provide for all additional lands and access thereto that may be required for temporary construction facilities or storage of materials and equipment. A. *Reports and Drawings:* The Supplementary Conditions identify:

1. those reports of explorations and tests of subsurface conditions at or contiguous to the Site that Engineer has used in preparing the Contract Documents; and

2. those drawings of physical conditions in or relating to existing surface or subsurface structures at or contiguous to the Site (except Underground Facilities) that Engineer has used in preparing the Contract Documents.

B. Limited Reliance by Contractor on Technical Data Authorized: Contractor may rely upon the general accuracy of the "technical data" contained in such reports and drawings, but such reports and drawings are not Contract Documents. Such "technical data" is identified in the Supplementary Conditions. Except for such reliance on such "technical data," Contractor may not rely upon or make any claim against Owner or Engineer, or any of their Related Entities with respect to:

1. the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor, and safety precautions and programs incident thereto; or

2. other data, interpretations, opinions, and information contained in such reports or shown or indicated in such drawings; or

3. any Contractor interpretation of or conclusion drawn from any "technical data" or any such other data, interpretations, opinions, or information.

4.03 Differing Subsurface or Physical Conditions

A. *Notice:* If Contractor believes that any subsurface or physical condition at or contiguous to the Site that is uncovered or revealed either:

1. is of such a nature as to establish that any "technical data" on which Contractor is entitled to rely as provided in Paragraph 4.02 is materially inaccurate; or

2. is of such a nature as to require a change in the Contract Documents; or

3. differs materially from that shown or indicated in the Contract Documents; or

4. is of an unusual nature, and differs materially from conditions ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract Documents;

then Contractor shall, promptly after becoming aware thereof and before further disturbing the subsurface or physical conditions or performing any Work in connection therewith (except in an emergency as required by Paragraph 6.16.A), notify Owner and Engineer in writing about such condition. Contractor shall not further disturb such condition or perform any Work in connection therewith (except as aforesaid) until receipt of written order to do so.

B. Engineer's Review: After receipt of written notice as required by Paragraph 4.03.A, Engineer will promptly review the pertinent condition, determine the necessity of Owner's obtaining additional exploration or tests with respect thereto, and advise Owner in writing (with a copy to Contractor) of Engineer's findings and eonclusions.

C. Possible Price and Times Adjustments

1. The Contract Price or the Contract Times, or both, will be equitably adjusted to the extent that the existence of such differing subsurface or physical condition causes an increase or decrease in Contractor's cost of, or time required for, performance of the Work; subject, however, to the following:

> a. such condition must meet any one or more of the categories described in Paragraph 4.03.A; and

> b. with respect to Work that is paid for on a Unit Price Basis, any adjustment in Contract Price will be subject to the provisions of Paragraphs 9.07 and 11.03.

2. Contractor shall not be entitled to any adjustment in the Contract Price or Contract Times if:

a. Contractor knew of the existence of such conditions at the time Contractor made a final commitment to Owner with respect to Contract Price and Contract Times by the submission of a Bid or becoming bound under a negotiated contract; or

b. the existence of such condition could reasonably have been discovered or revealed as a result of any examination, investigation, exploration, test, or study of the Site and contiguous areas required by the Bidding Requirements or Contract Documents to be conducted by or for Contractor prior to Contractor's making such final commitment; or e. Contractor failed to give the written notice as required by Paragraph 4.03.A.

3. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times, or both, a Claim may be made therefor as provided in Paragraph 10.05. However, Owner and Engineer, and any of their Related Entities shall not be liable to Contractor for any claims, costs, losses, or damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by Contractor on or in connection with any other project or anticipated project.

#### 4.04 Underground Facilities

A. Shown or Indicated: The information and data shown or indicated in the Contract Documents with respect to existing Underground Facilities at or contiguous to the Site is based on information and data furnished to Owner or Engineer by the owners of such Underground Facilities, including Owner, or by others. Unless it is otherwise expressly provided in the Supplementary Conditions:

1. Owner and Engineer shall not be responsible for the accuracy or completeness of any such information or data; and

2. the cost of all of the following will be included in the Contract Price, and Contractor shall have full responsibility for:

a. reviewing and checking all such information and data,

b. locating all Underground Facilities shown or indicated in the Contract Documents,

c. coordination of the Work with the owners of such Underground Facilities, including Owner, during construction, and

d. the safety and protection of all such Underground Facilities and repairing any damage thereto resulting from the Work.

#### B. Not Shown or Indicated

1. If an Underground Facility is uncovered or revealed at or contiguous to the Site which was not shown or indicated, or not shown or indicated with reasonable accuracy in the Contract Documents, Contractor shall, promptly after becoming aware thereof and before further disturbing conditions affected thereby or performing any Work in connection therewith (except in an emergency as required by Paragraph 6.16.A), identify the owner of such Underground Facility and give written notice to that owner and to Owner and Engineer. Engineer will promptly review the Underground Facility and determine the extent, if any, to which a change is required in the Contract Documents to reflect and document the consequences of the existence or location of the Underground Facility. During such time, Contractor shall be responsible for the safety and protection of such Underground Facility.

2. If Engineer concludes that a change in the Contract Documents is required, a Work Change Directive or a Change Order will be issued to reflect and document such consequences. An equitable adjustment shall be made in the Contract Price or Contract Times, or both, to the extent that they are attributable to the existence or location of any Underground Facility that was not shown or indicated or not shown or indicated with reasonable accuracy in the Contract Documents and that Contractor did not know of and could not reasonably have been expected to be aware of or to have anticipated. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment in Contract Price or Contract Times, Owner or Contractor may make a Claim therefor as provided in Paragraph 10.05.

#### 4.05 *Reference Points*

A. Owner shall provide engineering surveys to establish reference points for construction which in Engineer's judgment are necessary to enable Contractor to proceed with the Work. Contractor shall be responsible for laying out the Work, shall protect and preserve the established reference points and property monuments, and shall make no changes or relocations without the prior written approval of Owner. Contractor shall report to Engineer whenever any reference point or property monument is lost or destroyed or requires relocation because of necessary changes in grades or locations, and shall be responsible for the accurate replacement or relocation of such reference points or property monuments by professionally qualified personnel.

#### 4.06 *Hazardous Environmental Condition at Site*

A. *Reports and Drawings:* Reference is made to the Supplementary Conditions for the identification of those reports and drawings relating to a Hazardous Environmental Condition identified at the Site, if any, that have been utilized by the Engineer in the preparation of the Contract Documents.

B. Limited Reliance by Contractor on Technical Data Authorized: Contractor may rely upon the general accuracy of the "technical data" contained in such reports and drawings, but such reports and drawings are not Contract Documents. Such "technical data" is identified in the Supplementary Conditions. Except for such reliance on such "technical data," Contractor may not rely upon or make any claim against Owner or Engineer, or any of their Related Entities with respect to: 1. the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences and procedures of construction to be employed by Contractor and safety precautions and programs incident thereto; or

2. other data, interpretations, opinions and information contained in such reports or shown or indicated in such drawings; or

3. any Contractor interpretation of or conclusion drawn from any "technical data" or any such other data, interpretations, opinions or information.

C. Contractor shall not be responsible for any Hazardous Environmental Condition uncovered or revealed at the Site which was not shown or indicated in Drawings or Specifications or identified in the Contract Documents to be within the scope of the Work. Contractor shall be responsible for a Hazardous Environmental Condition created with any materials brought to the Site by Contractor, Subcontractors, Suppliers, or anyone else for whom Contractor is responsible.

D. If Contractor encounters a Hazardous Environmental Condition or if Contractor or anyone for whom Contractor is responsible creates a Hazardous Environmental Condition, Contractor shall immediately: (i) secure or otherwise isolate such condition; (ii) stop all Work in connection with such condition and in any area affected thereby (except in an emergency as required by Paragraph 6.16.A); and (iii) notify Owner and Engineer (and promptly thereafter confirm such notice in writing). Owner shall promptly consult with Engineer concerning the necessity for Owner to retain a qualified expert to evaluate such condition or take corrective action, if any.

E. Contractor shall not be required to resume Work in connection with such condition or in any affected area until after Owner has obtained any required permits related thereto and delivered to Contractor written notice: (i) specifying that such condition and any affected area is or has been rendered safe for the resumption of Work; or (ii) specifying any special conditions under which such Work may be resumed safely. If Owner and Contractor cannot agree as to entitlement to or on the amount or extent, if any, of any adjustment in Contract Price or Contract Times, or both, as a result of such Work stoppage or such special conditions under which Work is agreed to be resumed by Contractor, either party may make a Claim therefor as provided in Paragraph 10.05.

F. If after receipt of such written notice Contractor does not agree to resume such Work based on a reasonable belief it is unsafe, or does not agree to resume such Work under such special conditions, then Owner may order the portion of the Work that is in the area affected by such condition to be deleted from the Work. If Owner and Contractor cannot agree as to entitlement to or on the amount or extent, if any, of an adjustment in Contract Price or Contract Times as a result of deleting such portion of the Work, then either party may make a Claim therefor as provided in Paragraph 10.05. Owner may have such deleted portion of the Work performed by Owner's own forces or others in accordance with Article 7.

G. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, Subcontractors, and Engineer, and the officers. directors, partners, employees, agents, eonsultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to a Hazardous Environmental Condition, provided that such Hazardous Environmental Condition: (i) was not shown or indicated in the Drawings or Specifications or identified in the Contract Documents to be included within the scope of the Work, and (ii) was not created by Contractor or by anvone for whom Contractor is responsible. Nothing in this Paragraph 4.06. G shall obligate Owner to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.

H. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, employees. agents. consultants. partners. and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to a Hazardous Environmental Condition created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 4.06.H shall obligate Contractor to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.

I. The provisions of Paragraphs 4.02, 4.03, and 4.04 do not apply to a Hazardous Environmental Condition uncovered or revealed at the Site.

**ARTICLE 5 - BONDS AND INSURANCE** 

#### 5.01 *Performance, Payment, and Other Bonds*

A. Contractor shall furnish performance and payment bonds, each in an amount at least equal to the Contract Price as security for the faithful performance and payment of all of Contractor's obligations under the Contract Documents. These bonds shall remain in effect until one year after the date when final payment becomes due or until completion of the correction period specified in Paragraph 13.07, whichever is later, except as provided otherwise by Laws or Regulations or by the Contract Documents. Contractor shall also furnish such other bonds as are required by the Contract Documents.

B. All bonds shall be in the form prescribed by the Contract Documents except as provided otherwise by Laws or Regulations, and shall be executed by such sureties as are named in the current list of "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Circular 570 (amended) by the Financial Management Service, Surety Bond Branch, U.S. Department of the Treasury. All bonds signed by an agent must be accompanied by a certified copy of the agent's authority to act.

C. If the surety on any bond furnished by Contractor is declared bankrupt or becomes insolvent or its right to do business is terminated in any state where any part of the Project is located or it ceases to meet the requirements of Paragraph 5.01.B, Contractor shall promptly notify Owner and Engineer and shall, within 20 days after the event giving rise to such notification, provide another bond and surety, both of which shall comply with the requirements of Paragraphs 5.01.B and 5.02.

#### 5.02 Licensed Sureties and Insurers

A. All bonds and insurance required by the Contract Documents to be purchased and maintained by Owner or Contractor shall be obtained from surety or insurance companies that are duly licensed or authorized in the jurisdiction in which the Project is located to issue bonds or insurance policies for the limits and coverages so required. Such surety and insurance companies shall also meet such additional requirements and qualifications as may be provided in the Supplementary Conditions.

#### 5.03 *Certificates of Insurance*

A. Contractor shall deliver to Owner, with copies to each additional insured identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance requested by Owner or any other additional insured) which Contractor is required to purchase and maintain.

B. Owner shall deliver to Contractor, with copies to each additional insured identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance requested by Contractor or any other additional insured) which Owner is required to purchase and maintain.

#### 5.04 *Contractor's Liability Insurance*

A. Contractor shall purchase and maintain such liability and other insurance as is appropriate for the Work being performed and as will provide protection

from claims set forth below which may arise out of or result from Contractor's performance of the Work and Contractor's other obligations under the Contract Documents, whether it is to be performed by Contractor, any Subcontractor or Supplier, or by anyone directly or indirectly employed by any of them to perform any of the Work, or by anyone for whose acts any of them may be liable:

1. claims under workers' compensation, disability benefits, and other similar employee benefit acts;

2. claims for damages because of bodily injury, occupational sickness or disease, or death of Contractor's employees;

3. claims for damages because of bodily injury, sickness or disease, or death of any person other than Contractor's employees;

4. claims for damages insured by reasonably available personal injury liability coverage which are sustained:

a. by any person as a result of an offense directly or indirectly related to the employment of such person by Contractor, or

b. by any other person for any other reason;

5. claims for damages, other than to the Work itself, because of injury to or destruction of tangible property wherever located, including loss of use resulting therefrom; and

6. claims for damages because of bodily injury or death of any person or property damage arising out of the ownership, maintenance or use of any motor vehicle.

B. The policies of insurance required by this Paragraph 5.04 shall:

1. with respect to insurance required by Paragraphs 5.04.A.3 through 5.04.A.6 inclusive, include as additional insured (subject to any customary exclusion regarding professional liability) Owner and Engineer, and any other individuals or entities identified in the Supplementary Conditions, all of whom shall be listed as additional insureds, and include coverage for the respective officers, directors, partners, employees, agents, consultants and subcontractors of each and any of all such additional insureds, and the insurance afforded to these additional insureds shall provide primary coverage for all claims covered thereby;

2. include at least the specific coverages and be written for not less than the limits of liability provided in the Supplementary Conditions or required by Laws or Regulations, whichever is greater; 3. include completed operations insurance;

4. include contractual liability insurance covering Contractor's indemnity obligations under Paragraphs 6.11 and 6.20;

5. contain a provision or endorsement that the coverage afforded will not be canceled, materially changed or renewal refused until at least 30 days prior written notice has been given to Owner and Contractor and to each other additional insured identified in the Supplementary Conditions to whom a certificate of insurance has been issued (and the certificates of insurance furnished by the Contractor pursuant to Paragraph 5.03 will so provide);

6. remain in effect at least until final payment and at all times thereafter when Contractor may be correcting, removing, or replacing defective Work in accordance with Paragraph 13.07; and

7. with respect to completed operations insurance, and any insurance coverage written on a claimsmade basis, remain in effect for at least two years after final payment.

> a. Contractor shall furnish Owner and each other additional insured identified in the Supplementary Conditions, to whom a certificate of insurance has been issued, evidence satisfactory to Owner and any such additional insured of continuation of such insurance at final payment and one year thereafter.

5.05 *Owner's Liability Insurance* 

A. In addition to the insurance required to be provided by Contractor under Paragraph 5.04, Owner, at Owner's option, may purchase and maintain at Owner's expense Owner's own liability insurance as will protect Owner against claims which may arise from operations under the Contract Documents.

5.06 Property Insurance

A. Unless otherwise provided in the Supplementary Conditions, Owner shall purchase and maintain property insurance upon the Work at the Site in the amount of the full replacement cost thereof (subject to such deductible amounts as may be provided in the Supplementary Conditions or required by Laws and Regulations). This insurance shall:

1. include the interests of Owner, Contractor, Subcontractors, and Engineer, and any other individuals or entities identified in the Supplementary Conditions, and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them, each of whom is deemed to have an insurable interest and shall be listed as an insured or additional insured;

2. be written on a Builder's Risk "all-risk" or open peril or special causes of loss policy form that shall at least include insurance for physical loss or damage to the Work, temporary buildings, false work, and materials and equipment in transit, and shall insure against at least the following perils or causes of loss: fire, lightning, extended coverage, theft, vandalism and malicious collapse. mischief. earthquake, debris removal. demolition occasioned by enforcement of Laws and Regulations, water damage, (other than caused by flood) and such other perils or causes of loss as may be specifically required by the Supplementary Conditions;

3. include expenses incurred in the repair or replacement of any insured property (including but not limited to fees and charges of engineers and architects);

4. cover materials and equipment stored at the Site or at another location that was agreed to in writing by Owner prior to being incorporated in the Work, provided that such materials and equipment have been included in an Application for Payment recommended by Engineer;

5. allow for partial utilization of the Work by Owner;

6. include testing and startup; and

7. be maintained in effect until final payment is made unless otherwise agreed to in writing by Owner, Contractor, and Engineer with 30 days written notice to each other additional insured to whom a certificate of insurance has been issued.

B. Owner shall purchase and maintain such boiler and machinery insurance or additional property insurance as may be required by the Supplementary Conditions or Laws and Regulations which will include the interests of Owner, Contractor, Subcontractors, and Engineer, and any other individuals or entities identified in the Supplementary Conditions, and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them, each of whom is deemed to have an insurable interest and shall be listed as an insured or additional insured.

C. All the policies of insurance (and the certifieates or other evidence thereof) required to be purchased and maintained in accordance with Paragraph 5.06 will eontain a provision or endorsement that the coverage afforded will not be canceled or materially changed or renewal refused until at least 30 days prior written notice has been given to Owner and Contractor and to each other additional insured to whom a certificate of insurance has been issued and will contain waiver provisions in accordance with Paragraph 5.07.

D. Owner shall not be responsible for purchasing and maintaining any property insurance specified in this Paragraph 5.06 to protect the interests of Contractor, Subcontractors, or others in the Work to the extent of any deductible amounts that are identified in the Supplementary Conditions. The risk of loss within such identified deductible amount will be borne by Contractor, Subcontractors, or others suffering any such loss, and if any of them wishes property insurance coverage within the limits of such amounts, each may purchase and maintain it at the purchaser's own expense.

E. If Contractor requests in writing that other special insurance be included in the property insurance policies provided under Paragraph 5.06, Owner shall, if possible, include such insurance, and the cost thereof will be charged to Contractor by appropriate Change Order. Prior to commencement of the Work at the Site, Owner shall in writing advise Contractor whether or not such other insurance has been procured by Owner.

#### 5.07 Waiver of Rights

A. Owner and Contractor intend that all policies purchased in accordance with Paragraph 5.06 will protect Owner, Contractor, Subcontractors, and Engineer, and all other individuals or entities identified in the Supplementary Conditions to be listed as insureds or additional insureds (and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them) in such policies and will provide primary coverage for all losses and damages caused by the perils or causes of loss covered thereby. All such policies shall contain provisions to the effect that in the event of payment of any loss or damage the insurers will have no rights of recovery against any of the insureds or additional insureds thereunder. Owner and Contractor waive all rights against each other and their respective officers, directors, employees, **consultants** partners, agents. and subcontractors of each and any of them for all losses and damages caused by, arising out of or resulting from any of the perils or causes of loss covered by such policies and any other property insurance applicable to the Work; and, in addition, waive all such rights against Subcontractors, and Engineer, and all other individuals or entities identified in the Supplementary Conditions to be listed as insured or additional insured (and the officers, directors, employees, agents. **consultants** nartners. and subcontractors of each and any of them) under such policies for losses and damages so caused. None of the above waivers shall extend to the rights that any party making such waiver may have to the proceeds of insurance held by Owner as trustee or otherwise payable under any policy so issued.

B. Owner waives all rights against Contractor, Subcontractors, and Engineer, and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them for: 1. loss due to business interruption, loss of use, or other consequential loss extending beyond direct physical loss or damage to Owner's property or the Work caused by, arising out of, or resulting from fire or other perils whether or not insured by Owner; and

2. loss or damage to the completed Project or part thereof caused by, arising out of, or resulting from fire or other insured peril or cause of loss covered by any property insurance maintained on the completed Project or part thereof by Owner during partial utilization pursuant to Paragraph 14.05, after Substantial Completion pursuant to Paragraph 14.04, or after final payment pursuant to Paragraph 14.07.

C. Any insurance policy maintained by Owner eovering any loss, damage or consequential loss referred to in Paragraph 5.07.B shall contain provisions to the effect that in the event of payment of any such loss, damage, or consequential loss, the insurers will have no rights of recovery against Contractor, Subcontractors, or Engineer, and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them.

#### 5.08 *Receipt and Application of Insurance Proceeds*

A. Any insured loss under the policies of insurance required by Paragraph 5.06 will be adjusted with Owner and made payable to Owner as fiduciary for the insureds, as their interests may appear, subject to the requirements of any applicable mortgage clause and of Paragraph 5.08.B. Owner shall deposit in a separate account any money so received and shall distribute it in accordance with such agreement as the parties in interest may reach. If no other special agreement is reached, the damaged Work shall be repaired or replaced, the moneys so received applied on account thereof, and the Work and the cost thereof covered by an appropriate Change Order .

B. Owner as fiduciary shall have power to adjust and settle any loss with the insurers unless one of the parties in interest shall object in writing within 15 days after the occurrence of loss to Owner's exercise of this power. If such objection be made, Owner as fiduciary shall make settlement with the insurers in accordance with such agreement as the parties in interest may reach. If no such agreement among the parties in interest is reached, Owner as fiduciary shall adjust and settle the loss with the insurers and, if required in writing by any party in interest, Owner as fiduciary shall give bond for the proper performance of such duties.

## 5.09 Acceptance of Bonds and Insurance; Option to Replace

A. If either Owner or Contractor has any objection to the coverage afforded by or other provisions of the bonds or insurance required to be purchased and maintained by the other party in accordance with Article 5 on the basis of non-conformance with the Contract

Documents, the objecting party shall so notify the other party in writing within 10 days after receipt of the certificates (or other evidence requested) required by Paragraph 2.01.B. Owner and Contractor shall each provide to the other such additional information in respect of insurance provided as the other may reasonably request. If either party does not purchase or maintain all of the bonds and insurance required of such party by the Contract Documents, such party shall notify the other party in writing of such failure to purchase prior to the start of the Work, or of such failure to maintain prior to any change in the required coverage. Without prejudice to any other right or remedy, the other party may elect to obtain equivalent bonds or insurance to protect such other party's interests at the expense of the party who was required to provide such coverage, and a Change Order shall be issued to adjust the Contract Price accordingly.

#### 5.10 Partial Utilization, Acknowledgment of Property Insurer

A. If Owner finds it necessary to occupy or use a portion or portions of the Work prior to Substantial Completion of all the Work as provided in Paragraph 14.05, no such use or occupancy shall commence before the insurers providing the property insurance pursuant to Paragraph 5.06 have acknowledged notice thereof and in writing effected any changes in coverage necessitated thereby. The insurers providing the property insurance shall consent by endorsement on the policy or policies, but the property insurance shall not be canceled or permitted to lapse on account of any such partial use or occupancy.

#### ARTICLE 6 - CONTRACTOR'S RESPONSIBILITIES

#### 6.01 Supervision and Superintendence

A. Contractor shall supervise, inspect, and direct the Work competently and efficiently, devoting such attention thereto and applying such skills and expertise as may be necessary to perform the Work in accordance with the Contract Documents. Contractor shall be solely responsible for the means, methods, techniques, sequences, and procedures of construction. Contractor shall not be responsible for the negligence of Owner or Engineer in the design or specification of a specific means, method, technique, sequence, or procedure of construction which is shown or indicated in and expressly required by the Contract Documents.

B. At all times during the progress of the Work, Contractor shall assign a competent resident superintendent who shall not be replaced without written notice to Owner and Engineer except under extraordinary eircumstances. The superintendent will be Contractor's representative at the Site and shall have authority to aet on behalf of Contractor. All communications given to or

## received from the superintendent shall be binding on Contractor.

#### 6.02 *Labor; Working Hours*

A. Contractor shall provide competent, suitably qualified personnel to survey and lay out the Work and perform construction as required by the Contract Documents. Contractor shall at all times maintain good discipline and order at the Site.

B. Except as otherwise required for the safety or protection of persons or the Work or property at the Site or adjacent thereto, and except as otherwise stated in the Contract Documents, all Work at the Site shall be performed during regular working hours. Contractor will not permit the performance of Work on a Saturday, Sunday, or any legal holiday without Owner's written consent (which will not be unreasonably withheld) given after prior written notice to Engineer.

#### 6.03 Services, Materials, and Equipment

A. Unless otherwise specified in the Contract Documents, Contractor shall provide and assume full responsibility for all services, materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water, sanitary facilities, temporary facilities, and all other facilities and incidentals necessary for the performance, testing, start-up, and completion of the Work.

B. All materials and equipment incorporated into the Work shall be as specified or, if not specified, shall be of good quality and new, except as otherwise provided in the Contract Documents. All special warranties and guarantees required by the Specifications shall expressly run to the benefit of Owner. If required by Engineer, Contractor shall furnish satisfactory evidence (including reports of required tests) as to the source, kind, and quality of materials and equipment.

C. All materials and equipment shall be stored, applied, installed, connected, erected, protected, used, cleaned, and conditioned in accordance with instructions of the applicable Supplier, except as otherwise may be provided in the Contract Documents.

#### 6.04 *Progress Schedule*

A. Contractor shall adhere to the Progress Schedule established in accordance with Paragraph 2.07 as it may be adjusted from time to time as provided below. 1. Contractor shall submit to Engineer for acceptance (to the extent indicated in Paragraph 2.07) proposed adjustments in the Progress Schedule that will not result in changing the Contract Times. Such adjustments will comply with any provisions of the General Requirements applicable thereto.

2. Proposed adjustments in the Progress Schedule that will change the Contract Times shall be submitted in accordance with the requirements of Article 12. Adjustments in Contract Times may only be made by a Change Order.

6.05 Substitutes and "Or-Equals"

A. Whenever an item of material or equipment is specified or described in the Contract Documents by using the name of a proprietary item or the name of a particular Supplier, the specification or description is intended to establish the type, function, appearance, and quality required. Unless the specification or description contains or is followed by words reading that no like, equivalent, or "or-equal" item or no substitution is permitted, other items of material or equipment or material or equipment of other Suppliers may be submitted to Engineer for review under the circumstances described below.

1. "Or-Equal" Items: If in Engineer's sole diserction an item of material or equipment proposed by Contractor is functionally equal to that named and sufficiently similar so that no change in related Work will be required, it may be considered by Engineer as an "or equal" item, in which case review and approval of the proposed item may, in Engineer's sole discretion, be accomplished without compliance with some or all of the requirements for approval of proposed substitute items. For the purposes of this Paragraph 6.05.A.1, a proposed item of material or equipment will be considered functionally equal to an item so named if:

> a. in the exercise of reasonable judgment Engineer determines that:

> 1) it is at least equal in materials of construction, quality, durability, appearance, strength, and design characteristics;

2) it will reliably perform at least equally well the function and achieve the results imposed by the design concept of the completed Project as a functioning whole,

3) it has a proven record of performance and availability of responsive service; and

b. Contractor certifies that, if approved and incorporated into the Work:

1) there will be no increase in cost to the Owner or increase in Contract Times, and

# 2) it will conform substantially to the detailed requirements of the item named in the Contract Documents.

#### 2. Substitute Items

a. If in Engineer's sole discretion an item of material or equipment proposed by Contractor does not qualify as an "or-equal" item under Paragraph 6.05.A.1, it will be considered a proposed substitute item.

b. Contractor shall submit sufficient information as provided below to allow Engineer to determine that the item of material or equipment proposed is essentially equivalent to that named and an acceptable substitute therefor. Requests for review of proposed substitute items of material or equipment will not be accepted by Engineer from anyone other than Contractor.

c. The requirements for review by Engineer will be as set forth in Paragraph 6.05.A.2.d, as supplemented in the General Requirements and as Engineer may decide is appropriate under the circumstances.

d. Contractor shall make written application to Engineer for review of a proposed substitute item of material or equipment that Contractor seeks to furnish or use. The application:

1) shall certify that the proposed substitute item will:

a) perform adequately the functions and achieve the results called for by the general design,

b) be similar in substance to that specified, and

c) be suited to the same use as that specified;

#### 2) will state:

a) the extent, if any, to which the use of the proposed substitute item will prejudice Contractor's achievement of Substantial Completion on time;

b) whether or not use of the proposed substitute item in the Work will require a change in any of the Contract Documents (or in the provisions of any other direct contract with Owner for other work on the Project) to adapt the design to the proposed substitute item; and

EJCDC C-700 Standard General Conditions of the Construction Contract. Copyright © 2002 National Society of Professional Engineers for EJCDC. All rights reserved. 00700 - 18 c) whether or not incorporation or use of the proposed substitute item in connection with the Work is subject to payment of any license fee or royalty;

#### 3) will identify:

a) all variations of the proposed substitute item from that specified , and

b) available engineering, sales, maintenance, repair, and replacement services;

4) and shall contain an itemized estimate of all costs or credits that will result directly or indirectly from use of such substitute item, including costs of redesign and claims of other contractors affected by any resulting change,

B. Substitute Construction Methods or Procedures: If a specific means, method, technique, sequence, or procedure of construction is expressly required by the Contract Documents, Contractor may furnish or utilize a substitute means, method, technique, sequence, or procedure of construction approved (by) Engineer. Contractor shall submit sufficient information to allow Engineer, in Engineer's sole discretion, to determine that the substitute proposed is equivalent to that expressly called for by the Contract Documents. The requirements for review by Engineer will be similar to those provided in Paragraph 6.05.A.2.

C. Engineer's Evaluation: Engineer will be allowed a reasonable time within which to evaluate each proposal or submittal made pursuant to Paragraphs 6.05.A and 6.05.B. Engineer may require Contractor to furnish additional data about the proposed substitute item. Engineer will be the sole judge of acceptability. No "or equal" or substitute will be ordered, installed or utilized until Engineer's review is complete, which will be evidenced by either a Change Order for a substitute or an approved Shop Drawing for an "or equal." Engineer will advise Contractor in writing of any negative determination.

D. *Special Guarantee:* Owner may require Contractor to furnish at Contractor's expense a special performance guarantee or other surety with respect to any substitute.

E. Engineer's Cost Reimbursement: Engineer will record Engineer's costs in evaluating a substitute proposed or submitted by Contractor pursuant to Paragraphs 6.05.A.2 and 6.05.B Whether or not Engineer approves a substitute item so proposed or submitted by Contractor, Contractor shall reimburse Owner for the charges of Engineer for evaluating each such proposed substitute. Contractor shall also reimburse Owner for the charges of Engineer for making changes in the Contract Documents (or in the provisions of any other direct contract with Owner) resulting from the acceptance of each proposed substitute.

(F.) *Contractor's Expense*: Contractor shall provide all data in support of any proposed substitute or "or-equal" at Contractor's expense.

6.06 Concerning Subcontractors, Suppliers, and Others

A. Contractor shall not employ any Subcontractor, Supplier, or other individual or entity (including those acceptable to Owner as indicated in Paragraph 6.06.B), whether initially or as a replacement, against whom Owner may have reasonable objection. Contractor shall not be required to employ any Subcontractor, Supplier, or other individual or entity to furnish or perform any of the Work against whom Contractor has reasonable objection.

B. If the Supplementary Conditions require the identity of certain Subcontractors, Suppliers, or other individuals or entities to be submitted to Owner in advance for acceptance by Owner by a specified date prior to the Effective Date of the Agreement, and if Contractor has submitted a list thereof in accordance with the Supplementary Conditions, Owner's acceptance (either in writing or by failing to make written objection thereto by the date indicated for acceptance or objection in the Bidding Documents or the Contract Documents) of any such Subcontractor. Supplier, or other individual or entity so identified may be revoked on the basis of reasonable objection after due investigation. Contractor shall submit an acceptable replacement for the rejected Subcontractor, Supplier, or other individual or entity, and the Contract Price will be adjusted by the difference in the cost occasioned by such replacement, and an appropriate Change Order will be issued. No acceptance by Owner of any such Subcontractor, Supplier, or other individual or entity, whether initially or as a replacement, shall constitute a waiver of any right of Owner or Engineer to reject defective Work.

C. Contractor shall be fully responsible to Owner and Engineer for all acts and omissions of the Subcontractors, Suppliers, and other individuals or entities performing or furnishing any of the Work just as Contractor is responsible for Contractor's own acts and omissions. Nothing in the Contract Documents:

1. shall create for the benefit of any such Subcontractor, Supplier, or other individual or entity any contractual relationship between Owner or Engineer and any such Subcontractor, Supplier or other individual or entity, nor

2. shall anything in the Contract Documents create any obligation on the part of Owner or Engineer to pay or to see to the payment of any moneys due any such Subcontractor, Supplier, or other individual or entity except as may otherwise be required by Laws and Regulations.

D. Contractor shall be solely responsible for scheduling and coordinating the Work of Subcontractors, Suppliers, and other individuals or entities performing or furnishing any of the Work under a direct or indirect contract with Contractor.

E. Contractor shall require all Subcontractors, Suppliers, and such other individuals or entities performing or furnishing any of the Work to communicate with Engineer through Contractor.

F. The divisions and sections of the Specifications and the identifications of any Drawings shall not control Contractor in dividing the Work among Subcontractors or Suppliers or delineating the Work to be performed by any specific trade.

G. All Work performed for Contractor by a Subcontractor or Supplier will be pursuant to an approagreement between Contractor and priate the Subcontractor or Supplier which specifically binds the Subcontractor or Supplier to the applicable terms and conditions of the Contract Documents for the benefit of Owner and Engineer. Whenever any such agreement is with a Subcontractor or Supplier who is listed as an additional insured on the property insurance provided in Paragraph 5.06, the agreement between the Contractor and the Subcontractor or Supplier will contain provisions whereby the Subcontractor or Supplier waives all rights against Owner, Contractor, and Engineer,, and all other individuals or entities identified in the Supplementary Conditions to be listed as insureds or additional insureds (and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them) for all losses and damages caused by, arising out of, relating to, or resulting from any of the perils or causes of loss covered by such policies and any other property insurance applicable to the Work. If the insurers on any such policies require separate waiver forms to be signed by any Subcontractor or Supplier, Contractor will obtain the same.

#### 6.07 Patent Fees and Royalties

A. Contractor shall pay all license fees and royalties and assume all costs incident to the use in the performance of the Work or the incorporation in the Work of any invention, design, process, product, or device which is the subject of patent rights or copyrights held by others. If a particular invention, design, process, product, or device is specified in the Contract Documents for use in the performance of the Work and if to the actual knowledge of Owner or Engineer its use is subject to patent rights or copyrights calling for the payment of any license fee or royalty to others, the existence of such rights shall be disclosed by Owner in the Contract Documents.

B. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, <del>partners.</del> employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device not specified in the Contract Documents.

#### 6.08 Permits

A. Unless otherwise provided in the Supplementary Conditions, Contractor shall obtain and pay for all construction permits and licenses. Owner shall assist Contractor, when necessary, in obtaining such permits and licenses. Contractor shall pay all governmental charges and inspection fees necessary for the prosecution of the Work which are applicable at the time of opening of Bids, or, if there are no Bids, on the Effective Date of the Agreement. Owner shall pay all charges of utility owners for connections for providing permanent service to the Work.

#### 6.09 *Laws and Regulations*

A. Contractor shall give all notices required by and shall comply with all Laws and Regulations applicable to the performance of the Work. Except where otherwise expressly required by applicable Laws and Regulations, neither Owner nor Engineer shall be responsible for monitoring Contractor's compliance with any Laws or Regulations.

B. If Contractor performs any Work knowing or having reason to know that it is contrary to Laws or Regulations, Contractor shall bear all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such Work. However, it shall not be Contractor's primary responsibility to make certain that the Specifications and Drawings are in accordance with Laws and Regulations, but this shall not relieve Contractor of Contractor's obligations under Paragraph 3.03.

C. Changes in Laws or Regulations not known at the time of opening of Bids (or, on the Effective Date of the Agreement if there were no Bids) having an effect on the cost or time of performance of the Work shall be the subject of an adjustment in Contract Price or Contract Times. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment, a Claim may be made therefor as provided in Paragraph 10.05.

#### 6.10 Taxes

A. Contractor shall pay all sales, consumer, use, and other similar taxes required to be paid by Contractor in accordance with the Laws and Regulations of the place of the Project which are applicable during the performance of the Work.

#### 6.11 Use of Site and Other Areas

#### A. Limitation on Use of Site and Other Areas

1. Contractor shall confine construction equipment, the storage of materials and equipment, and the operations of workers to the Site and other areas permitted by Laws and Regulations, and shall not unreasonably encumber the Site and other areas with construction equipment or other materials or equipment. Contractor shall assume full responsibility for any damage to any such land or area, or to the owner or occupant thereof, or of any adjacent land or areas resulting from the performance of the Work.

2. Should any claim be made by any such owner or occupant because of the performance of the Work, Contractor shall promptly settle with such other party by negotiation or otherwise resolve the claim by arbitration or other dispute resolution proceeding or at law.

3. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any claim or action, legal or equitable, brought by any such owner or occupant against Owner, Engineer, or any other party indemnified hereunder to the extent caused by or based upon Contractor's performance of the Work.

B. *Removal of Debris During Performance of the Work:* During the progress of the Work Contractor shall keep the Site and other areas free from accumulations of waste materials, rubbish, and other debris. Removal and disposal of such waste materials, rubbish, and other debris shall conform to applicable Laws and Regulations.

C. *Cleaning:* Prior to Substantial Completion of the Work Contractor shall clean the Site and the Work and make it ready for utilization by Owner. At the completion of the Work Contractor shall remove from the Site all tools, appliances, construction equipment and machinery, and surplus materials and shall restore to original condition all property not designated for alteration by the Contract Documents. D. Loading Structures: Contractor shall not load nor permit any part of any structure to be loaded in any manner that will endanger the structure, nor shall Contractor subject any part of the Work or adjacent property to stresses or pressures that will endanger it.

#### 6.12 *Record Documents*

A. Contractor shall maintain in a safe place at the Site one record copy of all Drawings, Specifications, Addenda, Change Orders, Work Change Directives, Field Orders, and written interpretations and clarifications in good order and annotated to show changes made during construction. These record documents together with all approved Samples and a counterpart of all approved Shop Drawings will be available to Engineer for reference. Upon completion of the Work, these record documents, Samples, and Shop Drawings will be delivered to Engineer for Owner.

#### 6.13 Safety and Protection

A. Contractor shall be solely responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the Work. Contractor shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury or loss to:

1. all persons on the Site or who may be affected by the Work;

2. all the Work and materials and equipment to be incorporated therein, whether in storage on or off the Site; and

3. other property at the Site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, utilities, and Underground Facilities not designated for removal, relocation, or replacement in the course of construction.

B. Contractor shall comply with all applicable Laws and Regulations relating to the safety of persons or property, or to the protection of persons or property from damage, injury, or loss; and shall erect and maintain all necessary safeguards for such safety and protection. Contractor shall notify owners of adjacent property and of Underground Facilities and other utility owners when prosecution of the Work may affect them, and shall cooperate with them in the protection, removal, relocation, and replacement of their property.

C. All damage, injury, or loss to any property referred to in Paragraph 6.13.A.2 or 6.13.A.3 caused, directly or indirectly, in whole or in part, by Contractor, any Subcontractor, Supplier, or any other individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, shall be remedied by Contractor (except damage or loss attributable to the fault of Drawings or Specifications or to the acts or omissions of Owner or Engineer or, or anyone employed by any of them, or anyone for whose acts any of them may be liable, and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of Contractor or any Subcontractor, Supplier, or other individual or entity directly or indirectly employed by any of them).

D. Contractor's duties and responsibilities for safety and for protection of the Work shall continue until such time as all the Work is completed and Engineer has issued a notice to Owner and Contractor in accordance with Paragraph 14.07.B that the Work is acceptable (except as otherwise expressly provided in connection with Substantial Completion).

#### 6.14 *Safety Representative*

A. Contractor shall designate a qualified and experienced safety representative at the Site whose duties and responsibilities shall be the prevention of accidents and the maintaining and supervising of safety precautions and programs.

#### 6.15 Hazard Communication Programs

A. Contractor shall be responsible for coordinating any exchange of material safety data sheets or other hazard communication information required to be made available to or exchanged between or among employers at the Site in accordance with Laws or Regulations.

#### 6.16 *Emergencies*

A. In emergencies affecting the safety or protection of persons or the Work or property at the Site or adjacent thereto, Contractor is obligated to act to prevent threatened damage, injury, or loss. Contractor shall give Engineer prompt written notice if Contractor believes that any significant changes in the Work or variations from the Contract Documents have been caused thereby or are required as a result thereof. If Engineer determines that a change in the Contract Documents is required because of the action taken by Contractor in response to such an emergency, a Work Change Directive or Change Order will be issued.

#### 6.17 Shop Drawings and Samples

A. Contractor shall submit Shop Drawings and Samples to Engineer for review and approval in accordance with the acceptable Schedule of Submittals (as required by Paragraph 2.07). Each submittal will be identified as Engineer may require.

1. Shop Drawings

a. Submit number of copies specified in the General Requirements.

b. Data shown on the Shop Drawings will be complete with respect to quantities, dimensions, specified performance and design criteria, materials, and similar data to show Engineer the services, materials, and equipment Contractor proposes to provide and to enable Engineer to review the information for the limited purposes required by Paragraph 6.17.D.

2. *Samples:* Contractor shall also submit Samples to Engineer for review and approval in accordance with the acceptable schedule of Shop Drawings and Sample submittals.

a. Submit number of Samples specified in the Specifications.

b. Clearly identify each Sample as to material, Supplier, pertinent data such as catalog numbers, the use for which intended and other data as Engineer may require to enable Engineer to review the submittal for the limited purposes required by Paragraph 6.17.D.

B. Where a Shop Drawing or Sample is required by the Contract Documents or the Schedule of Submittals , any related Work performed prior to Engineer's review and approval of the pertinent submittal will be at the sole expense and responsibility of Contractor.

C. Submittal Procedures

1. Before submitting each Shop Drawing or Sample, Contractor shall have determined and verified:

a. all field measurements, quantities, dimensions, specified performance and design criteria, installation requirements, materials, catalog numbers, and similar information with respect thereto;

b. the suitability of all materials with respect to intended use, fabrication, shipping, handling, storage, assembly, and installation pertaining to the performance of the Work;

c. all information relative to Contractor's responsibilities for means, methods, techniques, sequences, and procedures of construction, and safety precautions and programs incident thereto; and

d. shall also have reviewed and coordinated each Shop Drawing or Sample with other Shop Drawings and Samples and with the requirements of the Work and the Contract Documents.

2. Each submittal shall bear a stamp or specific written certification that Contractor has satisfied Contractor's obligations under the Contract Documents

with respect to Contractor's review and approval of that submittal.

3. With each submittal, Contractor shall give Engineer specific written notice of any variations, that the Shop Drawing or Sample may have from the requirements of the Contract Documents. This notice shall be both a written communication separate from the Shop Drawing's or Sample Submittal; and, in addition, by a specific notation made on each Shop Drawing or Sample submitted to Engineer for review and approval of each such variation.

#### D. Engineer's Review

1. Engineer will provide timely review of Shop Drawings and Samples in accordance with the Schedule of Submittals acceptable to Engineer. Engineer's review and approval will be only to determine if the items covered by the submittals will, after installation or incorporation in the Work, conform to the information given in the Contract Documents and be compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents.

2. Engineer's review and approval will not extend to means, methods, techniques, sequences, or procedures of construction (except where a particular means, method, technique, sequence, or procedure of construction is specifically and expressly called for by the Contract Documents) or to safety precautions or programs incident thereto. The review and approval of a separate item as such will not indicate approval of the assembly in which the item functions.

3. Engineer's review and approval shall not relieve Contractor from responsibility for any variation from the requirements of the Contract Documents unless Contractor has complied with the requirements of Paragraph 6.17.C.3 and Engineer has given written approval of each such variation by specific written notation thereof incorporated in or accompanying the Shop Drawing or Sample. Engineer's review and approval shall not relieve Contractor from responsibility for complying with the requirements of Paragraph 6.17.C.1.

#### E. Resubmittal Procedures

1. Contractor shall make corrections required by Engineer and shall return the required number of corrected copies of Shop Drawings and submit, as required, new Samples for review and approval. Contractor shall direct specific attention in writing to revisions other than the corrections called for by Engineer on previous submittals.

#### 6.18 *Continuing the Work*

A. Contractor shall carry on the Work and adhere to the Progress Schedule during all disputes or

disagreements with Owner. No Work shall be delayed or postponed pending resolution of any disputes or disagreements, except as permitted by Paragraph 15.04 or as Owner and Contractor may otherwise agree in writing.

#### 6.19 *Contractor's General Warranty and Guarantee*

A. Contractor warrants and guarantees to Owner that all Work will be in accordance with the Contract Documents and will not be defective. Engineer and its Related Entities shall be entitled to rely on representation of Contractor's warranty and guarantee.

B. Contractor's warranty and guarantee hereunder excludes defects or damage caused by:

1. abuse, modification, or improper maintenance or operation by persons other than Contractor, Subcontractors, Suppliers, or any other individual or entity for whom Contractor is responsible; or

2. normal wear and tear under normal usage.

C. Contractor's obligation to perform and complete the Work in accordance with the Contract Documents shall be absolute. None of the following will constitute an acceptance of Work that is not in accordance with the Contract Documents or a release of Contractor's obligation to perform the Work in accordance with the Contract Documents:

1. observations by Engineer;

2. recommendation by Engineer or payment by Owner of any progress or final payment;

3. the issuance of a certificate of Substantial Completion by Engineer or any payment related thereto by Owner;

4. use or occupancy of the Work or any part thereof by Owner;

5. any review and approval of a Shop Drawing or Sample submittal or the issuance of a notice of acceptability by Engineer;

6. any inspection, test, or approval by others; or

7. any correction of defective Work by Owner.

#### 6.20 Indemnification

A. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or

EJCDC C-700 Standard General Conditions of the Construction Contract. Copyright © 2002 National Society of Professional Engineers for EJCDC. All rights reserved. arbitration or other dispute resolution costs) arising out of or relating to the performance of the Work, provided that any such claim, cost, loss, or damage is attributable to bodily injury, sickness, disease, or death, or to injury to or destruction of tangible property (other than the Work itself), including the loss of use resulting therefrom but only to the extent caused by any negligent act or omission of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work or anyone for whose acts any of them may be liable .

B. In any and all claims against Owner or Engineer or any of their respective consultants, agents, officers, directors, partners, or employees by any employee (or the survivor or personal representative of such employee) of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, the indemnification obligation under Paragraph 6.20.A shall not be limited in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for Contractor or any such Subcontractor, Supplier, or other individual or entity under workers' compensation acts, disability benefit acts, or other employee benefit acts.

C. The indemnification obligations of Contractor under Paragraph 6.20.A shall not extend to the liability of Engineer and Engineer's officers, directors, partners, employees, agents, consultants and subcontractors arising out of:

1. the preparation or approval of, or the failure to prepare or approve, maps, Drawings, opinions, reports, surveys, Change Orders, designs, or Specifications; or

2. giving directions or instructions, or failing to give them, if that is the primary cause of the injury or damage.

6.21 Delegation of Professional Design Services

A. Contractor will not be required to provide professional design services unless such services are specifically required by the Contract Documents for a portion of the Work or unless such services are required to carry out Contractor's responsibilities for construction means, methods, techniques, sequences and procedures. Contractor shall not be required to provide professional services in violation of applicable law.

B. If professional design services or certifications by a design professional related to systems, materials or equipment are specifically required of Contractor by the Contract Documents, Owner and Engineer will specify all performance and design criteria that such services must satisfy. Contractor shall cause such services or certifications to be provided by a properly licensed professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, Shop Drawings and other submittals prepared by such professional. Shop Drawings and other submittals related to the Work designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to Engineer.

C. Owner and Engineer shall be entitled to rely upon the adequacy, accuracy and completeness of the services, certifications or approvals performed by such design professionals, provided Owner and Engineer have specified to Contractor all performance and design criteria that such services must satisfy.

D. Pursuant to this Paragraph 6.21, Engineer's review and approval of design calculations and design drawings will be only for the limited purpose of checking for conformance with performance and design criteria given and the design concept expressed in the Contract Documents. Engineer's review and approval of Shop Drawings and other submittals (except design calculations and design drawings) will be only for the purpose stated in Paragraph 6.17.D.1.

E. Contractor shall not be responsible for the adequacy of the performance or design criteria required by the Contract Documents.

#### ARTICLE 7 - OTHER WORK AT THE SITE

#### 7.01 Related Work at Site

A. Owner may perform other work related to the Project at the Site with Owner's employees, or via other direct contracts therefor, or have other work performed by utility owners. If such other work is not noted in the Contract Documents, then:

1. written notice thereof will be given to Contractor prior to starting any such other work; and

2. if Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times that should be allowed as a result of such other work, a Claim may be made therefor as provided in Paragraph 10.05.

B. Contractor shall afford each other contractor who is a party to such a direct contract, each utility owner and Owner, if Owner is performing other work with Owner's employees, proper and safe access to the Site, a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such other work, and shall properly coordinate the Work with theirs. Contractor shall do all cutting, fitting, and patching of the Work that may be required to properly connect or otherwise make its several parts come together and properly integrate with such other work. Contractor shall not endanger any work of others by cutting, excavating, or otherwise altering their work and will only cut or alter their work with the written consent of Engineer and the others whose work will be affected. The duties and responsibilities of Contractor under this Paragraph are for the benefit of such utility owners and other contractors to the extent that there are comparable provisions for the benefit of Contractor in said direct contracts between Owner and such utility owners and other contractors.

C. If the proper execution or results of any part of Contractor's Work depends upon work performed by others under this Article 7, Contractor shall inspect such other work and promptly report to Engineer in writing any delays, defects, or deficiencies in such other work that render it unavailable or unsuitable for the proper execution and results of Contractor's Work. Contractor's failure to so report will constitute an acceptance of such other work as fit and proper for integration with Contractor's Work except for latent defects and deficiencies in such other work.

#### 7.02 Coordination

A. If Owner intends to contract with others for the performance of other work on the Project at the Site, the following will be set forth in Supplementary Conditions:

1. the individual or entity who will have authority and responsibility for coordination of the activities among the various contractors will be identified;

2. the specific matters to be covered by such authority and responsibility will be itemized; and

3. the extent of such authority and responsibilities will be provided.

B. Unless otherwise provided in the Supplementary Conditions, Owner shall have sole authority and responsibility for such coordination.

7.03 Legal Relationships

A. Paragraphs 7.01.A and 7.02 are not applicable for utilities not under the control of Owner.

B. Each other direct contract of Owner under Paragraph 7.01.A shall provide that the other contractor is liable to Owner and Contractor for the reasonable direct delay and disruption costs incurred by Contractor as a result of the other contractor's actions or inactions.

C. Contractor shall be liable to Owner and any other contractor for the reasonable direct delay and disruption costs incurred by such other contractor as a result of Contractor's action or inactions.

#### **ARTICLE 8 - OWNER'S RESPONSIBILITIES**

#### 8.01 *Communications to Contractor*

A. Except as otherwise provided in these General Conditions, Owner shall issue all communications to Contractor through Engineer.

#### 8.02 Replacement of Engineer

A. In case of termination of the employment of Engineer, Owner shall appoint an engineer to whom Contractor makes no reasonable objection, whose status under the Contract Documents shall be that of the former Engineer.

#### 8.03 Furnish Data

A. Owner shall promptly furnish the data required of Owner under the Contract Documents.

#### 8.04 Pay When Due

A. Owner shall make payments to Contractor when they are due as provided in Paragraphs 14.02.C and 14.07.C.

#### 8.05 Lands and Easements; Reports and Tests

A. Owner's duties in respect of providing lands and easements and providing engineering surveys to establish reference points are set forth in Paragraphs 4.01 and 4.05. Paragraph 4.02 refers to Owner's identifying and making available to Contractor copies of reports of explorations and tests of subsurface conditions and drawings of physical conditions in or relating to existing surface or subsurface structures at or contiguous to the Site that have been utilized by Engineer in preparing the Contract Documents.

#### 8.06 Insurance

A. Owner's responsibilities, if any, in respect to purchasing and maintaining liability and property insurance are set forth in Article 5.

#### 8.07 *Change Orders*

A. Owner is obligated to execute Change Orders as indicated in Paragraph 10.03.

#### 8.08 Inspections, Tests, and Approvals

A. Owner's responsibility in respect to certain inspections, tests, and approvals is set forth in Paragraph 13.03.B.

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#### 8.09 Limitations on Owner's Responsibilities

A. The Owner shall not supervise, direct, or have control or authority over, nor be responsible for, Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Owner will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.

## 8.10 Undisclosed Hazardous Environmental Condition

A. Owner's responsibility in respect to an undiselosed Hazardous Environmental Condition is set forth in Paragraph 4.06.

#### 8.11 Evidence of Financial Arrangements

A. If and to the extent Owner has agreed to furnish Contractor reasonable evidence that financial arrangements have been made to satisfy Owner's obligations under the Contract Documents, Owner's responsibility in respect thereof will be as set forth in the Supplementary Conditions.

## ARTICLE 9 - ENGINEER'S STATUS DURING CONSTRUCTION

#### 9.01 *Owner's Representative*

A. Engineer will be Owner's representative during the construction period. The duties and responsibilities and the limitations of authority of Engineer as Owner's representative during construction are set forth in the Contract Documents and will not be changed without written consent of Owner and Engineer.

#### 9.02 Visits to Site

A. Engineer will make visits to the Site at intervals appropriate to the various stages of construction as Engineer deems necessary in order to observe as an experienced and qualified design professional the progress that has been made and the quality of the various aspects of Contractor's executed Work. Based on information obtained during such visits and observations, Engineer, for the benefit of Owner, will determine, in general, if the Work is proceeding in accordance with the Contract Documents. Engineer will not be required to make exhaustive or continuous inspections on the Site to check the quality or quantity of the Work. Engineer's efforts will be directed toward providing for Owner a greater degree of confidence that the completed Work will conform generally to the Contract Documents. On the basis of such visits and observations, Engineer will keep

#### Owner informed of the progress of the Work and will endeavor to guard Owner against defective Work.

B. Engineer's visits and observations are subject to all the limitations on Engineer's authority and responsibility set forth in Paragraph 9.09. Particularly, but without limitation, during or as a result of Engineer's visits or observations of Contractor's Work Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work.

#### 9.03 *Project Representative*

A. If Owner and Engineer agree, Engineer will furnish a Resident Project Representative to assist Engineer in providing more extensive observation of the Work. The authority and responsibilities of any such Resident Project Representative and assistants will be as provided in the Supplementary Conditions, and limitations on the responsibilities thereof will be as provided in Paragraph 9.09. If Owner designates another representative or agent to represent Owner at the Site who is not Engineer's consultant, agent or employee, the responsibilities and authority and limitations thereon of such other individual or entity will be as provided in the Supplementary Conditions.

#### 9.04 Authorized Variations in Work

A. Engineer may authorize minor variations in the Work from the requirements of the Contract Documents which do not involve an adjustment in the Contract Price or the Contract Times and are compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. These may be accomplished by a Field Order and will be binding on Owner and also on Contractor, who shall perform the Work involved promptly. If Owner or Contractor believes that a Field Order justifies an adjustment in the Contract Price or Contract Times, or both, and the parties are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment , a Claim may be made therefor as provided in Paragraph 10.05.

#### 9.05 Rejecting Defective Work

A. Engineer will have authority to reject Work which Engineer believes to be defective, or that Engineer believes will not produce a completed Project that conforms to the Contract Documents or that will prejudice the integrity of the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. Engineer will also have authority to require special inspection or testing of the Work as provided in Paragraph 13.04, whether or not the Work is fabricated, installed, or completed.

#### 9.06 Shop Drawings, Change Orders and Payments

A. In connection with Engineer's authority, and limitations thereof, as to Shop Drawings and Samples, see Paragraph 6.17.

B. In connection with Engineer's authority, and limitations thereof, as to design calculations and design drawings submitted in response to a delegation of professional design services, if any, see Paragraph 6.21.

C. In connection with Engineer's authority as to Change Orders, see Articles 10, 11, and 12.

D. In connection with Engineer's authority as to Applications for Payment, see Article 14.

#### 9.07 Determinations for Unit Price Work

A. Engineer will determine the actual quantities and classifications of Unit Price Work performed by Contractor. Engineer will review with Contractor the Engineer's preliminary determinations on such matters before rendering a written decision thereon (by recommendation of an Application for Payment or otherwise). Engineer's written decision thereon will be final and binding (except as modified by Engineer to reflect changed factual conditions or more accurate data) upon Owner and Contractor, subject to the provisions of Paragraph 10.05.

9.08 Decisions on Requirements Contract of Documents and Acceptability of Work

A. Engineer will be the initial interpreter of the requirements of the Contract Documents and judge of the acceptability of the Work thereunder. All matters in question and other matters between Owner and Contractor arising prior to the date final payment is due relating to the acceptability of the Work, and the interpretation of the requirements of the Contract Documents pertaining to the performance of the Work, will be referred initially to Engineer in writing within 30 days of the event giving rise to the question

B. Engineer will, with reasonable promptness, render a written decision on the issue referred. If Owner or Contractor believe that any such decision entitles them to an adjustment in the Contract Price or Contract Times or both, a Claim may be made under Paragraph 10.05. The date of Engineer's decision shall be the date of the event giving rise to the issues referenced for the purposes of Paragraph 10.05.B.

C. Engineer's written decision on the issue referred will be final and binding on Owner and Contractor, subject to the provisions of Paragraph 10.05.

D. When functioning as interpreter and judge under this Paragraph 9.08, Engineer will not show

partiality to Owner or Contractor and will not be liable in connection with any interpretation or decision rendered in good faith in such capacity.

#### 9.09 Limitations on Engineer's Authority and Responsibilities

A. Neither Engineer's authority or responsibility under this Article 9 or under any other provision of the Contract Documents nor any decision made by Engineer in good faith either to exercise or not exercise such authority or responsibility or the undertaking, exercise, or performance of any authority or responsibility by Engineer shall create, impose, or give rise to any duty in contract, tort, or otherwise owed by Engineer to Contractor, any Subcontractor, any Supplier, any other individual or entity, or to any surety for or employee or agent of any of them.

B. Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Engineer will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.

C. Engineer will not be responsible for the acts or omissions of Contractor or of any Subcontractor, any Supplier, or of any other individual or entity performing any of the Work.

D. Engineer's review of the final Application for Payment and accompanying documentation and all maintenance and operating instructions, schedules, guarantees, bonds, certificates of inspection, tests and approvals, and other documentation required to be delivered by Paragraph 14.07.A will only be to determine generally that their content complies with the requirements of, and in the case of certificates of inspections, tests, and approvals that the results certified indicate compliance with the Contract Documents.

E. The limitations upon authority and responsibility set forth in this Paragraph 9.09 shall also apply to, the Resident Project Representative, if any, and assistants, if any.

ARTICLE 10 - CHANGES IN THE WORK; CLAIMS

#### 10.01 Authorized Changes in the Work

A. Without invalidating the Contract and without notice to any surety, Owner may, at any time or from time to time, order additions, deletions, or revisions in the Work by a Change Order, or a Work Change Directive. Upon receipt of any such document, Contractor shall

EJCDC C-700 Standard General Conditions of the Construction Contract. Copyright © 2002 National Society of Professional Engineers for EJCDC. All rights reserved. promptly proceed with the Work involved which will be performed under the applicable conditions of the Contract Documents (except as otherwise specifically provided).

B. If Owner and Contractor are unable to agree on entitlement to, or on the amount or extent, if any, of an adjustment in the Contract Price or Contract Times, or both, that should be allowed as a result of a Work Change Directive, a Claim may be made therefor as provided in Paragraph 10.05.

#### 10.02 Unauthorized Changes in the Work

A.Contractor shall not be entitled to an increase in the Contract Price or an extension of the Contract Times with respect to any work performed that is not required by the Contract Documents as amended, modified, or supplemented as provided in Paragraph 3.04, except in the case of an emergency as provided in Paragraph 6.16 or in the case of uncovering Work as provided in Paragraph 13.04.B.

#### 10.03 Execution of Change Orders

A. Owner and Contractor shall execute appropriate Change Orders recommended by Engineer covering:

1. changes in the Work which are: (i) ordered by Owner pursuant to Paragraph 10.01.A, (ii) required because of acceptance of defective Work under Paragraph 13.08.A or Owner's correction of defective Work under Paragraph 13.09, or (iii) agreed to by the parties;

2. changes in the Contract Price or Contract Times which are agreed to by the parties, including any undisputed sum or amount of time for Work actually performed in accordance with a Work Change Directive; and

3. changes in the Contract Price or Contract Times which embody the substance of any written decision rendered by Engineer pursuant to Paragraph 10.05; provided that, in lieu of executing any such Change Order, an appeal may be taken from any such decision in accordance with the provisions of the Contract Documents and applicable Laws and Regulations, but during any such appeal, Contractor shall carry on the Work and adhere to the Progress Schedule as provided in Paragraph 6.18.A.

#### 10.04 Notification to Surety

A. If notice of any change affecting the general scope of the Work or the provisions of the Contract Documents (including, but not limited to, Contract Price or Contract Times) is required by the provisions of any bond to be given to a surety, the giving of any such notice will be Contractor's responsibility. The amount of each applicable bond will be adjusted to reflect the effect of any such change.

#### 10.05 Claims

A. Engineer's Decision Required: All Claims, except those waived pursuant to Paragraph 14.09, shall be referred to the Engineer for decision. A decision by Engineer shall be required as a condition precedent to any exercise by Owner or Contractor of any rights or remedies either may otherwise have under the Contract Documents or by Laws and Regulations in respect of such Claims.

B. Notice: Written notice stating the general nature of each Claim, shall be delivered by the claimant to Engineer and the other party to the Contract promptly (but in no event later than 30 days) after the start of the event giving rise thereto. The responsibility to substantiate a Claim shall rest with the party making the Claim. Notice of the amount or extent of the Claim, with supporting data shall be delivered to the Engineer and the other party to the Contract within 60 days after the start of such event (unless Engineer allows additional time for claimant to submit additional or more accurate data in support of such Claim). A Claim for an adjustment in Contract Price shall be prepared in accordance with the provisions of Paragraph 12.01.B. A Claim for an adjustment in Contract Time shall be prepared in accordance with the provisions of Paragraph 12.02.B. Each Claim shall be accompanied by claimant's written statement that the adjustment elaimed is the entire adjustment to which the elaimant believes it is entitled as a result of said event. The opposing party shall submit any response to Engineer and the claimant within 30 days after receipt of the claimant's last submittal (unless Engineer allows additional time).

C. Engineer's Action: Engineer will review each Claim and, within 30 days after receipt of the last submittal of the claimant or the last submittal of the opposing party, if any, take one of the following actions in writing:

1. deny the Claim in whole or in part,

2. approve the Claim, or

3. notify the parties that the Engineer is unable to resolve the Claim if, in the Engineer's sole discretion, it would be inappropriate for the Engineer to do so. For purposes of further resolution of the Claim, such notice shall be deemed a denial.

D. In the event that Engineer does not take action on a Claim within said 30 days, the Claim shall be deemed denied.

E. Engineer's written action under Paragraph 10.05.C or denial pursuant to Paragraphs 10.05.C.3 or 10.05.D will be final and binding upon Owner and Contractor, unless Owner or Contractor invoke the dispute resolution procedure set forth in Article 16 within 30 days of such action or denial. F. No Claim for an adjustment in Contract Price or Contract Times will be valid if not submitted in accordance with this Paragraph 10.05.

ARTICLE 11 - COST OF THE WORK; ALLOWANCES; UNIT PRICE WORK

11.01 *Cost of the Work* 

A. *Costs Included:* The term Cost of the Work means the sum of all costs, except those excluded in Paragraph 11.01.B, necessarily incurred and paid by Contractor in the proper performance of the Work. When the value of any Work covered by a Change Order or when a Claim for an adjustment in Contract Price is determined on the basis of Cost of the Work, the costs to be reimbursed to Contractor will be only those additional or incremental costs required because of the change in the Work or because of the event giving rise to the Claim. Except as otherwise may be agreed to in writing by Owner, such costs shall be in amounts no higher than those prevailing in the locality of the Project, shall include only the following items, and shall not include any of the costs itemized in Paragraph 11.01.B.

1. Payroll costs for employees in the direct employ of Contractor in the performance of the Work under schedules of job classifications agreed upon by Owner and Contractor. Such employees shall include. without limitation, superintendents, foremen, and other personnel employed full time at the Site. Payroll costs for employees not employed full time on the Work shall be apportioned on the basis of their time spent on the Work. Payroll costs shall include, but not be limited to, salaries and wages plus the cost of fringe benefits, which shall include social security contributions, unemployment, excise, and payroll taxes, workers' compensation, health and retirement benefits, bonuses, sick leave, vacation and holiday pay applicable thereto. The expenses of performing Work outside of regular working hours, on Saturday, Sunday, or legal holidays, shall be included in the above to the extent authorized by Owner.

2. Cost of all materials and equipment furnished and incorporated in the Work, including costs of transportation and storage thereof, and Suppliers' field services required in connection therewith. All cash discounts shall accrue to Contractor unless Owner deposits funds with Contractor with which to make payments, in which case the cash discounts shall accrue to Owner. All trade discounts, rebates and refunds and returns from sale of surplus materials and equipment shall accrue to Owner, and Contractor shall make provisions so that they may be obtained.

3. Payments made by Contractor to Subcontractors for Work performed by Subcontractors. If required by Owner, Contractor shall obtain competitive bids from subcontractors acceptable to Owner and Contractor and shall deliver such bids to Owner, who will then determine, with the advice of Engineer, which bids, if any, will be acceptable. If any subcontract provides that the Subcontractor is to be paid on the basis of Cost of the Work plus a fee, the Subcontractor's Cost of the Work and fee shall be determined in the same manner as Contractor's Cost of the Work and fee as provided in this Paragraph 11.01.

4. Costs of special consultants (including but not limited to Engineers, architects, testing laboratories, surveyors, attorneys, and accountants) employed for services specifically related to the Work.

5. Supplemental costs including the following:

a. The proportion of necessary transportation, travel, and subsistence expenses of Contractor's employees incurred in discharge of duties connected with the Work.

b. Cost, including transportation and maintenance, of all materials, supplies, equipment, machinery, appliances, office, and temporary facilities at the Site, and hand tools not owned by the workers, which are consumed in the performance of the Work, and cost, less market value, of such items used but not consumed which remain the property of Contractor.

e. Rentals of all construction equipment and machinery, and the parts thereof whether rented from Contractor or others in accordance with rental agreements approved by Owner with the advice of Engineer, and the costs of transportation, loading, unloading, assembly, dismantling, and removal thereof. All such costs shall be in accordance with the terms of said rental agreements. The rental of any such equipment, machinery, or parts shall cease when the use thereof is no longer necessary for the Work.

d. Sales, consumer, use, and other similar taxes related to the Work, and for which Contractor is liable, imposed by Laws and Regulations.

e. Deposits lost for causes other than negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, and royalty payments and fees for permits and licenses.

f. Losses and damages (and related expenses) caused by damage to the Work, not compensated by insurance or otherwise, sustained by Contractor in connection with the performance of the Work (except losses and damages within the deductible amounts of property insurance established in accordance with (Paragraph 5.06.D), provided such losses and damages have resulted from causes other than the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable. Such losses shall include settlements made with the written consent and approval of Owner. No such losses, damages, and expenses shall be included in the Cost of the Work for the purpose of determining Contractor's fee.

g. The cost of utilities, fuel, and sanitary facilities at the Site.

h. Minor expenses such as telegrams, long distance telephone calls, telephone service at the Site, expresses, and similar petty eash items in connection with the Work.

i. The costs of premiums for all bonds and insurance Contractor is required by the Contract Documents to purchase and maintain.

B. *Costs Excluded:* The term Cost of the Work shall not include any of the following items:

1. Payroll costs and other compensation of Contractor's officers, executives, principals (of partnerships and sole proprietorships), general managers, safety managers, engineers, architects, estimators, attorneys, auditors, accountants, purchasing and contracting agents, expediters, timekeepers, clerks, and other personnel employed by Contractor, whether at the Site or in Contractor's principal or branch office for general administration of the Work and not specifically included in the agreed upon schedule of job classifications referred to in Paragraph 11.01.A.1 or specifically covered by Paragraph 11.01.A.4, all of which are to be considered administrative costs covered by the Contractor's fee.

2. Expenses of Contractor's principal and branch offices other than Contractor's office at the Site.

3. Any part of Contractor's capital expenses, including interest on Contractor's capital employed for the Work and charges against Contractor for delinquent payments.

4. Costs due to the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, including but not limited to, the correction of defective Work, disposal of materials or equipment wrongly supplied, and making good any damage to property.

5. Other overhead or general expense costs of any kind and the costs of any item not specifically and expressly included in Paragraphs 11.01.A and 11.01.B.

C. *Contractor's Fee:* When all the Work is performed on the basis of cost-plus, Contractor's fee shall

be determined as set forth in the Agreement. When the value of any Work covered by a Change Order or when a Claim for an adjustment in Contract Price is determined on the basis of Cost of the Work, Contractor's fee shall be determined as set forth in Paragraph 12.01.C.

D. *Documentation:* Whenever the Cost of the Work for any purpose is to be determined pursuant to Paragraphs 11.01.A and 11.01.B, Contractor will establish and maintain records thereof in accordance with generally accepted accounting practices and submit in a form acceptable to Engineer an itemized cost breakdown together with supporting data.

#### 11.02 Allowances

A. It is understood that Contractor has included in the Contract Price all allowances so named in the Contract Documents and shall cause the Work so covered to be performed for such sums and by such persons or entities as may be acceptable to Owner and Engineer.

B. Cash Allowances

1. Contractor agrees that:

a. the cash allowances include the cost to Contractor (less any applicable trade discounts) of materials and equipment required by the allowances to be delivered at the Site, and all applicable taxes; and

b. Contractor's costs for unloading and handling on the Site, labor, installation, overhead, profit, and other expenses contemplated for the cash allowances have been included in the Contract Price and not in the allowances, and no demand for additional payment on account of any of the foregoing will be valid.

C. Contingency Allowance

1. Contractor agrees that a contingency allowance, if any, is for the sole use of Owner to cover unanticipated costs.

D. Prior to final payment, an appropriate Change Order will be issued as recommended by Engineer to reflect actual amounts due Contractor on account of Work covered by allowances, and the Contract Price shall be correspondingly adjusted.

#### 11.03 Unit Price Work

A. Where the Contract Documents provide that all or part of the Work is to be Unit Price Work, initially the Contract Price will be deemed to include for all Unit Price Work an amount equal to the sum of the unit price for each separately identified item of Unit Price Work times the estimated quantity of each item as indicated in the Agreement.

EJCDC C-700 Standard General Conditions of the Construction Contract. Copyright © 2002 National Society of Professional Engineers for EJCDC. All rights reserved. 00700 - 30 B. The estimated quantities of items of Unit Price Work are not guaranteed and are solely for the purpose of comparison of Bids and determining an initial Contract Price. Determinations of the actual quantities and classifications of Unit Price Work performed by Contractor will be made by Engineer subject to the provisions of Paragraph 9.07.

C. Each unit price will be deemed to include an amount considered by Contractor to be adequate to cover Contractor's overhead and profit for each separately identified item.

D. Owner or Contractor may make a Claim for an adjustment in the Contract Price in accordance with Paragraph 10.05 if:

1. the quantity of any item of Unit Price Work performed by Contractor differs materially and significantly from the estimated quantity of such item indicated in the Agreement; and

2. there is no corresponding adjustment with respect any other item of Work; and

3. Contractor believes that Contractor is entitled to an increase in Contract Price as a result of having incurred additional expense or Owner believes that Owner is entitled to a decrease in Contract Price and the parties are unable to agree as to the amount of any such increase or decrease.

ARTICLE 12 - CHANGE OF CONTRACT PRICE; CHANGE OF CONTRACT TIMES

12.01 Change of Contract Price

A. The Contract Price may only be changed by a Change Order. Any Claim for an adjustment in the Contract Price shall be based on written notice submitted by the party making the Claim to the Engineer and the other party to the Contract in accordance with the provisions of Paragraph 10.05.

B. The value of any Work covered by a Change Order or of any Claim for an adjustment in the Contract Price will be determined as follows:

1. where the Work involved is covered by unit prices contained in the Contract Documents, by application of such unit prices to the quantities of the items involved (subject to the provisions of Paragraph 11.03); or

2. where the Work involved is not covered by unit prices contained in the Contract Documents, by a mutually agreed lump sum (which may include an allowance for overhead and profit not necessarily in accordance with Paragraph 12.01.C.2); or

3. where the Work involved is not covered by unit prices contained in the Contract Documents and agreement to a lump sum is not reached under Paragraph 12.01.B.2, on the basis of the Cost of the Work (determined as provided in Paragraph 11.01) plus a Contractor's fee for overhead and profit (determined as provided in Paragraph 12.01.C).

C. *Contractor's Fee:* The Contractor's fee for overhead and profit shall be determined as follows:

1. a mutually acceptable fixed fee; or

2. if a fixed fee is not agreed upon, then a fee based on the following percentages of the various portions of the Cost of the Work:

a. for costs incurred under Paragraphs 11.01.A.1 and 11.01.A.2, the Contractor's fee shall be 15 percent;

b. for costs incurred under Paragraph 11.01.A.3, the Contractor's fee shall be five percent;

e. where one or more tiers of subcontracts are on the basis of Cost of the Work plus a fee and no fixed fee is agreed upon, the intent of Paragraph 12.01.C.2.a is that the Subcontractor who actually performs the Work, at whatever tier, will be paid a fee of 15 percent of the costs incurred by such Subcontractor under Paragraphs 11.01.A.1 and 11.01.A.2 and that any higher tier Subcontractor and Contractor will each be paid a fee of five percent of the amount paid to the next lower tier Subcontractor;

d. no fee shall be payable on the basis of costs itemized under Paragraphs 11.01.A.4, 11.01.A.5, and 11.01.B;

e. the amount of credit to be allowed by Contractor to Owner for any change which results in a net decrease in cost will be the amount of the actual net decrease in cost plus a deduction in Contractor's fee by an amount equal to five percent of such net decrease; and

f. when both additions and credits are involved in (any) (one) (change, the) (adjustment) (in Contractor's fee shall be computed on the basis of the net change in accordance with Paragraphs 12.01.C.2.a through 12.01.C.2.e, inclusive.

12.02 Change of Contract Times

A. The Contract Times may only be changed by a Change Order. Any Claim for an adjustment in the Contract Times shall be based on written notice submitted by the party making the Claim to the Engineer and the other party to the Contract in accordance with the provisions of Paragraph 10.05.

B. Any adjustment of the Contract Times eovered by a Change Order or any Claim for an adjustment in the Contract Times will be determined in accordance with the provisions of this Article 12.

#### 12.03 Delays

A. Where Contractor is prevented from completing any part of the Work within the Contract Times due to delay beyond the control of Contractor, the Contract Times will be extended in an amount equal to the time lost due to such delay if a Claim is made therefor as provided in Paragraph 12.02.A. Delays beyond the control of Contractor shall include, but not be limited to, acts or neglect by Owner, acts or neglect of utility owners or other contractors performing other work as contemplated by Article 7, fires, floods, epidemics, abnormal weather conditions, or acts of God.

B. If Owner, Engineer, or other contractors or utility owners performing other work for Owner as contemplated by Article 7, or anyone for whom Owner is responsible, delays, disrupts, or interferes with the performance or progress of the Work, then Contractor shall be entitled to an equitable adjustment in the Contract Price or the Contract Times , or both. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times.

C If Contractor is delayed in the performance or progress of the Work by fire, flood, epidemic, abnormal weather conditions, acts of God, acts or failures to act of utility owners not under the control of Owner, or other causes not the fault of and beyond control of Owner and Contractor, then Contractor shall be entitled to an equitable (adjustment) in Contract Times, if such adjustment is essential to Contractor's ability to complete the Work within the Contract Times. Such an adjustment shall be Contractor's sole and exclusive remedy for the delays described in this Paragraph 12.03.C.

D. Owner, Engineer and the Related Entities of each of them shall not be liable to Contractor for any claims, costs, losses, or damages (including but not limited to all fees and charges of Engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by Contractor on or in connection with any other project or anticipated project.

E. Contractor shall not be entitled to an adjustment in Contract Price or Contract Times for delays within the control of Contractor. Delays attributable to and within the control of a Subcontractor or Supplier shall be deemed to be delays within the control of Contractor.

ARTICLE 13 - TESTS AND INSPECTIONS; CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK

#### 13.01 Notice of Defects

A. Prompt notice of all defective Work of which Owner or Engineer has actual knowledge will be given to Contractor. All defective Work may be rejected, corrected, or accepted as provided in this Article 13.

#### 13.02 Access to Work

A. Owner, Engineer, their consultants and other representatives and personnel of Owner, independent testing laboratories, and governmental agencies with jurisdictional interests will have access to the Site and the Work at reasonable times for their observation, inspecting, and testing. Contractor shall provide them proper and safe conditions for such access and advise them of Contractor's Site safety procedures and programs so that they may comply therewith as applicable.

#### 13.03 *Tests and Inspections*

A. Contractor shall give Engineer timely notice of readiness of the Work for all required inspections, tests, or approvals and shall cooperate with inspection and testing personnel to facilitate required inspections or tests.

B. Owner shall employ and pay for the services of an independent testing laboratory to perform all inspections, tests, or approvals required by the Contract Documents except:

1. for inspections, tests, or approvals covered by Paragraphs 13.03.C and 13.03.D below;

2. that costs incurred in connection with tests or inspections conducted pursuant to Paragraph 13.04.B shall be paid as provided in said Paragraph 13.04.C; and

3. as otherwise specifically provided in the Contract Documents.

C. If Laws or Regulations of any public body having jurisdiction require any Work (or part thereof) specifically to be inspected, tested, or approved by an employee or other representative of such public body, Contractor shall assume full responsibility for arranging and obtaining such inspections, tests, or approvals, pay all costs in connection therewith, and furnish Engineer the required certificates of inspection or approval.

D. Contractor shall be responsible for arranging and obtaining and shall pay all costs in connection with any inspections, tests, or approvals required for Owner's and Engineer's acceptance of materials or equipment to be incorporated in the Work; or acceptance of materials, mix designs, or equipment submitted for approval prior to Contractor's purchase thereof for incorporation in the Work. Such inspections, tests, or approvals shall be performed by organizations acceptable to Owner and Engineer.

E. If any Work (or the work of others) that is to be inspected, tested, or approved is covered by Contractor without written concurrence of Engineer, it must, if requested by Engineer, be uncovered for observation.

F. Uncovering Work as provided in Paragraph 13.03.E shall be at Contractor's expense unless Contractor has given Engineer timely notice of Contractor's intention to cover the same and Engineer has not acted with reasonable promptness in response to such notice.

#### 13.04 Uncovering Work

A. If any Work is covered contrary to the written request of Engineer, it must, if requested by Engineer, be uncovered for Engineer's observation and replaced at Contractor's expense.

B. If Engineer considers it necessary or advisable that covered Work be observed by Engineer or inspected or tested by others, Contractor, at Engineer's request, shall uncover, expose, or otherwise make available for observation, inspection, or testing as Engineer may require, that portion of the Work in question, furnishing all necessary labor, material, and equipment.

C. If it is found that the uncovered Work is defective, Contractor shall pay all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such uncovering, exposure, observation, inspection, and testing, and of satisfactory replacement or reconstruction (including but not limited to all costs of repair or replacement of work of others); and Owner shall be entitled to an appropriate decrease in the Contract Price. If the parties are unable to agree as to the amount thereof, Owner may make a Claim therefor as provided in Paragraph 10.05.

D. If, the uncovered Work is not found to be defective, Contractor shall be allowed an increase in the Contract Price or an extension of the Contract Times, or both, directly attributable to such uncovering, exposure, observation, inspection, testing, replacement, and reconstruction. If the parties are unable to agree as to the amount or extent thereof, Contractor may make a Claim therefor as provided in Paragraph 10.05.

13.05 Owner May Stop the Work

A. If the Work is defective, or Contractor fails to supply sufficient skilled workers or suitable materials or equipment, or fails to perform the Work in such a way that the completed Work will conform to the Contract Documents, Owner may order Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, this right of Owner to stop the Work shall not give rise to any duty on the part of Owner to exercise this right for the benefit of Contractor, any Subcontractor, any Supplier, any other individual or entity, or any surety for, or employee or agent of any of them.

#### 13.06 Correction or Removal of Defective Work

A. Promptly after receipt of notice, Contractor shall correct all defective Work, whether or not fabricated, installed, or completed, or, if the Work has been rejected by Engineer, remove it from the Project and replace it with Work that is not defective. Contractor shall pay all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or removal (including but not limited to all costs of repair or replacement of work of others).

B. When correcting defective Work under the terms of this Paragraph 13.06 or Paragraph 13.07, Contractor shall take no action that would void or otherwise impair Owner's special warranty and guarantee, if any, on said Work.

#### 13.07 Correction Period

A. If within one year after the date of Substantial Completion (or such longer period of time as may be prescribed by the terms of any applicable special guarantee required by the Contract Documents) or by any specific provision of the Contract Documents, any Work is found to be defective, or if the repair of any damages to the land or areas made available for Contractor's use by Owner or permitted by Laws and Regulations as contemplated in Paragraph 6.11.A is found to be defective, Contractor shall promptly, without cost to Owner and in accordance with Owner's written instructions:

- 1. repair such defective land or areas; or
- 2. correct such defective Work; or

3. if the defective Work has been rejected by Owner, remove it from the Project and replace it with Work that is not defective, and

4. satisfactorily correct or repair or remove and replace any damage to other Work, to the work of others or other land or areas resulting therefrom.

B. If Contractor does not promptly comply with the terms of Owner's written instructions, or in an emergency where delay would cause serious risk of loss or damage, Owner may have the defective Work corrected or repaired or may have the rejected Work removed and replaced. All claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or repair or such removal and replacement (including but not limited to all costs of repair or replacement of work of others) will be paid by Contractor.

C. In special circumstances where a particular item of equipment is placed in continuous service before Substantial Completion of all the Work, the correction period for that item may start to run from an earlier date if so provided in the Specifications.

D. Where defective Work (and damage to other Work resulting therefrom) has been corrected or removed and replaced under this Paragraph 13.07, the correction period hereunder with respect to such Work will be extended for an additional period of one year after such correction or removal and replacement has been satisfactorily completed.

E. Contractor's obligations under this Paragraph 13.07 are in addition to any other obligation or warranty. The provisions of this Paragraph 13.07 shall not be construed as a substitute for or a waiver of the provisions of any applicable statute of limitation or repose.

#### 13.08 Acceptance of Defective Work

A. If, instead of requiring correction or removal and replacement of defective Work, Owner (and, prior to Engineer's recommendation of final payment, Engineer) prefers to accept it, Owner may do so. Contractor shall pay all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) attributable to Owner's evaluation of and determination to accept such defective Work (such costs to be approved by Engineer as to reasonableness) and the diminished value of the Work to the extent not otherwise paid by Contractor pursuant to this sentence. If any such acceptance occurs prior to Engineer's recommendation of final payment, a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work, and Owner shall be entitled to an appropriate decrease in the Contract Price, reflecting the diminished value of Work so accepted. If the parties are unable to agree as to the amount thereof, Owner may make a Claim therefor as provided in Paragraph 10.05. If the acceptance occurs after such recommendation, an appropriate amount will be paid by Contractor to Owner.

#### 13.09 *Owner May Correct Defective Work*

A. If Contractor fails within a reasonable time after written notice from Engineer to correct defective Work or to remove and replace rejected Work as required by Engineer in accordance with Paragraph 13.06.A, or if Contractor fails to perform the Work in accordance with the Contract Documents, or if Contractor fails to comply with any other provision of the Contract Documents, Owner may, after seven days written notice to Contractor, correct or remedy any such deficiency.

B. In exercising the rights and remedies under this Paragraph 13.09, Owner shall proceed expeditiously. In connection with such corrective or remedial action, Owner may exclude Contractor from all or part of the Site, take possession of all or part of the Work and suspend Contractor's services related thereto, take possession of Contractor's tools, appliances, construction equipment and machinery at the Site, and incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere. Contractor shall allow Owner, Owner's representatives, agents and employees, Owner's other contractors, and Engineer and Engineer's consultants access to the Site to enable Owner to exercise the rights and remedies under this Paragraph.

C. All claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) incurred or sustained by Owner in exercising the rights and remedies under this Paragraph 13.09 will be charged against Contractor, and a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work; and Owner shall be entitled to an appropriate decrease in the Contract Price. If the parties are unable to agree as to the amount of the adjustment, Owner may make a Claim therefor as provided in Paragraph 10.05. Such claims, costs, losses and damages will include but not be limited to all costs of repair, or replacement of work of others destroyed or damaged by correction, removal, or replacement of Contractor's defective Work.

D. Contractor shall not be allowed an extension of the Contract Times because of any delay in the performance of the Work attributable to the exercise by Owner of Owner's rights and remedies under this Paragraph 13.09.

## ARTICLE 14 - PAYMENTS TO CONTRACTOR AND COMPLETION

#### 14.01 Schedule of Values

A. The Schedule of Values established as provided in Paragraph 2.07.A will serve as the basis for progress

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payments and will be incorporated into a form of Application for Payment acceptable to Engineer. Progress payments on account of Unit Price Work will be based on the number of units completed.

#### 14.02 Progress Payments

#### A. Applications for Payments

1. At least 20 days before the date established in the Agreement for each progress payment (but not more often than once a month), Contractor shall submit to Engineer for review an Application for Payment filled out and signed by Contractor covering the Work completed as of the date of the Application and accompanied by such supporting documentation as is required by the Contract Documents. If payment is requested on the basis of materials and equipment not incorporated in the Work but delivered and suitably stored at the Site or at another location agreed to in writing, the Application for Payment shall also be accompanied by a bill of sale, invoice, or other documentation warranting that Owner has received the materials and equipment free and clear of all Liens and evidence that the materials and equipment are covered by appropriate property insurance or other arrangements to protect Owner's interest therein, all of which must be satisfactory to Owner.

2. Beginning with the second Application for Payment, each Application shall include an affidavit of Contractor stating that all previous progress payments received on account of the Work have been applied on account to discharge Contractor's legitimate obligations associated with prior Applications for Payment.

3. The amount of retainage with respect to progress payments will be as stipulated in the Agreement.

#### B. Review of Applications

1. Engineer will, within 10 days after receipt of each Application for Payment, either indicate in writing a recommendation of payment and present the Application to Owner or return the Application to Contractor indicating in writing Engineer's reasons for refusing to recommend payment. In the latter case, Contractor may make the necessary corrections and resubmit the Application.

2. Engineer's recommendation of any payment requested in an Application for Payment will constitute a representation by Engineer to Owner, based on Engineer's observations on the Site of the executed Work as an experienced and qualified design professional and on Engineer's review of the Application for Payment and the accompanying data and schedules, that to the best of Engineer's knowledge, information and belief:

a. the Work has progressed to the point indicated;

b. the quality of the Work is generally in accordance with the Contract Documents (subject to an evaluation of the Work as a functioning whole prior to or upon Substantial Completion, to the results of any subsequent tests called for in the Contract Documents, to a final determination of quantities and classifications for Unit Price Work under Paragraph 9.07, and to any other qualifications stated in the recommendation); and

e. the conditions precedent to Contractor's being entitled to such payment appear to have been fulfilled in so far as it is Engineer's responsibility to observe the Work.

3. By recommending any such payment Engineer will not thereby be deemed to have represented that:

a. inspections made to check the quality or the quantity of the Work as it has been performed have been exhaustive, extended to every aspect of the Work in progress, or involved detailed inspections of the Work beyond the responsibilities specifically assigned to Engineer in the Contract Documents; or

b. that there may not be other matters or issues between the parties that might entitle Contractor to be paid additionally by Owner or entitle Owner to withhold payment to Contractor.

4. Neither Engineer's review of Contractor's Work for the purposes of recommending payments nor Engineer's recommendation of any payment, including final payment, will impose responsibility on Engineer:

a. to supervise, direct, or control the Work, or

b. for the means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or

e. for Contractor's failure to comply with Laws and Regulations applicable to Contractor's performance of the Work, or

d. to make any examination to ascertain how or for what purposes Contractor has used the moneys paid on account of the Contract Price, or

e. to determine that title to any of the Work, materials, or equipment has passed to Owner free and clear of any Liens.

5. Engineer may refuse to recommend the whole or any part of any payment if, in Engineer's opinion, it would be incorrect to make the representations to Owner stated in Paragraph 14.02.B.2. Engineer may also refuse to recommend any such payment or, because of subsequently discovered evidence or the results of subsequent inspections or tests, revise or revoke any such payment recommendation previously made, to such extent as may be necessary in Engineer's opinion to protect Owner from loss because:

> a. the Work is defective, or completed Work has been damaged, requiring correction or replacement;

> b. the Contract Price has been reduced by Change Orders;

e. Owner has been required to correct defective Work or complete Work in accordance with Paragraph 13.09; or

d. Engineer has actual knowledge of the occurrence of any of the events enumerated in Paragraph 15.02.A.

#### C. Payment Becomes Due

1. Ten days after presentation of the Application for Payment to Owner with Engineer's recommendation, the amount recommended will (subject to the provisions of Paragraph 14.02.D) become due, and when due will be paid by Owner to Contractor.

#### D. Reduction in Payment

1. Owner may refuse to make payment of the full amount recommended by Engineer because:

a. claims have been made against Owner on account of Contractor's performance or furnishing of the Work;

b. Liens have been filed in connection with the Work, except where Contractor has delivered a specific bond satisfactory to Owner to secure the satisfaction and discharge of such Liens;

e. there are other items entitling Owner to a set-off against the amount recommended; or

d. Owner has actual knowledge of the occurrence of any of the events enumerated in Paragraphs 14.02.B.5.a through 14.02.B.5.e or Paragraph 15.02.A.

2. If Owner refuses to make payment of the full amount recommended by Engineer, Owner will give Contractor immediate written notice (with a copy to Engineer) stating the reasons for such action and promptly pay Contractor any amount remaining after deduction of the amount so withheld. Owner shall promptly pay Contractor the amount so withheld, or any adjustment thereto agreed to by Owner and Contractor, when Contractor corrects to Owner's satisfaction the reasons for such action. 3. If it is subsequently determined that Owner's refusal of payment was not justified, the amount wrongfully withheld shall be treated as an amount due as determined by Paragraph 14.02.C.1.

#### 14.03 Contractor's Warranty of Title

A. Contractor warrants and guarantees that title to all Work, materials, and equipment covered by any Application for Payment, whether incorporated in the Project or not, will pass to Owner no later than the time of payment free and clear of all Liens.

14.04 Substantial Completion

A. When Contractor considers the entire Work ready for its intended use Contractor shall notify Owner and Engineer in writing that the entire Work is substantially complete (except for items specifically listed by Contractor as incomplete) and request that Engineer issue a certificate of Substantial Completion.

B. Promptly after Contractor's notification, , Owner, Contractor, and Engineer shall make an inspection of the Work to determine the status of completion. If Engineer does not consider the Work substantially complete, Engineer will notify Contractor in writing giving the reasons therefor.

C. If Engineer considers the Work substantially complete, Engineer will deliver to Owner a tentative certificate of Substantial Completion which shall fix the date of Substantial Completion. There shall be attached to the certificate a tentative list of items to be completed or eorrected before final payment. Owner shall have seven days after receipt of the tentative certificate during which to make written objection to Engineer as to any provisions of the certificate or attached list. If, after considering such objections, Engineer concludes that the Work is not substantially complete, Engineer will within 14 days after submission of the tentative certificate to Owner notify Contractor in writing, stating the reasons therefor. If, after consideration of Owner's objections, Engineer considers the Work substantially complete, Engineer will within said 14 days execute and deliver to Owner and Contractor a definitive certificate of Substantial Completion (with a revised tentative list of items to be completed or corrected) reflecting such changes from the tentative certificate as Engineer believes justified after consideration of any objections from Owner.

D. At the time of delivery of the tentative eertificate of Substantial Completion, Engineer will deliver to Owner and Contractor a written recommendation as to division of responsibilities pending final payment between Owner and Contractor with respect to security, operation, safety, and protection of the Work, maintenance, heat, utilities, insurance, and warranties and guarantees. Unless Owner and Contractor agree otherwise in writing and so inform Engineer in writing prior to Engineer's issuing the definitive certificate of Substantial

### Completion, Engineer's aforesaid recommendation will be binding on Owner and Contractor until final payment.

E. Owner shall have the right to exclude Contractor from the Site after the date of Substantial Completion subject to allowing Contractor reasonable access to complete or correct items on the tentative list.

#### 14.05 Partial Utilization

A. Prior to Substantial Completion of all the Work, Owner may use or occupy any substantially completed part of the Work which has specifically been identified in the Contract Documents, or which Owner, Engineer, and Contractor agree constitutes a separately functioning and usable part of the Work that can be used by Owner for its intended purpose without significant interference with Contractor's performance of the remainder of the Work, subject to the following conditions.

1. Owner at any time may request Contractor in writing to permit Owner to use or occupy any such part of the Work which Owner believes to be ready for its intended use and substantially complete. If and when Contractor agrees that such part of the Work is substantially complete, Contractor will certify to Owner and Engineer that such part of the Work is substantially complete and request Engineer to issue a certificate of Substantial Completion for that part of the Work.

2. Contractor at any time may notify Owner and Engineer in writing that Contractor considers any such part of the Work ready for its intended use and substantially complete and request Engineer to issue a certificate of Substantial Completion for that part of the Work.

3. Within a reasonable time after either such request, Owner, Contractor, and Engineer shall make an inspection of that part of the Work to determine its status of completion. If Engineer does not consider that part of the Work to be substantially complete, Engineer will notify Owner and Contractor in writing giving the reasons therefor. If Engineer considers that part of the Work to be substantially complete, the provisions of Paragraph 14.04 will apply with respect to certification of Substantial Completion of that part of the Work and the division of responsibility in respect thereof and access thereto.

4. No use or occupancy or separate operation of part of the Work may occur prior to compliance with the requirements of Paragraph 5.10 regarding property insurance.

#### 14.06 Final Inspection

A. Upon written notice from Contractor that the entire Work or an agreed portion thereof is complete, Engineer will promptly make a final inspection with Owner and Contractor and will notify Contractor in writing of all particulars in which this inspection reveals that the Work is incomplete or defective. Contractor shall immediately take such measures as are necessary to complete such Work or remedy such deficiencies.

#### 14.07 Final Payment

#### A. Application for Payment

1. After Contractor has, in the opinion of Engineer, satisfactorily completed all corrections identified during the final inspection and has delivered, in accordance with the Contract Documents, all maintenance and operating instructions, schedules, guarantees, bonds, certificates or other evidence of insurance certificates of inspection, marked-up record documents (as provided in Paragraph 6.12), and other documents, Contractor may make application for final payment following the procedure for progress payments.

2. The final Application for Payment shall be accompanied (except as previously delivered) by:

a. all documentation called for in the Contract Documents, including but not limited to the evidence of insurance required by Paragraph 5.04.B.7;

b. consent of the surety, if any, to final payment;

e. a list of all Claims against Owner that Contractor believes are unsettled; and

d. complete and legally effective releases or waivers (satisfactory to Owner) of all Lien rights arising out of or Liens filed in connection with the Work.

3. In lieu of the releases or waivers of Liens specified in Paragraph 14.07.A.2 and as approved by Owner, Contractor may furnish receipts or releases in full and an affidavit of Contractor that: (i) the releases and receipts include all labor, services, material, and equipment for which a Lien could be filed; and (ii) all payrolls, material and equipment bills, and other indebtedness connected with the Work for which Owner or Owner's property might in any way be responsible have been paid or otherwise satisfied. If any Subcontractor or Supplier fails to furnish such a release or receipt in full, Contractor may furnish a bond or other collateral satisfactory to Owner to indemnify Owner against any Lien.

B. Engineer's Review of Application and Acceptance

1. If, on the basis of Engineer's observation of the Work during construction and final inspection, and Engineer's review of the final Application for Payment and accompanying documentation as required by the Contract Documents, Engineer is satisfied that the Work has been completed and Contractor's other obligations

EJCDC C-700 Standard General Conditions of the Construction Contract. Copyright © 2002 National Society of Professional Engineers for EJCDC. All rights reserved. 00700 - 37 under the Contract Documents have been fulfilled, Engineer will, within ten days after receipt of the final Application for Payment, indicate in writing Engineer's recommendation of payment and present the Application for Payment to Owner for payment. At the same time Engineer will also give written notice to Owner and Contractor that the Work is acceptable subject to the provisions of Paragraph 14.09. Otherwise, Engineer will return the Application for Payment to Contractor, indicating in writing the reasons for refusing to recommend final payment, in which case Contractor shall make the necessary corrections and resubmit the Application for Payment.

#### C. Payment Becomes Due

1. Thirty days after the presentation to Owner of the Application for Payment and accompanying documentation, the amount recommended by Engineer, less any sum Owner is entitled to set off against Engineer's recommendation, including but not limited to liquidated damages, will become due and , will be paid by Owner to Contractor.

#### 14.08 Final Completion Delayed

A. If, through no fault of Contractor, final completion of the Work is significantly delayed, and if Engineer so confirms, Owner shall, upon receipt of Contractor's final Application for Payment (for Work fully completed and accepted) and recommendation of Engineer, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed and accepted. If the remaining balance to be held by Owner for Work not fully completed or eorrected is less than the retainage stipulated in the Agreement, and if bonds have been furnished as required in Paragraph 5.01, the written consent of the surety to the payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by Contractor to Engineer with the Application for such payment. Such payment shall be made under the terms and conditions governing final payment, except that it shall not constitute a waiver of Claims.

#### 14.09 Waiver of Claims

A. The making and acceptance of final payment will constitute:

1. a waiver of all Claims by Owner against Contractor, except Claims arising from unsettled Liens, from defective Work appearing after final inspection pursuant to Paragraph 14.06, from failure to comply with the Contract Documents or the terms of any special guarantees specified therein, or from Contractor's continuing obligations under the Contract Documents; and

2. a waiver of all Claims by Contractor against Owner other than those previously made in accordance with the requirements herein and expressly acknowledged by Owner in writing as still unsettled.

## ARTICLE 15 - SUSPENSION OF WORK AND TERMINATION

#### 15.01 Owner May Suspend Work

A. At any time and without cause, Owner may suspend the Work or any portion thereof for a period of not more than 90 consecutive days by notice in writing to Contractor and Engineer which will fix the date on which Work will be resumed. Contractor shall resume the Work on the date so fixed. Contractor shall be granted an adjustment in the Contract Price or an extension of the Contract Times, or both, directly attributable to any such suspension if Contractor makes a Claim therefor as provided in Paragraph 10.05.

#### 15.02 Owner May Terminate for Cause

A. The occurrence of any one or more of the following events will justify termination for cause:

1. Contractor's persistent failure to perform the Work in accordance with the Contract Documents (including, but not limited to, failure to supply sufficient skilled workers or suitable materials or equipment or failure to adhere to the Progress Schedule established under Paragraph 2.07 as adjusted from time to time pursuant to Paragraph 6.04);

2. Contractor's disregard of Laws or Regulations of any public body having jurisdiction;

3. Contractor's disregard of the authority of Engineer; or

4. Contractor's violation in any substantial way of any provisions of the Contract Documents.

B. If one or more of the events identified in Paragraph 15.02.A occur, Owner may, after giving Contractor (and surety) seven days written notice of its intent to terminate the services of Contractor:

1. exclude Contractor from the Site, and take possession of the Work and of all Contractor's tools, appliances, construction equipment, and machinery at the Site, and use the same to the full extent they could be used by Contractor (without liability to Contractor for trespass or conversion),

2. incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere, and 3. complete the Work as Owner may deem expedient.

C. If Owner proceeds as provided in Paragraph 15.02.B. Contractor shall not be entitled to receive any further payment until the Work is completed. If the unpaid balance of the Contract Price exceeds all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by Owner arising out of or relating to completing the Work, such excess will be paid to Contractor. If such claims, costs, losses, and damages exceed such unpaid balance, Contractor shall pay the difference to Owner. Such claims, costs, losses, and damages incurred by Owner will be reviewed by Engineer as to their reasonableness and, when so approved by Engineer, incorporated in a Change Order. When exercising any rights or remedies under this Paragraph Owner shall not be required to obtain the lowest price for the Work performed.

D. Notwithstanding Paragraphs 15.02.B and 15.02.C, Contractor's services will not be terminated if Contractor begins within seven days of receipt of notice of intent to terminate to correct its failure to perform and proceeds diligently to cure such failure within no more than 30 days of receipt of said notice.

E. Where Contractor's services have been so terminated by Owner, the termination will not affect any rights or remedies of Owner against Contractor then existing or which may thereafter accrue. Any retention or payment of moneys due Contractor by Owner will not release Contractor from liability.

F. If and to the extent that Contractor has provided a performance bond under the provisions of Paragraph 5.01.A, the termination procedures of that bond shall supersede the provisions of Paragraphs 15.02.B, and 15.02.C.

#### 15.03 Owner May Terminate For Convenience

A. Upon seven days written notice to Contractor and Engineer, Owner may, without cause and without prejudice to any other right or remedy of Owner, terminate the Contract. In such case, Contractor shall be paid for (without duplication of any items):

1. completed and acceptable Work executed in accordance with the Contract Documents prior to the effective date of termination, including fair and reasonable sums for overhead and profit on such Work; 2. expenses sustained prior to the effective date of termination in performing services and furnishing labor, materials, or equipment as required by the Contract Documents in connection with uncompleted Work, plus fair and reasonable sums for overhead and profit on such expenses;

3. all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) incurred in settlement of terminated contracts with Subcontractors, Suppliers, and others; and

4. reasonable expenses directly attributable to termination.

#### B. Contractor shall not be paid on account of loss of anticipated profits or revenue or other economic loss arising out of or resulting from such termination.

#### 15.04 Contractor May Stop Work or Terminate

A. If, through no act or fault of Contractor, (i) the Work is suspended for more than 90 consecutive days by Owner or under an order of court or other public authority, or (ii) Engineer fails to act on any Application for Payment within 30 days after it is submitted, or (iii) Owner fails for 30 days to pay Contractor any sum finally determined to be due, then Contractor may, upon seven days written notice to Owner and Engineer, and provided Owner or Engineer do not remedy such suspension or failure within that time, terminate the Contract and recover from Owner payment on the same terms as provided in Paragraph 15.03.

B. In lieu of terminating the Contract and without prejudice to any other right or remedy, if Engineer has failed to act on an Application for Payment within 30 days after it is submitted, or Owner has failed for 30 days to pay Contractor any sum finally determined to be due, Contractor may, seven days after written notice to Owner and Engineer, stop the Work until payment is made of all such amounts due Contractor, including interest thereon. The provisions of this Paragraph 15.04 are not intended to preclude Contractor from making a Claim under Paragraph 10.05 for an adjustment in Contract Price or Contract Times or otherwise for expenses or damage directly attributable to Contractor's stopping the Work as permitted by this Paragraph.

#### **ARTICLE 16 - DISPUTE RESOLUTION**

#### 16.01 *Methods and Procedures*

A. Either Owner or Contractor may request mediation of any Claim submitted to Engineer for a decision under Paragraph 10.05 before such decision becomes final and binding. The mediation will be

EJCDC C-700 Standard General Conditions of the Construction Contract. Copyright © 2002 National Society of Professional Engineers for EJCDC. All rights reserved. 00700 - 39 governed by the Construction Industry Mediation Rules of the American Arbitration Association in effect as of the Effective Date of the Agreement. The request for mediation shall be submitted in writing to the American Arbitration Association and the other party to the Contract. Timely submission of the request shall stay the effect of Paragraph 10.05.E.

B. Owner and Contractor shall participate in the mediation process in good faith. The process shall be concluded within 60 days of filing of the request. The date of termination of the mediation shall be determined by application of the mediation rules referenced above.

C. If the Claim is not resolved by mediation, Engineer's action under Paragraph 10.05.C or a denial pursuant to Paragraphs 10.05.C.3 or 10.05.D shall become final and binding 30 days after termination of the mediation unless, within that time period, Owner or Contractor:

1. elects in writing to invoke any dispute resolution process provided for in the Supplementary Conditions, or

2. agrees with the other party to submit the Claim to another dispute resolution process, or

3. gives written notice to the other party of their intent to submit the Claim to a court of competent jurisdiction.

#### ARTICLE 17 - MISCELLANEOUS

#### 17.01 *Giving Notice*

A. Whenever any provision of the Contract Documents requires the giving of written notice, it will be deemed to have been validly given if:

1. delivered in person to the individual or to a member of the firm or to an officer of the corporation for whom it is intended, or

2. delivered at or sent by registered or certified mail, postage prepaid, to the last business address known to the giver of the notice.

#### 17.02 *Computation of Times*

A. When any period of time is referred to in the Contract Documents by days, it will be computed to exclude the first and include the last day of such period. If the last day of any such period falls on a Saturday or Sunday or on a day made a legal holiday by the law of the applicable jurisdiction, such day will be omitted from the computation.

#### 17.03 *Cumulative Remedies*

A. The duties and obligations imposed by these General Conditions and the rights and remedies available hereunder to the parties hereto are in addition to, and are not to be construed in any way as a limitation of, any rights and remedies available to any or all of them which are otherwise imposed or available by Laws or Regulations, by special warranty or guarantee, or by other provisions of the Contract Documents. The provisions of this Paragraph will be as effective as if repeated specifically in the Contract Documents in connection with each particular duty, obligation, right, and remedy to which they apply.

#### 17.04 *Survival of Obligations*

A. All representations, indemnifications, warranties, and guarantees made in, required by, or given in accordance with the Contract Documents, as well as all continuing obligations indicated in the Contract Documents, will survive final payment, completion, and acceptance of the Work or termination or completion of the Contract or termination of the services of Contractor.

#### 17.05 Controlling Law

A. This Contract is to be governed by the law of the state in which the Project is located.

17.06 Headings

A. Article and paragraph headings are inserted for convenience only and do not constitute parts of these General Conditions.

#### **BID BOND**

KNOW ALL MEN BY THESE PRESENTS, that we, the undersigned,

(Name of Contractor)	_
(Address of Contractor)	-
a, hereinafter called PRINCIPAL and (Corporation, Partnership, or Ind	ividual)
(Name of Surety)	-
(Address of Surety)	-
hereinafter called Surety, are held and firmly bound unto	
the Town of Natick, Massachusetts	_
(Name of Owner)	_
Natick Town Hall, 13 East Central Street, Natick, MA 01760	
(Address of Owner)	
as OWNER in the total aggregate penal sum of	
Dollars (\$	)

in lawful money of the United States, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, successors, and assigns, jointly and severally, firmly by these presents.

The Condition of the above obligation is such that, whereas the Principal has submitted to the Board of Selectmen, Town of Natick, Massachusetts a certain Bid, attached hereto and hereby made a part hereof and hereby incorporated by reference herein, to enter into a Contract in writing, for Parks Construction for the East Park in the Town of Natick.

NOW, THEREFORE,

- (a) If said Bid shall be rejected, or
- (b) If said Bid shall be accepted and the Principal shall execute and deliver a Contract in the Form of Contract attached hereto (properly completed in accordance with said Bid) and shall furnish a Bond for his faithful performance of said Contract, and for the payment of all persons performing labor or furnishing materials in connection therewith, and shall in all other respects perform the agreement created by the acceptance of said Bid,

then this obligation shall be void, otherwise the same shall remain in force and effect; it being expressly understood and agreed that the liability of the Surety for any and all claims hereunder shall, in no event, exceed the penal amount of this obligation as herein stated.

The Surety, for value received, hereby stipulates and agrees that the obligations of said Surety and its Bond shall be in no way impaired or affected by any extension of the time within which the OWNER may accept such Bid; and said Surety does hereby waive notice of any such extension.

IN WITNESS WHEREOF, the Principal and the Surety have hereunto set their hand and seals, and such of them as are corporations have caused their corporate seals to be hereto affixed and these presents to be signed by their proper officers, the day and year first set forth above.

ATTEST:

	Principal
(Principal Secretary)	_
(SEAL)(s)	By
	Signature
Printed Name	
	Printed Title
(Address)	(Address)
	(Surety)
ATTEST:	
	By
(Witness as to Surety)	ByAttorney-in-Fact Signature
	Printed Name

Printed Title

(Address)

(Address)

If Contractor is partnership, all partners should execute Bond.

IMPORTANT - Surety companies executing Bonds must appear on the Treasury Department's most current list (Circular 570 as amended) and be authorized to transact business in the state of Massachusetts.

#### NOTICE OF AWARD

DATED
-------

To:	BIDDER:	
	ADDRESS:	

OWNER has considered the Bid submitted by you for the above described Work in response to the Invitation for Bids dated \_\_\_\_\_\_ and Instructions to Bidders.

You are hereby notified that your Bid has been accepted in the amount of \$ .

You shall comply with the following conditions precedent within ten (10) calendar days of the date of this Notice of Award, that is by \_\_\_\_\_.

- 1. You shall deliver to OWNER five (5) fully executed counterparts of the Agreement including all the Contract Documents. Each of the Contract Documents shall bear your signature on the cover page.
- 2. You shall deliver with the executed Agreement, the Contract Security (Bonds including both a fully-executed Performance Bond and a fully-executed Payment Bond - and Certificates of Insurance) as specified in the Instructions to Bidders, General Conditions and Supplementary Conditions.

Failure to comply with these conditions within the time specified will entitle OWNER to consider your bid abandoned, to annul this Notice of Award and to declare your Bid Security forfeited.

Five (5) copies of each of the proposed Contract Documents accompany this Notice of Award.

Within ten (10) days after you comply with those conditions, OWNER will return to you one (1) fully signed counterpart of the Agreement with the Contract Documents attached.

Dated this	day	of	, 20	

By:

Signature of Owner's Representative

Printed Name

Printed Title

ACCEPTANCE OF NOTICE

Receipt of the above NOTICE OF AWARD is hereby acknowledged

\_\_\_\_\_

 By
 (Contractor)

 this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_.

 By

 Authorized Signature

Printed Name

Printed Title

COPY TO ENGINEER

### AGREEMENT

THIS AGREEMENT made this \_\_\_\_\_\_ day of \_\_\_\_\_\_ in the year 2018, by and between the Town of Natick, Massachusetts, Natick Town Hall, 13 East Central Street, Natick, MA 01760 (hereinafter called OWNER), by its Board of Selectmen, and

\_\_\_\_\_, having an address of \_\_\_\_\_\_, and doing business as a (Corporation, Partnership or Individual) hereinafter called "CONTRACTOR."

WITNESSETH: That for and in consideration of the payments and agreements hereinafter mentioned, OWNER and CONTRACTOR hereby agree as follows:

#### ARTICLE 1. WORK

1.1. CONTRACTOR shall commence the Work as specified or indicated in the AGREEMENT Documents as defined in Article 8 herein. The Work is generally described as follows:

1.2. The Work for this project consists of parks construction for the East Park in Natick.

1.3. CONTRACTOR shall furnish all materials, supplies, tools, equipment, labor, and other services necessary for the construction and completion of the Project described herein.

#### ARTICLE 2. ENGINEER

2.1. The Project has been designed by Weston & Sampson, Inc., which is hereinafter called ENGINEER and who shall act as OWNER'S representative, who shall assume all duties and responsibilities, and who and shall have the rights and authority assigned to ENGINEER in the AGREEMENT Documents in connection with completion of the Work in accordance with the AGREEMENT Documents.

#### ARTICLE 3. AGREEMENT TIME

3.1. CONTRACTOR shall commence work when authorization by the OWNER or ENGINEER with the provisions of the Notice to Proceed and AGREEMENT Documents. The work will be substantially complete by July 15, 2019.

#### ARTICLE 4. AGREEMENT PRICE

4.1. In consideration for performance of the work as required by the AGREEMENT Documents, the OWNER shall pay CONTRACTOR for completion of the Work in accordance with the AGREEMENT Documents in current funds as follows:

Contractor's Bid is attached to this AGREEMENT as an exhibit.

#### AGREEMENT PRICES

ITEM UNIT <u>NO.</u> <u>DESCRIPTION</u> <u>QUANTITY</u> <u>PRICE</u>

**AMOUNT** 

### TOTAL AGREEMENT AMOUNT <u>\$</u>\_\_\_\_\_

As permitted by law, specific items of this AGREEMENT may be eliminated, or reduced in quantity to keep within the limits of available funding, at the OWNER'S option.

#### ARTICLE 5. PAYMENT PROCEDURES

5.1. CONTRACTOR shall submit Applications for Payment in accordance with Article 14 of the General Conditions, as modified, if applicable, by the Supplementary Conditions. Applications for Payment will be processed by ENGINEER as provided in the General Conditions.

5.2. Progress Payments. OWNER shall make progress payments on account of the AGREEMENT Price on the basis of CONTRACTOR'S Applications for Payment as recommended by ENGINEER and as provided in Article 14 of the General Conditions, as modified, if applicable, by the Supplementary Conditions.

5.3. Final Payment. Upon final completion and acceptance of the Work in accordance with paragraph 14.13 of the General Conditions, as modified, if applicable, by the Supplementary Conditions, OWNER shall pay the remainder of the AGREEMENT Price as recommended by ENGINEER as provided in said paragraph 14.13.

#### ARTICLE 6. TERMS

6.1. Terms used in this Agreement, which are defined in Article 1 of the General Conditions, as modified, if applicable, by the Supplementary Conditions, will have the meanings indicated in the General Conditions, as modified, if applicable, by the Supplementary Conditions.

#### ARTICLE 7. CONTRACTOR'S REPRESENTATIONS

In order to induce OWNER to enter into this AGREEMENT CONTRACTOR makes the following representations:

7.1. CONTRACTOR has familiarized itself with the nature and extent of the AGREEMENT Documents, work, site, locality, and all local conditions and Laws and Regulations that in any manner may affect cost, progress, performance or furnishing of the Work.

7.2. CONTRACTOR has studied carefully all reports of explorations and tests of subsurface conditions and drawings of physical conditions which are identified in the Supplementary Conditions as provided in paragraph 4.2 of the General Conditions, and accepts the determination set forth in paragraph SC-4.2 of the Supplementary Conditions of the extent of the technical data contained in such reports and drawings upon which CONTRACTOR is entitled to rely.

7.3. CONTRACTOR has obtained and carefully studied (or assumes responsibility for obtaining and carefully studying) all such examinations, investigations, explorations, tests, reports and studies (in addition to or to supplement those referred to in paragraph 7.2 above) which pertain to the subsurface or physical conditions at or contiguous to the site or otherwise may affect the cost, progress, performance or furnishing of the Work as CONTRACTOR considers necessary for the performance or furnishing of the Work at the AGREEMENT Price, within the AGREEMENT Time and in accordance with the other terms and conditions of the AGREEMENT Documents, including specifically the provisions of paragraph 4.2 of the General Conditions, as modified, if applicable, by the Supplementary Conditions; and no additional examinations, investigations, explorations, tests, reports, studies or similar information or data are or will be required by CONTRACTOR for such purposes.

7.4. CONTRACTOR has reviewed and checked all information and data shown or indicated on the AGREEMENT Documents with respect to existing Underground Facilities at or contiguous to the site and assumes responsibility for the accurate location of said Underground Facilities. No additional examinations, investigations, explorations, tests, reports, studies or similar information or data in respect of said Underground Facilities are or will be required by CONTRACTOR in order to perform and furnish the Work at the AGREEMENT Price, within the AGREEMENT Time and in accordance with the other terms and conditions of the AGREEMENT Documents, including specifically the provisions of paragraph 4.3 of the General Conditions, as modified, if applicable, by the Supplementary Conditions.

7.5. CONTRACTOR has correlated the results of all such observations, examinations, investigations, explorations, tests, reports and studies with the terms and conditions of the AGREEMENT Documents.

7.6. CONTRACTOR has given ENGINEER written notice of all conflicts, errors or discrepancies that he has discovered in the AGREEMENT Documents and the written resolution thereof by ENGINEER is acceptable to CONTRACTOR.

### ARTICLE 8. AGREEMENT DOCUMENTS

The AGREEMENT Documents which comprise the entire agreement between OWNER and CONTRACTOR concerning the Work consist of the following:

- 8.1 Invitation for Bids
- 8.2 Instructions to Bidders
- 8.3 Contractor's Bid
- 8.4 This AGREEMENT ("Agreement")
- 8.5. Exhibits to this AGREEMENT
- 8.6. General Conditions
- 8.7 Supplementary Conditions
- 8.8 Contractor's Performance and Payment Bonds, and insurance certificates
- 8.9. Notice of Award
- 8.10 Notice to Proceed
- 8.11 Specifications contained in Divisions \_\_\_\_\_, as listed in table of contents
- 8.12 Construction Drawings
- 8.13 Addenda numbers \_\_\_\_\_ to \_\_\_\_, inclusive.
- 8.14 Change Order

There are no AGREEMENT Documents other than those listed above in this Article 8. The AGREEMENT Documents may only be amended, modified or supplemented as provided in paragraphs 3.4 and 3.5 of the General Conditions.

### ARTICLE 9. INDEMNIFICATION

To the fullest extent permitted by law, the CONTRACTOR shall indemnify, defend, and hold harmless the Town of Natick and all of its officers, employees, boards, commissions, committees, agents and representatives from and against all claims, causes of action, suits, costs, damages, and liability of any kind which arise out of the breach by the CONTRACTOR of its obligations under this Contract, or the act or omission of the CONTRACTOR, its Subcontractors, or their officers, employees, agents and representatives or anyone directly or indirectly employed by them, or anyone for whose acts or omissions they may be liable, regarding the work to be performed by the CONTRACTOR under the Contract, or which arise out of the violation of any Federal, Massachusetts or Town of Natick statute, by-law, rule, regulation, order or directive, or which relate to personal injury or property damage suffered by the CONTRACTOR or any of its officers or employees regarding the subject matter of the Contract.

#### ARTICLE 10: INSURANCE

10.1. The CONTRACTOR shall provide insurance that satisfies the categories and amounts specified in Article 5 of the General Conditions, as modified by Article 5 of the Supplementary Conditions.

10.2. Each certificate and policy of insurance required by this AGREEMENT shall contain a cancellation provision as indicated below with no variations.

"Should any of the above described policies be canceled or materially amended before the expiration date thereof, the issuing insurer or the CONTRACTOR will mail within thirty (30) days written notice to the certificate holder named to the left".

10.3. The Town of Natick and ENGINEER shall be named as an additional insured on each policy of insurance required by this agreement other than worker's compensation.

### ARTICLE 11: MISCELLANEOUS PROVISIONS

11.1. No assignment by CONTRACTOR of any rights under or interests in the AGREEMENT Documents will be binding on OWNER without the written consent of OWNER; and specifically but without limitation moneys that may become due and moneys that are due may not be assigned without such consent, and unless specifically stated to the contrary in any written consent to an assignment no assignment will release or discharge the CONTRACTOR from any duty or responsibility under the AGREEMENT Documents.

11.2. This AGREEMENT shall be binding upon the OWNER and CONTRACTOR, their respective heirs, executors, administrators, successors, or assigns and legal representative to the other party hereto, its partners, heirs, executors, successors, assigns and legal representatives in respect of all covenants, agreements and obligations contained in the AGREEMENT Documents.

11.3. If any provision of this AGREEMENT shall be determined to be invalid or unenforceable by final judgment of a court of competent jurisdiction, the remaining provisions shall continue in effect to the extent permitted by law.

11.4. This AGREEMENT may be amended only by a written instrument signed by the parties.

11.5. This AGREEMENT shall be governed by and construed in accordance with the Massachusetts law, without respect to choice of law principles.

11.6. The CONTRACTOR shall provide to the satisfaction of the OWNER, adequate supervision of all work performed under this Agreement.

11.7. This AGREEMENT shall be subject to the Natick Non-Discrimination in the Workforce provision included in Part I Supplementary Conditions.

11.8. The CONTRACTOR shall comply with all provisions of law applicable to his work including without limitation statutes, by-laws rules, regulations, orders and directives. This AGREEMENT shall be considered to include in their entirety all terms respecting workers' compensation insurance and other terms required to be included in it by Chapter 152 of the Massachusetts General Laws, as amended, and any other laws, as though such terms were set forth in their entirety herein. The CONTRACTOR shall comply with all applicable provisions of law and regulation as specified by the Williams-Steiger Occupational Safety and Health Act of 1970, as amended.

11.9. The CONTRACTOR has made this AGREEMENT in reliance on his own examinations and estimates as to the amount and character of his work, and conditions which may be encountered in the performance thereof, and shall assume all risks and bear all losses pertaining thereto.

11.10. The CONTRACTOR shall compensate the Town of Natick for all damages to the Town property of any nature arising out of the CONTRACTOR'S work.

11.11. The Town of Natick may defer payment to the CONTRACTOR of such sums otherwise due him under this AGREEMENT for such period of time as the Director of Public Works may deem required by law or expedient for protection of the Town or others against his noncompliance with the provisions thereof; and the Town may reimburse itself, by deduction from the money so retained, for all expense and loss resulting to it from his noncompliance.

11.12. No payment by the Town of Natick to the CONTRACTOR shall be deemed to be a waiver of any right of the Town of Natick under this AGREEMENT or ratification by the Town of Natick any breach hereof by him.

11.13. The CONTRACTOR shall provide services under this AGREEMENT as an independent CONTRACTOR with the town of Natick and the CONTRACTOR and its employees shall not be entitled to receive any benefits of employment with the Town of Natick, including without limitation salary, overtime, vacation pay, holiday pay, health insurance, life insurance, pension or deferred compensation.

11.14. If any assignment shall be made by the CONTRACTOR or by any guarantor of the CONTRACTOR for the benefit of creditors, or if a petition is filed by the CONTRACTOR or by any guarantor of the CONTRACTOR for adjudication as a bankrupt, or for reorganization or an arrangement under any provision of the Bankruptcy Act as then in force and effect, or if an involuntary petition under any of the provisions of the Bankruptcy Act is filed against the CONTRACTOR and such involuntary petition is not discharged within ninety (90) days thereafter, in any event the Town may terminate this AGREEMENT upon written notice to the CONTRACTOR.

11.15. The award of this AGREEMENT and the continued operation of this Contract are subject to appropriation by Natick Town Meeting of sufficient money to fund the Contract.

11.16. OWNER may terminate this AGREEMENT upon written notice to the CONTRACTOR if a source of money to fund the AGREEMENT is lost during any year of the AGREEMENT term. In the alternative, the parties may agree in writing to amend the AGREEMENT to provide for an AGREEMENT price which represents the reduced appropriation for a contract year.

11.17. In the event of termination, the CONTRACTOR shall be entitled to be paid for services rendered in accordance with this AGREEMENT prior to termination.

IN WITNESS WHEREOF, OWNER and CONTRACTOR have executed or caused to be executed by their duly authorized officials this Agreement in five (5) copies, each of which shall be deemed as an original on the date first above written. One Counterpart each has been delivered to OWNER, CONTRACTOR, ENGINEER, Town Counsel and Town Accountant.

OWNER:	CONTRACTOR:
Town of Natick, Massachusetts	Printed Name of CONTRACTOR
The Natick Board of Selectmen	
Amy K. Mistrot, Chairman	Signature
Susan G. Salamoff, Vice Chairman	Printed Name
Michael J. Hickey, Jr., Clerk	Printed Title
Jonathan H. Freedman	
Richard P. Jennett, Jr.	
Dated:	Dated:

[ CORPORATE SEAL ]

Attest

Owner Address for giving notices:

Contractor Address for giving notices:

Board of Selectmen

Natick Town Hall

13 East Central Street Natick, MA 01760

# CERTIFICATE OF APPROPRIATION

In accordance with the requirements of M.G.L. Chapter 44, Section 31C, this is to certify that an appropriation in the amount of this Agreement is available therefore, and that the Natick Board of Selectmen is authorized to execute this Agreement and to approve all requisitions and execute change orders.

Arti P. Mehta Comptroller

APPROVED AS TO FORM ONLY (AND NOT AS TO SUBSTANCE):

Date

Date

# **CERTIFICATE OF CORPORATE AUTHORIZATION**

I,	, Clerk of	, a	corporation organized
pursuant to			corporation organized office at
	hereby certify that a	t a meeting of the Boa	rd of Directors of
	(the "Corporation") du	ily held on	,, at which t be earlier than Lease)
•		(Date mus	t be earlier than Lease)
A quorum was pres and effect:	sent and voting throughout, the	e following vote was c	luly passed and is now in full force
"VOTED: That		be and here	
authorized, directed the corporate seal, of Corporation, with t	execute, acknowledge and del he Town of Natick, acting by	ame and on behalf of t iver all contracts, bond and through the Town	his Corporation to sign seal with ds and other obligations of the of Natick, Massachusetts, 13 East lease, bond or obligation by such
	elivered to the Town of Natick		k of this Corporation setting forth
	(Name of Officer)		
is duly elected		of said C	orporation.
	(Title)		-
Signed:			
Printed Name:			
Printed Title:	(Clerk- Secretary)		
Date:			
Place of Business:			
	AFFIX	CORPORATE SEAI	
COUNTERSIGNA	TURE:		
		Title of Officer)	
Date:			
	e clerk or Secretary is the sam	e person as the Office	r authorized to sign that contract
			rsigned by another officer of the
1	NATICK, N	<b>MASSACHUSETTS</b>	

BOARD OF SELECTMEN

# Contractor's Certification

Name of Project\_\_\_\_\_

A contractor will not be eligible for award of a contract unless such contractor has submitted the following certification, which is deemed a part of the resulting contract:

# CONTRACTOR'S CERTIFICATION

\_\_\_\_\_certifies that

- 1. it intends to use the following listed construction trades in the work under the contract ; and
- 2. will comply with the minority manpower ratio and specific affirmative action steps contained herein; and
- 3. will obtain from each of its Subcontractors and submit to the contracting or administering agency prior to the award of any subcontract under this contract the Subcontractor certification required by these bid conditions.

(Signature of authorized representative of Contractor)

Printed Name

Printed Title

Date

NATICK, MASSACHUSETTS BOARD OF SELECTMEN

# Subcontractor's Certification

Name of Project

Prior to the award of any subcontract, regardless of tier, the prospective Subcontractor must execute and submit to the contractor the following certification, which is deemed a part of the resulting contract:

\_\_\_\_certifies that

- 1. it intends to use the following listed construction trades in the work under the contract ; and
- 2. will comply with the minority manpower ratio and specific affirmative action steps contained herein; and
- 3. will obtain from each of its Subcontractors and submit to the contracting or administering agency prior to the award of any subcontract under this contract the Subcontractor certification required by these bid conditions.

(Signature of authorized representative of Subcontractor)

Printed Name

Printed Title

Date

In order to ensure that the said Subcontractor's certification becomes a part of all subcontracts under the contract, no subcontract shall be executed until an authorized representative of the Town agency (or agencies) administering this project has determined, in writing, that the said certification has been incorporated in such subcontract, regardless of tier. Any subcontract executed without such written approval shall be void.

#### PERFORMANCE BOND

# KNOW ALL PERSONS BY THESE PRESENTS: that

(Name of Contractor)	
(Address of Contractor)	
a, hereinafter called PRINCIPAL and (Corporation,	Partnership, or Individual)
(Name of Surety)	
(Address of Surety)	
hereinafter called Surety, are held and firmly bound unto	
Town of Natick, Massachusetts (Name of Owner)	
Natick Town Hall, 13 East Central Street, Natick, MA 01760 (Address of Owner)	
hereinafter called Owner, in the total aggregate penal sum of	
	Dollars (\$

THE CONDITION OF THIS OBLIGATION is such that whereas, the Principal entered into a certain contract with the Owner, dated the \_\_\_\_\_ day of \_\_\_\_\_\_ 201 \_\_\_\_, a copy of which is hereto attached and

made a part hereof for East Park Construction.

these presents.

Now, THEREFORE, if the Principal shall well, truly and faithfully perform its duties, all the undertakings, covenants, terms, conditions, and agreements of said Contract during the original term thereof, and any extensions thereof which may be granted by the Owner, with or without notice to the Surety and during the Owner, with or without notice to the Surety and during the Owner, with or without notice to the Surety and during the one (1) year guarantee period, and if the Principal shall satisfy all claims and demands incurred under such Contract, and shall fully indemnify and save harmless the Owner from all costs and damages which it may suffer by reason of failure to do so, and shall reimburse and repay the Owner all outlay and expense which the Owner may incur in making good any default, then this obligation shall be void, otherwise to remain in full force and effect.

PROVIDED, FURTHER, that the said security, for value received hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the contract or to Work to be performed thereunder or the Specifications accompanying same shall in any way affect its obligation on this Bond, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the Contract or to the Work or to the Specifications.

PROVIDED, FURTHER, that it is expressly agreed that the Bond shall be deemed amended automatically and immediately, without formal and separate amendments hereto, upon amendment to the Contract not increasing the Contract Price more than twenty percent (20%), so as to bind the Principal and the Surety to the full and faithful performance of the Contract as so amended. The term "Amendment", wherever used in this Bond, and whether referring to this Bond, the Contract or the Loan Documents shall include any alteration, addition, extension, or modification of any character whatsoever.

PROVIDED, FURTHER, that no final settlement between the Owner and the Principal shall abridge the right of the other beneficiary hereunder, whose claim may be unsatisfied. The Owner is the only beneficiary hereunder.

WITNESS WHEREOF, this instrument is number shall be deemed an original, this		
ATTEST:		
Principal		
(Principal Secretary)		
(SEAL)(s)	Ву	
		Signature
		Printed Name
		Printed Title
		(Address)
	(Surety	)
ATTEST:		
By		<u> </u>
(Witness as to Surety)		Attorney in Fact Signature
		Printed Name
		Printed Title
(Address)		

NOTE: Date of Bond must not be prior to date of Contract. If Contractor is partnership, all partners should execute Bond. IMPORTANT: Surety companies executing Bonds must appear on the Treasury Department's most current list (Circular 570 as amended) and be authorized to transact business in the State where the Project is located.

# PAYMENT BOND

# KNOW ALL PERSONS BY THESE PRESENTS: that

(Name of Contractor)

(Address of Contractor)

a \_\_\_\_\_\_, hereinafter called PRINCIPAL and (Corporation, Partnership, or Individual)

(Name of Surety)

(Address of Surety)

hereinafter called Surety, are held and firmly bound unto

the Town of Natick, Massachusetts

(Name of Owner)

Natick Town Hall, 13 East Central Street, Natick, MA 01760 (Address of Owner)

hereinafter called Owner, and unto all persons, firms, and corporations who or which may furnish labor, or who furnish materials to perform as described under the contract and to their successors and assigns in the total aggregate penal sum of \_\_\_\_\_\_

Dollars	(\$
	·

)

in lawful money of the United States, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, successors, and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION is such that whereas, the Principal entered into a certain contract with the Owner, dated the \_\_\_\_\_ day of \_\_\_\_\_ 20\_\_\_, a copy of which is hereto attached and made a part hereof for East Park Construction.

NOW, THEREFORE, if the Principal shall promptly make payment to all persons, firms, and corporations furnishing materials for or performing labor in prosecution of the Work provided for in such Contract, and any authorized extensions or modification thereof, including all amounts due for materials, lubricants, oil, gasoline, coal and coke, repairs on machinery, equipment and tools, consumed or used in connection with the construction of such Work, and for all labor cost incurred in such Work including that by a Subcontractor, and to any mechanic or materialman lienholder whether it acquires its lien by operation of State or Federal law; then this obligation shall be void, otherwise to remain in full force and effect.

PROVIDED, that beneficiaries or claimants hereunder shall be limited to the Subcontractors, and persons, firms, and corporations having a direct contract with the Principal or its Subcontractors.

PROVIDED, FURTHER, that the said Surety for value received hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the contract or to the Work to be performed thereunder or the Specifications accompanying the same shall in any way affect its obligation on this Bond, and it does hereby waive notice to the terms of this contract or to the Work or to the Specifications.

PROVIDED, FURTHER, that no suit or action shall be commenced hereunder by any claimant: (a) unless claimant, other than one having a direct Contract with the Principal, shall have given written notice to any two of the following: The Principal, the Owner, or the Surety above named within sixty-five (65) days after such claimant did or performed the last of the work or labor, or furnished the last of the materials for which said claim is made, stating with substantial accuracy the amount claimed and the name of the party to whom the materials were furnished, or for whom the work or labor was done or performed. Such notice shall be served by mailing the same by registered mail or certified mail, postage prepaid, in an envelope addressed to the Principal, Owner, or Surety, at any place where an office is regularly maintained for the transaction of business, or served in any manner in which legal process may be served in the state in which the aforesaid project is located, save that such service need not be made by a public officer. (b) After the expiration date of <u>one</u> (1) year following the date of which Principal ceased work on said Contract, it being understood, however, that if any limitation embodied in the Bond is prohibited by any law controlling the construction hereof, such limitation shall be deemed to be amended so as to be equal to the minimum period of limitation permitted by such law.

PROVIDED, FURTHER, that it is expressly agreed that this Bond shall be deemed amended automatically and immediately, without formal and separate amendments hereto, upon amendment to the Contract not increasing the Contract Price more than twenty percent (20%), so as to bind the Principal and the Surety to the full and faithful performance of the Contract as so amended.

The term "Amendment", wherever used in this Bond and whether referring to this Bond, the Contract or the Loan Documents shall include any alteration, addition, extension or modification of any character whatsoever.

PROVIDED, FURTHER, that no final settlement between the Owner and the Contractor shall abridge the right of any beneficiary hereunder, whose claim may be unsatisfied.

WITNESS WHEREOF, this instrument is executed in five (5) counterparts, each of which shall be deemed an original, this

day of	20
ATTEST:	
	Principal
(Principal Secretary)	-
(SEAL)(s)	By
	Signature
	Printed Name
	Printed Title
	(Address)
	(Surety)
ATTEST:	
By	
(Witness as to Surety)	Attorney-in-Fact Signature
	Printed Name
	Printed Title

(Address)

NOTE: Date of Bond must not be prior to date of Contract. If Contractor is partnership, all partners should execute Bond. IMPORTANT: Surety companies executing Bonds must appear on the Treasury Department's most current list (Circular 570 as amended) and be authorized to transact business in the State where the Project is located.

#### SECTION 00800

#### SUPPLEMENTARY CONDITIONS

#### Part I - AMENDMENTS TO GENERAL CONDITIONS

These Supplementary Conditions amend or supplement the Standard General Conditions of the Construction Contract (EJCDC No. C-700, 2002 Edition)(the General Conditions) and other provisions of the Contract Documents as indicated below. All provisions which are not so amended or supplemented remain in full force and effect.

Paragraphs or subparagraphs as noted below are required by or are intended to be consistent with the requirements of Massachusetts statutes governing public construction contracts in the Commonwealth of Massachusetts (the "Commonwealth"). Any other provisions required by statute to be included herein shall be deemed to be so included. In addition, the Owner and Contractor recognize that other rights, duties and obligations with respect to public construction contracts are provided for by statute, notwithstanding the fact that they are not provided for in the Contract Documents. In case of conflict between the asterisked provisions and other provisions of the Contract Documents, the asterisked provisions shall govern. In case of conflict between the provisions of any applicable statute, the statutory provisions shall govern. Where the term "Awarding Authority" appears in any asterisked provision, it shall mean the Owner.

#### **ARTICLE 1 – DEFINITIONS AND TERMINOLOGY**

#### SC-1.01 Defined Terms

Delete the definition of 5. Bid in its entirety and insert in its place the following:

"Bid shall mean the price submission by the individual, partnership, corporation, or other entity setting forth the monetary amount of the total contract, together with any unit prices requested, on a form prescribed by the Owner, pursuant to M.G.L. c. 149, §§44A et seq.."

Delete the definition of 6. Bidder in its entirety and insert in its place the following:

"Bidder shall mean the individual, partnership, corporation, or other entity who submits a Bid pursuant to an Invitation for Bids by the Owner."

Delete the definition of 7. Bidding Documents in its entirety and insert in its place the following:

"Bidding documents shall mean any and all documents issued by the Owner in requesting Bids pursuant to M.G.L. c.149, §§44A et seq., which shall include, but shall not be limited to, the Invitation for Bids, the Information for Bidders, Bid Bond (if any), Performance Bond, Payment Bond, Contract, General Conditions of the Contract, Supplementary General Conditions of the Contract, Supplier Diversity Office (SDO) Forms (if applicable), Minimum Prevailing Wage Rates (as applicable), and other additional information provided to potential Bidders by the Owner."

Delete the definition of 8. Bidding Requirements in its entirety and insert in its place the following:

"Bidding requirements shall mean any and all requirements contained in any portion of the Bidding Documents issued by the Owner."

Delete the definition of 9. Change Order in its entirety and insert in its place the following:

"Change Order shall mean a written order to the Contract signed to show the recommendation of the Project Manager, if any, the approval of the Engineer and the authorization of the Owner, executed with the same formality as the Contract, issued after the execution of the Contract, authorizing a change in the Work or an adjustment in the Contract Sum or the Contract Time. The Contract Sum and Contract Time may be changed only by Change Order. A Change Order signed by the Contractor indicates the Contractor's Contract therewith, including the adjustment in the Contract Sum or the Contract Time.

A Change Order request may originate with the Owner, the Engineer, if any, or the Contractor and shall be submitted to the Owner. The Change Order request shall be made in writing and in accordance with the provisions of the Contract and applicable procedures of the Owner. The term equitable adjustment, as used in this paragraph, shall include all adjustments to the Contract Price or to the Time to which the Contractor is entitled, pursuant to M.G.L. c.30, Sections 39N and 39O. Such equitable adjustment shall be made in accordance with the provisions of this Article.

A Change Order may be submitted for changes in the Contract work, including but not limited to, changes in:

- a. the plans and specifications
- b, in the method or manner or performance of the work; and/or
- c. in the schedule for performance of the work."

In the definition of 11. Contract, insert the following sentence at the end:

"The word "Agreement" in the Bidding Requirements or Contract Documents shall mean the same as the word Contract."

Delete the definition of 12. Contract Documents and insert in its place the following:

"Contract documents are those documents enumerated in the written Agreement between the Owner and Contractor (hereinafter the Agreement) and consist of the Agreement, the General Conditions of the Contract, the Supplementary General Conditions of the Contract, other Conditions of the Contract, Drawings, Specifications, Addenda issued prior to the execution of the contract, other documents listed in the Agreement, and modifications issued after the execution of the Contract. A modification is a written amendment signed by both parties to the Agreement, a Change Order, a Work Change Directive, or a minor written change in the Work Ordered by the Engineer (Field Order)."

Delete the definition of 22. Hazardous Environmental Condition and insert in its place the following:

"Hazardous Environmental Condition is the presence at the Site of Asbestos, PCBs, Petroleum, Hazardous Waste, Radioactive Material or other material in such quantities or circumstances that may present a substantial or notable danger or harm to persons or property exposed thereto in connection with the Work."

Delete the definition of 24. Laws and Regulations; Laws or Regulations and insert in its place the following:

"Laws and Regulations shall mean all Federal, Massachusetts and Town of Natick law applicable to his work including, without limitation, statutes, by-laws, rules, regulations, orders and directives, as amended, and including, without limitation, the Williams-Steiger Occupational Safety and Health Act, as amended, and related regulations, as amended, in effect throughout the term of the Contract and any extension or renewal thereof, with which the Contractor shall be required to comply. Without limitation, the Contractor shall comply with the provisions of Chapter 149, Section 26 to 27D of the Massachusetts General Laws, as amended, and the applicable minimum prevailing wage rates as determined by the Massachusetts Commissioner of Labor and Industries. The Contract shall be considered to include in their entirety all terms respecting workers' compensation insurance and other terms required to be included in it by Chapter 152 of the Massachusetts General Laws, as amended, and any other laws, as though such terms were set forth in their entirety herein."

Delete the definition of 29. Owner and insert in its place the following:

"Owner, sometimes referred to as Town or Awarding Authority, is the Town of Natick, a body corporate and politic located in Natick, Middlesex County, Massachusetts. The Owner and its authorized representatives, as well as Engineer and Owner's Project Manager, if any, shall at all times have access to and be permitted to observe and review all Work, materials, payrolls, records of personnel, conditions of employment, invoices for materials, and generally all records relating to the Work. No member, officer, agent, employee, representative or official of the Owner shall in any way, directly or indirectly, be personally liable, under any provisions of the Contract."

In the definition of 36. Related Entity, insert "board, commission, committee or member thereof" between "employee" and "agent".

Delete the definition of 45. Substantial Completion in its entirety and insert in its place the following definition:

"45. Substantial Completion shall mean either that the Work required by the Contract has been completed except for Work having a Contract Price of less than one (1) percent of the then adjusted total Contract Price, or substantially all of the work has been completed and opened to public use except for minor incomplete or unsatisfactory work items that do not materially impair the usefulness of the Work required by the Contract."

Delete the definition of 46. Successful Bidder in its entirety and insert in its place the following:

"Successful bidder shall mean the lowest responsible and eligible bidder, as defined in M.G.L. c. 149, §§44A et seq., on the basis of competitive bids publicly opened and read by the Awarding Authority forthwith upon expiration of the time for the filing thereof; provided, however, that the Awarding Authority may reject any and all bids, if it is in the public interest to do so."

Add the following to the definition of 51. Work:

"All Work mentioned or indicated in the Contract Documents shall be performed by the Contractor as part of the Contract unless it is specifically indicated in the Contract Documents that such Work is to be done by others. Should the Drawings or the Specifications disagree in themselves or with each other, the Contractor shall provide the better quality or greater quantity of Work unless otherwise directed by written addendum to the Contract. All indications or notations which apply to one of a number of similar situations, materials or processes shall be deemed to apply to all such situations, materials or processes wherever they appear in the Work, except where a contrary result is clearly indicated by the Contract Documents. Where codes, regulations, standards, requirements and publications of public and private bodies are referred to in the Specifications, references shall be understood to be to the latest revision prior to the date of receiving bids, except where otherwise indicated. Where no explicit quality or standards for workmanship are established for Work, such Work is to be of good quality and consistent with the quality required by the Contract Documents. The Drawings are diagrammatic only, and are not intended to show the alignment, physical locations or configurations of such Work. The Owner and Engineer assume no liability arising out of jurisdictional issues raised or claims advanced by trade organizations or other interested parties based on the arrangement or manner of subdivision of the content of the Drawings and Specifications. The Contractor shall make all necessary arrangements to reconcile any such jurisdictional conflicts without delay, damage or cost to the Owner, unless otherwise agreed by the parties hereto."

Delete the definition of 52. Work Change Directive in its entirety and insert in its place the following:

"Work Change Directive shall mean a written order prepared by the Engineer and signed off on by the Owner and Engineer, directing a change in the Work prior to agreement on adjustment, if any, in the Contract Price or Contract Times, or both. The Owner may, by Work Change Directive, without invalidating the Contract, order changes in the Work within the general scope of the Contract, consisting of additions, deletions, or other revisions, the Contract Price and Contract Times being adjusted accordingly."

Add the definition of "Complete and/or Completion" after paragraph 52, which is to read as follows:

"53. Complete and/or Completion - Whenever the word "Complete and/or Completion" is utilized in the Contract in reference to work completed when referring to the completion date of the contract and the assessment of liquidated damages, it shall be understood to mean that all work on the project is completed, the facilities are fully operational, the data required to closeout the project has been submitted and approved, and incidental items included in the closeout punch list have been completed to the Owner's satisfaction".

#### **ARTICLE 2 - PRELIMINARY MATTERS**

- SC-2.01-B Delete paragraph 2.01-B of the General Conditions in its entirety.
- SC-2.03-A Delete the last sentence of paragraph 2.03-A.

# **ARTICLE 3 – CONTRACT DOCUMENTS: INTENT, AMENDING, REUSE**

SC-3.01 The last clause in paragraph 3.01-B of the General Conditions shall read:

"shall be provided by the Contractor, at no additional cost to the Owner, whether or not specifically called for".

SC-3.01-D Add a new section 3.01-D to the General Conditions as follows:

"In the event of any conflict among the Contract Documents, the Documents shall be construed according to the following priorities:

Highest Priority:	Amendments	
Second Priority:	Contract	
Third Priority:	Addendalater date to	
	take precedence	
Fourth Priority:	Supplementary General	
	Conditions	
Fifth Priority:	General Conditions	
Sixth Priority:	Division 1, General	
Requirements		
Seventh Priority:	Technical Specifications	
Eighth Priorit	y: Drawings, with larger	
scale drawings to take precedence		
Ninth Priority	r: Invitation to Bid,	
Instruction to	Bidders, The Contractor's General	
Bid.		

Notwithstanding the order of priority of documents set forth in Subparagraph 3.01-D, any matters contained in the Specifications which have been omitted from the Drawings or vice versa shall be construed as though contained in both. In the event of any duplication, conflict, or discrepancy between the Drawings and the Specifications or between other contract clauses, so far as the same pertains to the Drawings, the Specifications or any modifications to the Drawings or the Specifications, the matter shall be promptly brought to the attention of the Engineer, without whose instructions the Contractor shall not adjust the matter except at his own risk. Any instructions of the Engineer shall be given in writing."

SC-3.02 Insert a new paragraph SC-3.02-A.3 in the General Conditions as follows:

"Paragraphs or subparagraphs herein are intended to be consistent with the requirements of Massachusetts statutes governing public building construction contracts in the Commonwealth. Any other provisions required by statute to be included herein shall be deemed to be so included. In addition, the Owner and Contractor recognize that other rights, duties and obligations with respect to public construction contracts are provided for by statute, notwithstanding the fact that they are not provided for in the Contract Documents."

SC-3.03 Insert the following language at the beginning of the second sentence in paragraph 3.03-A.2 of the General Conditions:

"In the event that such a conflict, error, ambiguity or discrepancy actually exists which requires an amendment or supplement to the Contract Documents,".

SC-3.04 Insert a new paragraph 3.04-C in the General Conditions as follows:

No officer, official, agent or employee of the Town of Natick shall have the power to amend, modify or alter the Contract or waive any of its provisions or to bind the Town of Natick by making any promise or representation not contained herein except by an amendment, in writing, executed by the Owner in the same manner as the Contract is executed. Neither party may rely on any conduct, statement, action, inaction or course of conduct of the employees, agents or officers of the other party as having changed, modified or amended the Contract. Neither party shall be construed as waiving any provision of the Contract unless the waiver is executed in writing as an amendment to the Contract. No waiver by either party of any default or breach shall constitute a waiver of any subsequent default or breach. Forbearance or indulgence in any form or manner by either party shall not be construed as waiver of any term or condition hereto nor shall it limit the legal or equitable remedies available to that party.

Information or services required of the Owner hereunder shall be furnished by the Owner with reasonable promptness and in accordance with M.G.L. c.30, §39P, as applicable, after receipt from the Contractor of a reasonably detailed written request for such information or services. Reference is made to General Laws Chapter 30, Section 39P, the provisions of which are incorporated herein."

SC-3.05 In paragraph 3.05-A.2 of the General Conditions, in the third line, insert "prior" between "without" and "written" and in the fourth line, insert "prior" between "specific" and "written".

# ARTICLE 4 - AVAILABILITY OF LANDS; SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS ENVIRONMENTAL CONDITIONS, REFERENCE POINTS

- SC-4.01 Insert the following language at the end of the third sentence of paragraph 4.01-A of the General Conditions ", which easements are required under the circumstances".
- SC-4.01-C Add the following language to the last sentence in paragraph 4.01-C of the General Conditions: ", at his own expense and without liability to the Owner"
- SC-4.01-B Delete paragraph 4.01-B of the General Conditions in its entirety.

SC-4.03 Delete paragraph 4.03 A, B and C of the General Conditions in their entirety and insert in its place the following language:

"(Statutory reference: M.G.L. c.30 §39N)

If, during the progress of the work, the Contractor or the Awarding Authority discovers that the actual subsurface or latent physical conditions encountered at the site differ substantially or materially from those shown on the plans or indicated in the Contract Documents, either the Contractor or the Awarding Authority may request an equitable adjustment in the contract price of the Contract applying to work affected by the differing site conditions. A request for such an adjustment shall be in writing and shall be delivered by the party making such claim to the other party as soon as possible after such conditions are discovered. Upon receipt of such a claim from a Contractor, or upon its own initiative, the Awarding Authority shall make an investigation of such physical conditions, and, if they differ substantially or materially from those shown on the plans or indicated in the Contract Documents or from those ordinarily encountered and generally recognized as inherent in work of the character provided for in the plans and Contract Documents and are of such a nature as to cause an increase or decrease in the cost of performance of the work or a change in the methods required for the performance of the work which results in an increase or decrease in the cost of the work, the Awarding Authority shall make an equitable adjustment in the Contract price and the Contract shall be modified in writing accordingly.

If the Contractor claims that any acts or omissions of the Owner or the Engineer, including any instructions or orders, whether oral, written, by Drawings, or otherwise, involve extra cost or time, and the Contractor has not received a written acknowledgment by the Owner or Engineer that extra payment will be made or time extended on account thereof, the Contractor shall promptly so notify the Engineer in writing of such Claim and shall not proceed with the Work relating to such Claim until the Contractor has received a further written order to proceed in accordance with this Agreement. No Claim by the Contractor on account of such acts, omissions, instructions or orders shall be valid unless the Contractor has so notified the Engineer in writing, before proceeding, and has received the further written order to proceed.

The Contractor shall have the burden of demonstrating the effect of the claimed delay on the Contract Time, and shall furnish the Engineer with such documentation relating thereto as the Engineer may reasonably require. Estimates of the extension of time shall be accompanied by a schedule showing how the Critical Path has been affected."

SC-4.04 Insert the following sentence just prior to the last sentence of paragraph 4.04-A of the General Conditions:

"The locations of existing underground facilities shown on the Contract Drawings are approximate only, and are included to indicate that the underground facilities are present, and it shall be the Contractor's responsibility to make arrangements with all utility companies for field locations. The Contractor shall also contact "Dig Safe" and other appropriate departments, agencies and companies to insure that all underground facilities are located prior to excavation, regardless of the fact that they may or may not be shown on the Contract Drawings".

- SC-4.04-B.2 Delete the final sentence of paragraph 4.04-B.2 of the General Conditions.
- SC-4.06 Insert the following sentence after paragraph 4.06-A of the General Conditions:

"The following reports and drawings relating to a Hazardous Environmental Condition identified at the site have been utilized by the Engineer in the preparation of the Contract Documents.

- None"
- SC-4.06-C Insert the following sentence at the end of paragraph 4.06-C of the General Conditions:

"Nothing in the Contract Documents shall limit the responsibility of the Contractor for any Hazardous Environmental Condition which is caused by the Contractor or by any of its officers, employees, boards, commissions, committees, agents or representatives."

SC-4.06-D Insert the following sentences at the end of paragraph 4.06-D of the General Conditions:

"In that event Contractor and its officers, employees, agents and representatives shall have no authority to handle, transport, remove or dispose of any materials the presence of which at the site constitutes a Hazardous Environmental Condition. In any event Contractor shall be liable for its negligence or willful misconduct."

SC-4.06-G Delete paragraph 4.06-G of the General Conditions.

#### **ARTICLE 5 - BONDS AND INSURANCE**

SC-5.01 Delete paragraph 5.01-A of the General Conditions in its entirety and insert in its place the following:

"As required by M.G.L. c. 149, §44E, or by these Supplementary Conditions, the Contractor shall furnish a Performance Bond, acceptable to the Town of Natick, as security for the faithful performance of its obligations under the Contract. Said Performance Bond shall be in the amount of one hundred percent (100%) of the Contract Price and shall be issued by a surety company qualified to do business under the laws of the Commonwealth of Massachusetts and approved by the Owner. Said Performance Bond shall obligate the Contractor, its surety, and their successors and assigns for all of the work required to be performed by the Contractor under the Contract. Said Performance Bond shall remain in effect no less than one (1) year after the expiration of the term of the Contract, or any extension or renewal thereof.

As also required by M.G.L. c. 149, §44E, or by these Supplementary Conditions, the Contractor shall furnish a Payment Bond, acceptable to the Town of Natick, as security for the faithful payment of its obligations under the Contract. Said Payment Bond shall be in the amount of one hundred percent (100%) of the Contract Price and shall be issued by a surety company qualified to do business under the laws of the Commonwealth of Massachusetts and approved by the Owner. Said Payment Bond shall obligate the Contractor, its surety, and their successors and assigns to pay for labor, materials and equipment furnished for use regarding the work to be performed by the Contractor under the Contract. Said Payment Bond shall remain in effect no less than one (1) year after the expiration of the term of the Contract, or any extension or renewal thereof."

SC-5.04 Insert the following language at the end of paragraph 5.04-B.1 of the General Conditions:

"Notwithstanding any other provision of the Contract Documents, the Contractor shall provide to the Owner, with its proof of insurance coverage, endorsements or riders to the policies of Commercial General Liability Insurance, Automobile Liability Insurance, and Excess Liability Insurance, Umbrella Form, which indicate that the Town of Natick and the Engineer are named as additional insureds on each such policy."

SC-5.04 Add the following language after paragraph 5.04.B-5 of the General Conditions:

"Each certificate and policy of insurance required by this Agreement shall contain a cancellation provision as indicated below with **no variations**.

The above policies will not be cancelled or materially amended before the expiration date thereof, until at least thirty (30) days prior written notice has been given to the certificate holders and the named insured and the Owner."

SC-5.04 Add the following paragraphs at the end of paragraph 5.04-B.2 of the General Conditions:

"5.04-B-2.a "The Contractor shall provide and maintain throughout the term of the Contract and any extension or renewal thereof the following insurance with companies that are authorized and licensed in the Commonwealth of Massachusetts to issue policies for the coverages and limits so required. The Contractor shall also ensure that any and all Subcontractors and sub-subcontractors provide insurance in the following limits and that the Town of Natick is named as an additional insured and meet the following requirements.

- A-1 <u>Commercial General Liability</u> including but not limited to:
  - 1. Premises/Operations
  - 2. Products/Completed Operations
  - 3. Contractual
  - 4. Independent Contractors
  - 5. Broad Form Property Damage
  - 6. Personal Injury
  - 7. Medical Expense
  - 8. Underground Explosion and Collapse Hazard (XCU)
- A-2 Limits for Commercial General Liability at a minimum shall be:

1.	General Liability	
	General Aggregate	\$2,000,000.
	Each Occurrence	\$1,000,000.

- 2. Products/Completed Operations \$2,000,000.
- 3. Personal Injury \$1,000,000.
- 4. Medical Expense \$ 5,000.

#### B-1 <u>Automotive Liability</u> including but not limited to:

- 1. Scheduled Autos
- 2. Hired Autos
- 3. Non-Owned Autos
- B-2 Limit for Automotive Liability at a minimum shall be:
  - 1. Combined Single Limit \$1,000,000.
- C-1 <u>Worker's Compensation and Employer's Liability</u>
- C-2 Limits for Worker's Compensation and Employer's Liability at a minimum shall be:
  - 1. Worker's Compensation

Statutory Amount

2. Employer's Liability

Each Accident	\$1,000,000.
Disease - Policy Limit	\$1,000,000.
Disease - Each Employee	\$1.000,000.

- D-1 Provide <u>Excess Umbrella for Liability Coverage</u>. Use of Umbrella to meet other insurance limits will not be accepted. Limits for liability at a minimum shall be:
  - 1.Each Occurrence\$5,000,000
  - 2. General Aggregate \$5,000,000

Excess Liability Insurance, Umbrella Form shall be following form, providing coverage over commercial general liability insurance, automobile liability insurance, and employer's liability under workers' compensation insurance.

- E-1 Failure to provide and continue in force such insurance as aforesaid shall be deemed a material breach of the Contract and shall operate as an immediate termination thereof.
- F-1 Certificates evidencing such insurance in five (5) copies shall be furnished to the Town of Natick at the execution of the Contract. Such certificates shall not merely name the types of policies provided, but shall specifically refer to the Contract and shall state that such insurance is as required by the Contract. With the certificates, the Contractor shall submit an insurance certification form from insurer/insurers, indicating that the coverages provided do in fact satisfy all the insurance requirements listed under ARTICLE 5 of the General Conditions, and the amendments thereto under the Supplementary Conditions. The insurance certification form is included in Part II of the Supplementary Conditions.

The Contractor shall also be required to provide to the Owner with its proof of insurance coverage endorsements or riders to the policies of commercial general liability insurance, automobile liability insurance, and excess umbrella liability insurance, umbrella form, which indicate that the Town of Natick is named as an additional insured on each such policy.

No insurance shall be obtained from an insurer which:

- a. is not licensed to sell insurance in the Commonwealth of Massachusetts; or
- b. is not authorized to provide insurance as an excess or surplus lines insurer, and does not have a current Best's rating of A or better."

- G-1 The Contractor shall make no claims against the Town of Natick or its officers for any injury to any officers or employees or for damage to its equipment arising out of work contemplated by the Contract."
- SC-5.05 Delete paragraph 5.05 of the General Conditions in its entirety, and insert the following paragraphs in its place:

"5.05-A Contractor shall purchase and maintain a <u>separate</u> Owner's Protective Liability policy, issued to Owner at the expense of Contractor, with the <u>Owner</u> and <u>Engineer</u> only as named insured. This insurance shall provide coverage for not less than the following amounts:

1.	General Aggregate	\$3,000,000.
2.	Each Occurrence	\$1,000,000.

5.05-A.1. A rider on the Contractor's Liability Insurance will not be acceptable."

5.05.-A.2 The provisions of paragraph 5.04-B.2.aE-1 and 5.04B-2.aF-1 of the General Conditions are incorporated herein by reference.

SC-5.06 Delete paragraph 5.06-A of the General Conditions in its entirety and insert the following paragraph in its place:

"5.06-A. For projects that includes work within existing structures or buildings, the Contractor shall be required to provide <u>Installation Floater</u> coverage in the full amount of the work being performed, and for projects that include construction of a new structure or building, the Contractor shall provide <u>Builder's All-Risk</u> coverage in the full value of the structure and contents. This insurance shall:"

SC-5.06-A.1 Add the following sentence to the end of paragraph 5.06-A.1 of the General Conditions, as follows:

"The additional insured for this project shall be the Owner and Engineer."

- SC-5.06 Delete paragraphs 5.06-B, C, D, E of the General Conditions in their entirety.
- SC-5.07 Delete paragraphs 5.07-A and 5.07-B and 5.07-C of the General Conditions in their entirety, and insert the following paragraphs in their place:
   "5.07 The Contractor shall waive all rights against the Owner for all losses and damages caused by any perils covered by the policies of insurance provided in response to paragraph SC-5.06 of the Supplementary Conditions and any other property insurance applicable to the Work, and also waive such rights against the Subcontractors, Engineer, Engineer's consultant and all other parties named as insured in such policies for loss and damages so caused.

5.07.1 As required by paragraph 6.06-G of the General Conditions each subcontract between Contractor and a Subcontractor will contain similar waiver provisions by the Subcontractor in favor of Owner, Contractor, Engineer, Engineer's consultants and all other parties named as insureds.

5.07.2 All such policies provided in response to paragraph 5.06 of the General Conditions, as amended in SC-5.06 of the Supplementary Conditions shall contain provisions to the effect that in the event of payment of any loss or damage the insurer will have no rights or recovery against the Owner, Engineer or Engineer's consultant."

- SC-5.08 Delete paragraph 5.08-A and 5.08-B of the General Conditions in their entirety.
- SC-5.09 Delete paragraph 5.09 of the General Conditions in its entirety and insert the following paragraph in its place:

"5.09 If Owner has any objection to the coverage afforded by or other provisions of the insurance required to be purchased and maintained by Contractor in accordance with paragraph 5.02 thru 5.06 on the General Conditions, as amended by SC-5.04 thru SC-5.06 of the Supplementary Conditions, on the basis of its not complying with the Contract Documents. Owner will notify Contractor in writing thereof within fourteen (14) days of the date of delivery of such certificates to Owner in accordance with paragraph 2.01-B. Contractor will provide such additional information in respect of insurance provided by him as Owner may reasonably request."

#### **ARTICLE 6 - CONTRACTOR'S RESPONSIBILITIES**

SC-6.01-A and 6.01-B Delete paragraphs 6.01A and 6.01B of the General Conditions and insert in their place the following:

"The Contractor shall employ a competent superintendent, reasonably acceptable to the Owner, and necessary assistants who shall be in attendance at the Project site full time and at all times during the progress of the Work until the date of Substantial Completion, and for such additional time thereafter as the Engineer may determine to be necessary for the expeditious completion of the Work. The Contractor shall remove the superintendent if requested to do so in writing by the Owner or by the Engineer on behalf of the Owner, and shall promptly replace him with a competent person reasonably acceptable to the Owner, at no increase in the Contract Sum or Contract Time.

The Contractor shall not replace such superintendent without the prior written approval of the Engineer.

The Contractor shall retain a competent engineer or surveyor who shall establish sufficient lines and grades for the Work.

The Contractor shall coordinate and supervise the Work performed by Subcontractors to the end that the Work is carried out without conflict between trades and so that no trade, at any time, causes delay to the general progress of the Work. The Contractor and all Subcontractors shall at all times afford each trade, any separate contractor, or the Owner, every reasonable opportunity for the storage of materials.

The Contractor shall arrange for and attend job meetings with the Engineer and such other persons as the Engineer and the Owner may from time to time wish to have present. The Contractor shall be represented by a principal, or project manager, as well as by the Contractor's own superintendent. An authorized representative of any Subcontractor or Sub-subcontractor shall attend such meetings if the representative's presence is requested by the Engineer. Such representatives shall be empowered to make binding commitments on all matters to be discussed at such meetings, including costs, payments, Change Orders, time schedules and manpower. Any notices required under the Contract may be served on such representatives.

The Contractor warrants that its financial condition is sound and that the Contractor shall be capable of obtaining any bonds required by the Contract Documents. The Contractor shall promptly advise the Owner of any occurrence, event, fact, or other matter that has had or will have a materially adverse effect upon the financial condition of the Contractor.

The Contractor hereby represents and warrants to the Owner that the Contractor is a business entity which is experienced and skilled in the construction of projects of the type described in the Contract Documents, is licensed to engage in the general construction business in the Commonwealth of Massachusetts, and is in compliance with all applicable governmental laws and regulations and all case law relative thereto.

Before starting the Work, and at frequent intervals during the progress thereof, the Contractor shall carefully study and compare the Contract Documents with each other and with the information furnished by the Owner, the Engineer and the Contractor and shall at once report to the Engineer any error, inconsistency or omission the Contractor may discover. Any necessary change shall be ordered as provided in the Contract Documents. If the Contractor proceeds with the Work without such notice to the Engineer, having discovered such errors, inconsistencies or omissions, or if by reasonable study of the Contract Documents the Contractor could have discovered such errors, inconsistencies or omissions the Contractor shall bear all costs arising therefrom."

- SC-6.02-B In paragraph 6.02-B of the General Conditions, in the seventh line, insert "prior" between "Owner's" and "written".
- SC-6.05-A Delete paragraph 6.05-A of the General Conditions, in its entirety and insert in its place the following:

"Specifications for such contracts, and specifications for contracts awarded pursuant to the provisions of said sections forty-four A to forty-four L of said chapter one hundred and forty-nine, shall be written to provide for full competition for each item of material to be furnished under the contract; except, however, that said specifications may be otherwise written for sound reasons in the public interest stated in writing in the public records of the awarding authority or promptly given in writing by the awarding authority to anyone making a written request therefor, in either instance such writing to be prepared after reasonable investigation. Every such contract shall provide that an item equal to that named or described in the said specifications may be furnished; and an item shall be considered equal to the item so named or described if, in the opinion of the awarding authority: (1) it is at least equal in quality, durability, appearance, strength and design, (2) it will perform at least equally the function imposed by the general design for the public work being contracted for or the material being purchased, and (3) it conforms substantially, even with deviations, to the detailed requirements for the item in the said specifications. For each item of material the specifications shall provide for either a minimum of three named brands of material or a description of material which can be met by a minimum of three manufacturers or producers, and for the equal of any one of said named or described materials." Statutory reference M.G.L. c. 30, §39M(b)

- SC-6.05-A.2.d.2) and 3) In paragraphs 6.05-A.2.d.2) and 3) of the General Conditions, delete the first word "will" and insert in its place the word "shall".
- SC-6.05-B In paragraph 6.05-B of the General Conditions, in the sixth line, insert "in advance, in writing," between "approved" and "by".
- SC-6.05-F Add the following language to the end of paragraph 6.05-F of the General Conditions.

"Contractor shall submit to the Engineer for review, drawings to scale, showing the effect this substitute will have upon the adjoining materials, piping, equipment, etc., at no additional cost to the Owner."

SC-6.06-B Add the following to the end of paragraph 6.06-B of the General Conditions: "The Contractor shall be required to submit to the Owner a list of Subcontractors it intends to use at a certain date to be specified by the Owner. The Contractor shall not use any Subcontractor to which the Owner objects and to which the Owner provides written notice of such objection to the Contractor."

- SC-6.06-C.2 In paragraph 6.06-C.2 of the General Conditions, in the first line, delete the words "anything in the Contract Documents".
- SC 6.07-B Delete paragraph 6.07-B of the General Conditions in its entirety and insert in its place the following:

"To the fullest extent permitted by law, the Contractor shall indemnify, defend, and hold harmless the Town of Natick and the Engineer and all of their officers, employees, boards, commissions, committees, agents and representatives from and against all claims, causes of action, suits, costs, damages, and liability of any kind which arise out of the Contractor's or subcontractors' infringement of patent rights or copyrights incident to the use in the performance of the Work of, or resulting from the Contractor's or subcontractors' incorporation of, any invention, design, product or device not specified in the Contract Documents.

Neither the Town of Natick, nor the Engineer, nor any of their officers, employees, boards, committees, commissions, agents and representatives shall be under any personal obligation or shall incur any personal liability by reason of this Contract, the execution thereof or anything relating thereto which arises out of the Contractor's or a subcontractor's infringement of patent rights or copyrights incident to the use in the performance of the Work of, or resulting from the Contractor's or a subcontractor's incorporation of, any invention, design, product or device not specified in the Contract Documents.

Nothing herein shall modify the Contractor's general indemnification obligations, as set forth in this Agreement."

SC-6.08 Delete paragraph 6.08 of the General Conditions in its entirety and insert in its place the following:

"It is the specific responsibility of the Contractor to make, in proper and timely fashion, all necessary notifications to relevant federal, state, and local governing bodies and to obtain and comply with the provisions of all permits, inspections or applications required by the work specified, as well as to make all required submittals required under those auspices. The Contractor shall indemnify the Owner from, and pay for all claims resulting from, failure to adhere to these requirements. The Contractor shall promptly provide the Engineer and the Owner with reproductions of all permits, licenses and permissions.

The Owner has waived the building permit fee only for this Project. All other pertinent permit and inspectional service fees shall apply.

The Contractor shall pay the then current inspection fee to the Town of Natick for all inspections required by state and local codes, and required by the Town of Natick.

The Contractor shall pay all charges of utility companies for connections to the Work. The Contractor shall be aware of, observe and comply with all laws, ordinances, regulations, orders, permits, licenses, etc., and shall conduct his operations in compliance thereto, and shall indemnify the Owner and Engineer from any claim or liability arising from, or based upon a violation of same."

SC-6.09-A Delete paragraph 6.09-A of the General Conditions in its entirety and insert in its place the following:

"The Contractor shall comply with all provisions of Federal, Massachusetts and Town of Natick law applicable to his work including, without limitation, statutes, by-laws, rules, regulations, orders and directives, as amended, and including, without limitation, the Williams-Steiger Occupational Safety and Health Act, as amended, and related regulations, as amended, in effect throughout the term of this Contract and any extension or renewal thereof. Without limitation, the Contractor shall comply with the provisions of Chapter 149, Section 26 to 27D of the Massachusetts General Laws, as amended, and the applicable minimum prevailing wage rates as determined by the Massachusetts Commissioner of Labor and Industries. This Contract shall be considered to include in their entirety all terms respecting workers' compensation insurance and other terms required to be included in it by Chapter 152 of the Massachusetts General Laws, as amended, and any other laws, as though such terms were set forth in their entirety herein."

- SC-6.10-A In the third and fourth lines of paragraph 6.10-A of the General Conditions delete the words Place of the Project" and insert in their place the words "Commonwealth of Massachusetts".
- SC-6.10 Add the following language at the end of paragraph 6.10-A of the General Conditions:

The Town is exempt from Commonwealth of Massachusetts sales tax. M.G.L. c.64,  $\S6(h)$  exempts "sales of building materials and supplies to be used in the construction, reconstruction, alteration, remodeling or repair of (1) any building structure, public highway, bridge or other public works owned by or held in trust for the benefit of any governmental body or agency mentioned in paragraph (d) and used exclusively for public purposes; (2) any building or structure owned by or held in trust for the benefit of any corporation, foundation, organization or institution described in paragraph (e) and used exclusively in the conduct of its religious, scientific, charitable or educational purposes; and (3) any building, structure, residence, school or other facility included under any written contract dated on or after January 1, 1985 arising out of or related to the Massachusetts Port Authority residential and school soundproofing programs, notwithstanding whether such building, structure, residence, school or other facility is owned by or held in trust for the benefit of the Massachusetts Port Authority or is used exclusively for public purposes; provided, however, that such governmental body or agency or such corporation, foundation, organization or institution shall have first obtained a certificate from the Commissioner stating that it is entitled to such exemption and the vendor keeps a record of the sales price of each such separate sale, the name of the purchaser, the date of each such separate sale and the number of such certificate. In this paragraph the words "building materials and supplies" shall include all materials and supplies consumed, employed or expended in the construction, reconstruction, alteration, remodeling or repair of any building, structure, public highway, bridge or other such public work, as well as such materials and supplies physically incorporated therein. Said terms shall also include rental charges for construction vehicles, equipment and machinery rented specifically for use on the site of any such tax exempt project or while being used exclusively for the transportation of materials for any such tax exempt project." M.G.L. c.64I, §7 exempts from use tax "Sales exempt from the taxes imposed under chapter sixty-four H; provided, however, that in the case of the purchase of any motor vehicle or trailer, as defined in section one of chapter ninety, or any boat or airplane, other than from a vendor who is regularly engaged in the business of making sales at retail of such motor vehicles, trailers, boats or airplanes, the receipts from which are exempt from the tax imposed under said chapter sixty-four H, the purchaser thereof, except when said purchaser is the spouse, mother, father, brother, sister or child of the seller, shall pay the tax imposed by this chapter". The Contractor shall not pay, and the Town shall not reimburse or pay the Contractor or any other party, either directly or indirectly, for this or any other tax for which an exemption is provided under law. The Town will provide a state sales tax exemption number to the Contractor for use with response to this Project."

SC-6.11 Delete paragraph 6.11-A of the General Conditions in its entirety and insert in its place the following:

"The right of possession of the premises shall remain at all times in the Owner.

The Contractor's right to entry and use thereof arises solely from the permission granted by the Owner under the Contract Documents. The Contractor shall confine the Contractor's apparatus, the storage of materials and the operations of the Contractor's workmen to limits indicated by Laws and Regulations, the Contract Documents, permits, and/or directions of the Engineer and shall not unreasonably encumber the premises with the Contractor's materials. The Owner shall not be liable to the Contractor, the Subcontractors, their employees or anyone else with respect to the conditions of the premises, except only for a condition caused directly and solely by the negligence of the Owner.

The Contractor shall at all times maintain a safe workplace, in full compliance with all federal, state, and local health and safety Laws and Regulations and shall indemnify and hold the Owner, the Engineer and the Construction Manager harmless from and against any and all liability, loss, damage or expense arising from Contractor's failure to do so.

The Contractor shall use only areas specifically assigned by the Owner for parking, storage of materials and construction operations and shall comply with all local municipal regulations regarding use of and parking on public ways.

The Contractor shall repair any and all streets, drives, curbs, sidewalks, and landscaping which are disturbed by construction operations and shall leave them in as good condition after completion of the Work as they were in before commencement of the Work.

The Contractor shall not place or maintain, or allow to be placed or maintained, on or about the Project site any advertising matter, sign, bill, poster, or billboard of any kind, except those required by law or the Contract Documents, without the prior written consent of the Owner."

SC-6.12 Delete paragraph 6-12 of the General Conditions in its entirety and insert in its place the following:

"The Contractor shall maintain a record set of Contract Documents which shall record all deviations from the Drawings and Specifications and shall be updated in detail to reflect the actual progress of the Work. The Owner and the Engineer shall have free and complete access to such Contract Documents during the Work. Upon Substantial Completion, the Contractor shall furnish to the Owner through the Engineer one set of "as built" plans in such form as the Owner shall require. The Contractor shall also maintain a record set of the Specifications, Addenda, Change Orders and other Modifications in good order and marked and annotated currently to record changes made during the Work. Record documents in relation thereto shall be in compliance with M.G.L. Chapter 30, Section 39R."

SC-6.13 Delete paragraphs 6.13-B and 6.13-C of the General Conditions in their entirety.

- SC-6.19 In paragraph 6.19-A of the General Conditions insert at the beginning of the second sentence the words "Owner and".
- SC-6.20 Delete paragraph 6.20 of the General Conditions in its entirety and insert in its place the following:

"The Contractor shall compensate the Town of Natick for all damage to Town property of any nature arising out of the Contractor's work. To the fullest extent permitted by law, the Contractor shall indemnify, defend, and hold harmless the Town of Natick and all of its officers, employees, boards, commissions, committees, agents and representatives from and against all claims, causes of action, suits, costs, damages, and liability of any kind which arise out of the breach by the Contractor or its subcontractor(s) of their obligations under this Contract, or the act or omission of the Contractor, its subcontractor(s), or their officers, employees, agents and representatives or anyone directly or indirectly employed by them, or anyone for whose acts or omissions they may be liable, regarding the work to be performed by the Contractor under the Contract, or which arise out of the violation of any Federal, Massachusetts or Town of Natick statute, by-law, rule, regulation, order or directive, or which relate to personal injury or property damage suffered by the Contractor or any of its officers or employees regarding the subject matter of the Contract.

Neither the Town of Natick, nor any of its officers, employees, boards, committees, commissions, agents and representatives shall be under any personal obligation or shall incur any personal liability by reason of this Contract, the execution thereof or anything relating thereto which arises out of the violation of any provision of this Contract, or the violation of any Federal, Massachusetts or Town of Natick Law or Regulation, or which relates to personal injury or property damage suffered by the Contractor or its employees, regarding the subject matter of the Contract."

- SC-6.21 In paragraph 6.21-A of the General Conditions, delete the words "or unless such services are required to carry out contractor's responsibilities for construction means, methods, techniques, sequences and procedures"
- SC-6.22 Insert the following new paragraph 6.22 in the General Conditions:

#### "SC-6.22 Miscellaneous

6.22-A The Contractor shall give the Engineer timely notice of any additional Drawings, Specifications, or instructions required to define the Work in greater detail, or to permit the proper progress of the Work. The Contractor shall not proceed with any Work not clearly and consistently defined in the Contract Documents, but shall request additional drawings or instructions from the Engineer. If the Contractor proceeds with such Work without obtaining

further Drawings, Specifications or instructions, the Contractor shall correct Work incorrectly done at the Contractor's own expense. The Contractor shall give continuous attention to the faithful prosecution of the Work and shall keep the same under its personal control. It shall be responsible for all the acts and omissions of its employees, subcontractors, and of all persons directly or indirectly employed by it in connection with the prosecution of this Work.

6.22-B The Contractor may submit Requests For Information to the Engineer to help facilitate the Contractor's performance of the Contract. Prior to submitting each Request for Information, the Contractor shall first carefully study and compare the Contract Documents, field conditions, Owner-provided information, Contractor prepared Coordination Drawings, and prior Project correspondence and documentation to determine that the information to be requested is not reasonably obtainable from such sources.

Each Request for Information shall be submitted to the Engineer, in writing, on such form and with such accompanying information as the Engineer may require for such purpose. Each Request for Information shall identify the specific sources which were reviewed by the Contractor in its efforts to determine the information requested, and a statement to the effect that the information being requested could not be determined from such sources.

The Contractor shall submit each Request for Information sufficiently in advance of the date by which such information is required in order to allow the Engineer sufficient time, in the Engineer's professional judgment, to permit adequate review and response and to permit Contractor compliance with the latest Construction Schedule. The Contractor shall maintain a log at the Project site that sequentially numbers and lists each Request For Information. This log shall also contain the Drawing reference or Specification section to which the request pertains, the date of request, to whom the request was made, by whom the request was made, the nature of the request, and the Engineer's resolution thereof. This log shall be updated weekly by the Contractor and reviewed at each Project meeting, and the resolution of requests for information shall be made part of the minutes of such meetings.

The Contractor shall reimburse the Owner amounts charged to the Owner by the Engineer for responding to Contractor's Requests for Information where such information is available to the Contractor from a careful study and comparison of the Contract Documents, field conditions, other Owner provided information, Contractor prepared Coordination Drawings, or project correspondence or documentation.

6.22-C The Contractor shall be responsible to the Owner for the acts and omissions of all entities or persons performing or supplying the Work regardless of tier.

6.22-D The Contractor shall furnish sufficient forces, plant and equipment as may be necessary to insure the progress of the Work in accordance with the Project Schedule. If, in the opinion of the Owner, the Contractor has fallen behind the Project Schedule, the Contractor shall submit its bid demonstrating the manner in which the desired rate of progress may be increased and shall take such steps, at the Contractor's own cost, as may be necessary to meet the Project Schedule. It shall be the responsibility of the Contractor to maintain its schedule so as not to delay the progress of the Work or the scheduled work of separate Contractors.

6.22-E The Contractor shall be solely responsible for properly laying out the Work, and for all lines, elevations and measurements for all of the Work. It shall verify the figures shown on the Drawings before laying out the work and will be responsible for any error or inaccuracies resulting from its failure to do so. In the event that the Contractor shall, while laying out the Work, become aware of (i) any conflicts among or between the Drawings, the Specifications or any Modification to the Drawings or the Specifications and the actual layout of the Work, or (ii) any conflicts or inconsistencies in the Drawings and Specification themselves, it shall promptly notify the Engineer, without whose instructions the Contractor shall not adjust the matter except at his own risk.

6.22-F If this Project requires the containment, abatement or removal of asbestos or material containing asbestos, lead or waste containing lead-based paint, the Contractor shall ensure that the person or entity performing the asbestos or lead related services is licensed pursuant to applicable State laws and regulations.

6.22-G Chemical waste shall be stored in corrosion resistant containers, removed from the Project site, and disposed of not less frequently than every three weeks unless directed otherwise. Disposal of chemical waste shall be in accordance with requirements of the U.S. Environmental Protection Agency (EPA) and the Massachusetts Department of Environmental Protection (DEP). Fueling and lubricating of vehicles and equipment shall be conducted in a manner that affords the maximum protection against spills and evaporation. Lubricants to be discarded or burned shall be disposed of in accordance with approved procedures meeting all applicable Federal, State and Local regulations. In the event of an oil or hazardous materials spill large enough to violate Federal, State or Local regulations, the Contractor shall notify the Engineer immediately. The Contractor shall be responsible for immediately cleaning up any oil or hazardous waste spills resulting from its operations. Any costs incurred in cleaning up any such spills shall be borne exclusively by the Contractor.

The Contractor shall be solely responsible for compliance with laws and regulations governing the handling, storage, use or disposal of hazardous materials or wastes used, stored, generated or disposed of in connection with construction of the Work and shall obtain all permits and approvals, give all required notices, and observe all applicable procedures prescribed by the EPA,

DEP or other governmental authorities having jurisdiction with respect to such activities. At the Owner's request, the Contractor shall properly furnish the Owner with evidence satisfactory to the Owner demonstrating the Contractor's compliance with such procedures, the giving of such notices, and the issuance of such permits and approvals.

6.22-H The Contractor shall provide and maintain in good operating condition suitable and adequate fire protection equipment and services, and shall comply with all reasonable recommendations regarding fire protection made by the representatives of the fire insurance company carrying insurance on the Work or by the local fire chief or fire marshal. The area within the site limits shall be kept orderly and clean, and all combustible rubbish shall be promptly removed from the site.

6.22-I The Contractor shall at all times protect excavations, trenches, adjacent buildings and materials from rain water, ground water, backup or leakage of sewers, drains and other piping, and from water of any other origin, and shall remove promptly any accumulation of water. The Contractor shall provide and operate all pumps, piping and other equipment necessary to this end.

6.22-J The Contractor shall be responsible for all security measures necessary and appropriate to protect the Work area until acceptance by the Owner to assure that the Work, and all materials and equipment stored at the Site, are fully and completely protected against loss or damage due to vandalism, theft, or malicious mischief. The Contractor shall not use guard dogs for this purpose unless authorized in advance in writing by the Owner. If the Owner approves the use of guard dogs, each dog shall at all times be accompanied by an adult handler.

6.22-K The Contractor shall be responsible for the adequate strength and safety of all scaffolding, staging, and hoisting equipment and for temporary shoring, bracing, and tying.

6.22-L The Contractor shall furnish on site all personal protective equipment as required, approved first aid supplies, the name of its first-aid attendant, and a posted list of emergency facilities.

6.22-M No unauthorized visitors shall be allowed on the work site without permission from the Contractor.

6.22-N The Contractor shall employ labor subject to contract terms and conditions in order to ensure harmonious labor relations on the site and prevent strikes or labor disputes. The Contractor, in the event of a labor dispute including strikes, shall take whatever action is required at no expense to the Owner to prevent the disruption of the work. The Contractor shall also not permit employment of any person who is not of good character and morals nor permit disorderly or indecent conduct on the job site. He shall not permit the

consumption of alcoholic beverages or illegal drugs on the job site nor permit any employment or person under his supervision or control to be under the influence thereof."

#### 6.22-O (Statutory reference: M.G.L. c.149, §§30 and 34)

No laborer, worker, mechanic, foreman or inspector working within this Commonwealth in the employ of the Contractor, Subcontractor or other person doing or contracting to do the whole or part of the work contemplated by the Contract, shall be required or permitted to work more than eight hours in any one day or more than forty-eight (48) hours in any one week, or more than six (6) days in any one (1) week, except in cases of emergency.

#### 6.22-P (Statutory reference: M.G.L. c.149,§25)

Every employee under this Contract shall lodge, board and trade where and with whom he elects, and neither the Contractor nor his agents or employees shall, either directly or indirectly, require as a condition of the employment of any person that the employee shall lodge, board or trade at a particular place or with a particular person.

#### 6.22-Q (Statutory Reference: M.G.L. c.149,§34B) The Contractor shall pay to any reserve police officer employed by him in any city or town the prevailing rate of wage paid to regular police officers in such city or town."

6.22-R The Contractor is solely responsible for the proper and safe operation and maintenance of all utility systems within the construction limits, whether these are supplied by the Owner's distribution system or otherwise, until the work is accepted by the Owner, and until the Owner has notified the Contractor that other arrangements have been made. The Contractor shall maintain and operate appurtenances within the construction area which serve the distribution system, subject to periodic inspection by the Owner's operating personnel. Inspection by any representative or personnel of the Owner shall not relieve the Contractor of his responsibilities in connection with operation and maintenance of these facilities and equipment. The Contractor shall provide the Owner at least seventy-two (72) hours' advance notice of the Contractor's desire to extend, connect, disconnect, or turn on or off any steam, electric, water, or other service from the Owner's supply systems. The actual operation shall be witnessed and approved by an authorized representative of the Owner. All plumbing, heating, and electrical work, including installation of equipment, and other work to be performed by the Contractor, shall be carried out without interference with the Owner's normal operation. Where any work requires interruption of any service, the Contractor shall make advance arrangements with the Owner for dealing with and minimizing such interruption.

6.22-S The Contractor agrees to procure materials, equipment, labor and supplies from such sources and to perform all Work on the Project with labor,

material suppliers and Subcontractors that will work harmoniously with the Owner's employees, employees of other contractors employed by the Owner, and with other elements of labor involved in the construction of the Project or the operation of the building in which the Project is located, including, without limitation, any tenant improvement work contractors engaged by Owner or any tenants of Owner."

6.22-T Weather Protection Devices – Pursuant to M.G.L. Chapter149, Section 44G(D), the Contractor shall install weather protection devices and shall furnish adequate heat in the area so the work is protected during the months of November through March.

#### **ARTICLE 7 – OTHER WORK AT THE SITE**

SC-7.01 and	
SC-7.02 and	
SC-7.03	Delete paragraphs 7.01, 7.02 and 7.03 of the General Conditions in their entirety except for the first sentence in paragraph 7.01(A).

#### **ARTICLE 8 - OWNER'S RESPONSIBILITIES**

SC-8.06	In paragraph 8.02-A of the General Conditions, in the second and third lines, delete the words "to whom Contractor makes no reasonable objection".
SC-8.06	Delete paragraph 8.06-A of the General Conditions in its entirety.
SC-8.06	Delete paragraphs 8.10 and 8.11 of the General Conditions.
SC-8.09	Add the following at the end of paragraph 8.09 of the General Conditions:
	"The Contractor shall provide services under any Contract with the Owner as an independent contractor with the Town of Natick and not as an employee of the Town of Natick. No employee, agent or representative of the Contractor shall be entitled to receive any benefits of employment with the Town of Natick, including without limitation salary, overtime, vacation pay, holiday pay, sick leave, health insurance, life insurance, pension or deferred compensation."

#### **ARTICLE 9 – ENGINEER'S STATUS DURING CONSTRUCTION**

SC-9.01 Delete the first sentence of paragraph 9.01 of the General Conditions.

- SC-9.02 Add the words "and Owner" after the word "Engineer" in the third line of paragraph 9.02-A of the General Conditions. Substitute the word "deem" for "deems" in the same line. Delete the second and third sentences of said paragraph 9.02-A.
- SC-9.08-A Delete paragraph 9.08-A of the General Conditions.
- SC-9.09-A Insert the following language at the beginning of paragraph 9.09-A "To the extent permitted by law"

#### **ARTICLE 10 - CHANGES IN THE WORK: CLAIMS**

SC-10.01-A Delete Article 10 of the General Conditions in its entirety and insert in its place the following:

"SC-10.01 Change Orders

A Change Order may be submitted for changes in the Contract work, including but not limited to, changes in:

- a. the plans and specifications
- b. in the method or manner or performance of the work; and/or
- c. in the schedule for performance of the work.

Whenever a Change Order is requested or ordered, and said Change Order will cause an adjustment in the Contractor's cost, the Contractor may request an equitable adjustment in writing in the Contract price.

The Owner and the Contractor shall attempt to negotiate an equitable adjustment in the Contract price before commencement of the pertinent work. In the absence of a Contract for an equitable adjustment and when so directed, the Contractor shall proceed with the Change Order work on a time and material basis, and the Contractor will provide the Owner with a written notice to that effect.

Contractor shall provide the Owner with all cost and pricing data used in computing the amount of the equitable adjustment, and the Contractor shall certify that the pricing data used was accurate, complete, and current. With respect to any sum of money due to be paid by the Contractor to the Owner under the Contract, an appropriate Change Order shall be issued deducting said sum of money from payments then due or thereafter due to the Contractor from the Owner. If such deductions from payments then due or thereafter due to the Contractor from the Owner are not sufficient to cover such amounts, the Contractor shall pay the difference to the Owner.

#### SC-10.02 COMPUTING EQUITABLE ADJUSTMENTS

Equitable adjustments in the Contract price shall be determined according to one of the following methods, or a combination thereof, as determined by the Owner:

- a. fixed price basis, provided that the fixed price shall be inclusive of items (1) through (5) (below) and shall be computed in accordance with those provisions;
- b. estimated lump sum basis, to be adjusted in accordance with contract unit prices, or other agreed upon unit prices provided that the unit prices shall be inclusive of all costs related to such equitable adjustment;
- c. time and materials basis, on a not-to-exceed predetermined upset amount to be subsequently adjusted on the basis of actual costs based on the following items (1) through (5):
  - (1) the cost at minimum prevailing rates for direct labor, material, supplies and use of equipment exclusive of hand tools;
  - (2) plus cost of Workers' Compensation Insurance, union fringe benefits, federal unemployment taxes, Federal Social Security, and Massachusetts Unemployment Compensation, or, as an alternative the Contractor may elect to use a flat twenty (20%) percent of the total labor rate in item (1);
  - (3) plus fifteen (15%) percent of item (1) for overhead, superintendence, and profit, which will be paid to the Contractor for work performed by the Contractors' own trade forces (for work performed by a Subcontractor, the Subcontractor will be entitled to a fifteen (15%) percent mark-up and the Contractor to a five (5%) percent markup; for work performed by a Sub-subcontractor, the Subsubcontractor will be entitled to a fifteen (15%) percent mark-up, the Subcontractor to a five (5%) percent markup, and the Contractor to a five (5%) percent markup, and the Contractor to a five (5%) percent markup, and the Contractor to a five (5%) percent markup;
  - (4) if the net change is in addition to the contract price, it shall include the Contractor's overhead, superintendence, and profit. On any change which involves a net credit, no allowances for overhead, superintendence, and profit shall

be figured;

- (5) plus actual direct premium cost of payment and performance bonds required of the Contractor and its Subcontractors, provided there will be an appropriate credit for bond premiums in the case of a credit Change Order.
- d. If unit prices are stated in the Contract Documents or subsequently agreed upon, or if quantities originally contemplated are so changed in a proposed Change Order or Construction Change Directive that application of such unit prices to quantities of Work proposed will cause substantial inequity to the Owner or Contractor, the applicable unit prices shall be equitably adjusted.

#### SC-10.03 WORK PERFORMED UNDER PROTEST

The Contractor shall perform all work as directed by the Owner and if the Owner determines that certain work for which the Contractor has requested a Change Order does not represent a change in the Contract, or if the Contractor and Owner cannot agree to the amount of compensation for a Change Order, the Contractor shall perform said work under protest and shall follow the procedures described in the following subparagraphs a. and b.:

- a. If the Contractor claims compensation for a Change Order not approved by the Owner, the Contractor shall, on or before the first working day following commencement of any such work or sustaining of any such damage, submit to the Owner's representative a written statement of the nature of such work or damage sustained. The Contractor will not be entitled to compensation for any portion of its Change Order claim related to work performed prior to the Owner's receipt of the written statement referred to in the previous sentence.
- b. On or before the second (2nd) working day after the commencement of such work or sustaining of such damage, and daily thereafter, the Contractor shall file to the extent possible with the Engineer and the Owner itemized statements of the details and costs of such work performed or damage sustained; and unless such statements shall be made as so required, its claim for such compensation shall be forfeited and invalid and it shall not be entitled to payment on account of any such work or damage.
- c. The Owner shall have the right to reject Change Orders executed by the Contractor under a reservation of rights.

#### SC-10.04 COMPUTING TIME EXTENSIONS

Contract Time shall not be changed due to a delay in the Contractor's early completion date until all Contract Float is used and performance of the specified work necessarily extends beyond the Contract Time. An extension in Contract Time will not be approved unless the Contractor demonstrates through a detailed CPM schedule analysis that unforeseeable causes, beyond the control of and without the fault or negligence of both the Contractor and the Subcontractors or Suppliers at any tier, led to performance or completion of all or part of the work beyond the corresponding Contract Time despite the Contractor's reasonable and diligent actions. If granted, an extension in Contract Time shall be the Contractor's sole and exclusive remedy for any delay, disruption, interference, hindrance, and associated costs, however caused.

## SC-10.05 STATUTORY PROVISIONS – DIFFERING SITE CONDITIONS; TIMELY DECISIONS

The Contractor's attention is directed to M.G.L. c.30, Sections 39I, 39J, 39N, 39O, and 39P, the provisions of which apply to the Contract.

a. Differing Site Conditions, M.G.L. c.30, Section 39N.

> If, during the progress of the work, the Contractor or the Owner discovers that the actual subsurface or latent physical conditions encountered at the site differ substantially or materially from those shown on the plans or indicated in the Contract Documents either the Contractor or the Owner may request an equitable adjustment in the Contract price applying to work affected by the differing site conditions. A request for such an adjustment shall be in writing and shall be delivered by the party making such claim to the other party as soon as possible after such conditions as discovered. Upon receipt of such a claim from a Contractor, or upon its own initiative, the Owner shall make an investigation of such physical conditions, and, if they differ substantially or materially from those shown on the plans or indicated in the Contract Documents or from those ordinarily encountered and generally recognized as inherent in work of the character provided for in the plans and Contract Documents and are of such nature as to cause an increase or decrease in the cost of performance of the Work or a change in the construction methods required for the performance of the Work which results in an increase or decrease in the cost of the work, the Owner shall upon submission by the Contractor of a properly submitted change order request, make an equitable adjustment in the Contract price and the Contract shall

be modified in writing accordingly.

b. Timely decision by the Owner. M.G.L. c.30, Section 39P.

Whenever the Contract requires the Owner or the Engineer to make a decision during construction of the Project on interpretation of the specifications, approval of equipment, material, or any other approval, or progress of the work, that decision shall be made promptly and, in the event, no later than thirty (30) days after receipt of a written submission for such decision by the Contractor, but if such decision requires extended investigation and study, the Owner or the Engineer shall, within thirty (30) days after the receipt of the submission, give the Contractor written notice of the reasons why the decision cannot be made within the thirty (30) day period and the date by which the decision will be made."

#### SC-10.06 CERTIFICATE OF APPROPRIATION

(Statutory reference: M.G.L. c.44 §31C)

The contract shall not be deemed to have been made until the auditor or accountant or other officer of the city or town having similar duties has certified thereon that an appropriation in the amount of the contract is available therefor and that an officer or agent of the city, town, or Awarding Authority has been authorized to execute said contract and approve all requisitions and change orders. No order to the Contractor for a change in or addition to the work, whether in the form of a drawing, plan, detail or any other written instruction, unless it is an order which the Contractor is willing to perform without any increase in the contract price, shall be deemed to be given until the auditor or accountant, or other officer of the Awarding Authority having similar duties, has certified thereon that an appropriation in the amount of such order is available therefore; but such certificate shall not be construed as an admission by the Awarding Authority of its liability to pay for such work. The certificate of the auditor or accountant or other officer of the Awarding Authority having similar duties that an appropriation in the amount of the contract or in the amount of such order is available shall bar any defense by the Awarding Authority on the grounds of insufficient appropriation."

#### ARTICLE 11- COST OF THE WORK; ALLOWANCES; UNIT PRICE WORK

SC-11.01-A In paragraph 11.01-A of the General Conditions, in the last sentence, delete the word "and", in the second last line, and insert at the end of the last sentence the following text ", and shall include no markup".

- SC-11.01-A In paragraph 11.01-A.1 of the General Conditions, in the last line, insert "in advance, in writing," between the words "authorized" and "by".
- SC 11.01-A Add the following paragraph at the end of paragraph 11.01-A.2 of the General Conditions:

"11.01-A.2.a. Only those materials required as a result of such Work and reasonable freight charges for delivery of same are allowable. Only the equipment and machinery required as a result of such Work is allowable. Costs for equipment and machinery shall be based upon the current Nielson/Dataquest <u>Rental Bluebook for Construction Equipment</u> (the "Bluebook"). In determining the rental rate the following shall apply:

- a. For equipment already on the project the monthly prorated rental rate by the hourly use shall be applicable;
- b. For equipment not on the project the daily rate, the weekly rate, or monthly rate will prevail, whichever will prove to be most cost effective. Small tools and manual equipment are examples of costs not allowable under this item. These costs are considered to be included in the Contractor's Fee as detailed in paragraphs 11.6 of the General Conditions.

(1 month (normal use) = 176 hours) (See 11.01-A.5.c. for equipment and machinery actually rented)."

Amend paragraph 11.01-A.5.a. of the General Conditions by adding the following language at the end of the paragraph:

", provided that the Contractor shall substantiate that this reimbursement payment is customarily considered normal to his operations." Delete paragraph 11.01-A.5.c. of the General Conditions in its entirety and insert the following language in its place:

"11.01-A.5.c. All construction equipment and machinery and the parts thereof actually rented from others in accordance with rental agreements approved in advance, in writing, by Owner with the advice of Engineer, and the costs of transportation, loading, unloading, installation, dismantling and removal thereof all in accordance with terms of said rental agreements. The rental of any such equipment, machinery or parts shall cease when the use thereof is no longer necessary for the Work."

Amend the first sentence of paragraph 11.01-A.5.f. of the General Conditions by striking out the following words:

"(except losses and damages within the deductible amounts of property insurance established by Owner in accordance with paragraph 5.06.D)."

and by deleting in the ninth line the word "negligence" and inserting in its place the words "act or omission".

Delete paragraph 11.01-A.5.h. of the General Conditions in its entirety.

- SC-11.01-B In paragraph 11.01-B.4 of the General Conditions, in the first line, insert "or willful misconduct" between the words "negligence" and "of".
- SC-11.01-D In paragraph 11.01-D of the General Conditions, in the first paragraph, third line, delete the word "will" and insert in its place the word "shall".
- SC-11.01-D Add the following paragraphs after paragraph 11.01-D of the General Conditions: "11.01-D.1. Executed change orders shall be submitted to Owner in triplicate on the Change Order Form included in Part II of the Supplementary Conditions, and to the format of the Example Calculation Sheet also located in Part II of the Supplementary Conditions.

11.01-D.2. The Contractor shall include three (3) copies of invoices to substantiate all costs for materials and equipment directly associated with work involved in the change order.

11.01-D.3. The Contractor shall include three (3) copies of labor summary to include name, classification, wage and date for all personnel directly involved in the work associated with the change order."

#### ARTICLE 12 – CHANGE OF CONTRACT PRICE: CHANGE OF CONTRACT TIMES

- SC-12.01 In paragraph 12.01-A of the General Conditions, last line, delete "10.05" and insert in its place "10.03".
- SC-12.01 Delete paragraphs 12.01-C.2.a, through 12.01-C.2.c. of the General Conditions.
- SC-12.01-C Paragraphs 12.01-C.2.d. through 12.01-C.2.f. of the General Conditions shall be renumbered 12.-1-C.2.a. through 12-1-C.2.c., respectively.
- SC-12.01-C New paragraph 12.-1-C.2.a of the General Conditions (former paragraph 12.01-C-2.d.) shall read"

"No fee shall be paid on the basis of costs."

SC-12.02 Delete paragraph 12.02-B of the General Conditions in its entirety and insert in its place the following:

#### "SC-12.02 TIME

#### 12.02-B TIME IS OF THE ESSENCE

Time is of the essence in the performance of the Contract. By executing the Contract, the Contractor represents that the time for performance stated in the Contract documents is a reasonable period for completing the Work to be performed under the Contract.

The Contractor shall prosecute the work with the diligence necessary to ensure its completion within the required time. The Contractor shall provide sufficient labor, materials, and equipment, and shall promptly take such appropriate action to recover schedule as may be necessary. The Contractor shall carry on the work and adhere to the schedule during all disputes and disagreements with the Owner. No work shall be delayed or postponed pending resolution of any disputes and disagreements. The Contractor shall exercise reasonable precautions, efforts, and measures to avoid or mitigate situations which would cause delays.

If no specific date is identified in the Contract Documents for Final Completion of the Project or a particular phase of the Project, Final Completion of the Project or Project phase shall be achieved by the Contractor within thirty (30) calendar days after the date of Substantial Completion of the Project or Project phase."

12.02-C At least ten (10) working days before the first Application for Payment, the Contractor shall submit to the Engineer a Progress Schedule showing for each class of work included in the Schedule of Values, the percentage completion to be obtained and the total dollar value of work to be completed as of the first of each month until Substantial Completion. All calculations shall be on the basis of work in place, but not including the value of materials delivered but not in place.

12.02-D The Progress Schedule shall be based on an orderly progression of the Work, allowing adequate time for each operation (including adequate time for submission and review of submittals), and leading to a reasonable certainty of Substantial Completion by the date established in the Contract. The Progress Schedule will be reviewed by the Engineer for compliance with the requirements of this Article and will be accepted by the Engineer or returned to the Contractor for revision and resubmittal. Unless specifically required by law, no payment under this Contract shall be due until the Progress Schedule has been approved by the Engineer. The Engineer's review of the Progress Schedule shall not impose any duty on the Engineer or the Owner with respect to the timing, planning, scheduling, or execution of the Work. In particular, if the Contractor proposes a Progress Schedule indicating a date of Substantial Completion which

is earlier than the Contract Time, the Contractor shall not be entitled to additional payment or compensation of any kind if, for any reason, the full Contract Time is required to achieve Substantial Completion of the Work.

12.02-E If in any Application for Payment the total value of the completed Work in place, as certified by the Engineer, is less than ninety (90%) percent of the total value of the Work in place estimated in the Progress Schedule, the Owner shall have the right, at the Owner's option and without cost to the Owner, to order the Contractor to take corrective measures necessary to expedite the progress of construction, including without limitations: (i) working additional shifts or overtime, (ii) supplying additional workers, equipment, and facilities, and (iii) other similar measures (hereinafter referred to as "Extraordinary Measures"). The Owner's right to require Extraordinary Measures is solely for the purpose of ensuring the Contractor's compliance with the construction schedule.

12.02-F If each of three successive applications for payment, as certified by the Engineer, indicate that the actual Work completed is less than ninety (90%) percent of the values estimated in the Progress Schedule to be completed by the respective dates, the Owner may at the Owner's option, treat the Contractor's delinquency as a default.

12.02-G If the Engineer has determined that the Contractor should be permitted to extend the time for completion, the calendar dates in the Progress Schedule shall be adjusted accordingly to retain their same relationship to the adjusted date of Substantial Completion, and the dollar value of Work to be completed as of the first of each month shall be adjusted prorata.

12.02-H If the Contractor fails to submit any Application for Payment in any month, the Engineer shall, for the purpose of this evaluation of progress, certify separately to the actual value of the Work in place completed as of the first of the month to the best of the Engineer's knowledge.

12.02-I The Owner and the Contractor shall comply with M.G.L. c.30, §39K, to the extent applicable, which provides:

Within fifteen (15) days (thirty (30) days in the case of the commonwealth, including local housing authorities) after receipt from the contractor, at the place designated by the awarding authority if such a place is so designated, of a periodic estimate requesting payment of the amount due for the preceding month, the awarding authority will make a periodic payment to the contractor for the work performed during the preceding month and for the materials not incorporated in the work but delivered and suitably stored at the site (or at some location agreed upon in writing) to which the contractor has title or to which a subcontractor has title and has authorized the contractor to transfer title to the

awarding authority, upon certification by the contractor that he is the lawful owner and that the materials are free from all encumbrances, but less (1) a retention based on its estimate of the fair value of its claims against the contractor and less (2) a retention for direct payments to subcontractors based on demands for same in accordance with the provisions of section thirty-nine F, and less (3) a retention not exceeding five per cent of the approved amount of the periodic payment. After the receipt of a periodic estimate requesting final payment and within sixty-five days after (a) the contractor fully completes the work or substantially completes the work so that the value of the work remaining to be done is, in the estimate of the awarding authority, less than one per cent of the original contract price, or (b) the contractor substantially completes the work and the awarding authority takes possession for occupancy, whichever occurs first, the awarding authority shall pay the contractor the entire balance due on the contract less (1) a retention based on its estimate of the fair value of its claims against the contractor and of the cost of completing the incomplete and unsatisfactory items of work and less (2) a retention for direct payments to subcontractors based on demands for same in accordance with the provisions of section thirty-nine F, or based on the record of payments by the contractor to the subcontractors under this contract if such record of payment indicates that the contractor has not paid subcontractors as provided in section thirty-nine F. If the awarding authority fails to make payment as herein provided, there shall be added to each such payment daily interest at the rate of three percentage points above the rediscount rate than charged by the Federal Reserve Bank of Boston commencing on the first day after said payment is due and continuing until the payment is delivered or mailed to the contractor; provided, that no interest shall be due, in any event, on the amount due on a periodic estimate for final payment until fifteen days (twenty-four days in the case of the commonwealth) after receipt of such a periodic estimate from the contractor, at the place designated by the awarding authority if such a place is so designated. The contractor agrees to pay to each subcontractor a portion of any such interest paid in accordance with the amount due each subcontractor.

The awarding authority may make changes in any periodic estimate submitted by the contractor and the payment due on said periodic estimate shall be computed in accordance with the changes so made, but such changes or any requirement for a corrected periodic estimate shall not affect the due date for the periodic payment or the date for the commencement of interest charges on the amount of the periodic payment computed in accordance with the changes made, as provided herein; provided, that the awarding authority may, within seven days after receipt, return to the contractor for correction, any periodic estimate which is not in the required form or which contains computations not arithmetically correct and, in that event, the date of receipt of such periodic estimate shall be the date of receipt of the corrected periodic estimate in proper form and with arithmetically correct computations. The date of receipt of a periodic estimate received on a Saturday shall be the first working day thereafter. The provisions of section thirty-nine G shall not apply to any contract for the construction, reconstruction, alteration, remodeling, repair or demolition of any public building to which this section applies.

All periodic estimates shall be submitted to the awarding authority, or to its designee as set forth in writing to the contractor, and the date of receipt by the awarding authority or its designee shall be marked on the estimate. All periodic estimates shall contain a separate item for each filed subtrade and each sub-subtrade listed in sub-bid form as required by specifications and a column listing the amount paid to each subcontractor and sub-subcontractor as of the date the periodic estimate is filed. The person making payment for the awarding authority shall add the daily interest provided for herein to each payment for each day beyond the due date based on the date of receipt marked on the estimate.

A certificate of the architect to the effect that the contractor has fully or substantially completed the work shall, subject to the provisions of section thirtynine J, be conclusive for the purposes of this section.

Notwithstanding the provisions of this section, at any time after the value of the work remaining to be done is, in the estimation of the awarding authority, less than 1 per cent of the adjusted contract price, or the awarding authority has determined that the contractor has substantially completed the work and the awarding authority has taken possession for occupancy, the awarding authority may send to the general contractor by certified mail, return receipt requested, a complete and final list of all incomplete and unsatisfactory work items, including, for each item on the list, a good faith estimate of the fair and reasonable cost of completing such item. The general contractor shall then complete all such work items within 30 days of receipt of such list or before the contract completion date, whichever is later. If the general contractor fails to complete all incomplete and unsatisfactory work items within 45 days after receipt of such items furnished by the awarding authority or before the contract completion date, whichever is later, subsequent to an additional 14 days' written notice to the general contractor by certified mail, return receipt requested, the awarding authority may terminate the contract and complete the incomplete and unsatisfactory work items and charge the cost of same to the general contractor and such termination shall be without prejudice to any other rights or remedies the awarding authority may have under the contract. The awarding authority shall note any such termination in the evaluation form to be filed by the awarding authority pursuant to the provisions of section 44D of chapter 149.

12.02-J Nothing herein shall limit the Owner's right to liquidated or other damages for delays by the Contractor or to any other remedy which the Owner may possess under other provisions of the Contract Documents or by law.

12.02-K Should the Contractor request additional time to complete the work, it shall document its reasons therefor and request an extension of time the alleged delay occurred. Failure to notify the Owner of any delay as provided in this

Article shall preclude the Contractor from subsequently claiming any time extension or other relief due to said delay. Request for extensions of time shall be submitted as a Change Order request to the Owner.

The Contractor shall submit the amount of a claim to the Owner in writing as soon as practicable after the end of the suspension, delay, interruption, or failure to act and, in any event, not later than the date of final payment under the Contract and, except for costs due to a suspension order, the Owner shall not approve any costs in the claim incurred more than twenty (20) days before the Contractor notified the Owner in writing of the act or failure to act involved in the claim.

The Owner and the Contractor agree that they understand that this subparagraph places a burden on the Contractor to inform the Owner, as soon as practicable, whenever the Contractor considers that an action or inaction of the Owner or the Engineer could result or has resulted in a delay in the Project, thereby providing the Owner and the Engineer with the opportunity to take action to avoid or lessen the time extensions or damages that might be associated with such action or inaction.

The Contractor and the Surety on the Contractor's performance bond shall be jointly and severally liable for, and shall pay to the Owner the expenses for inspection of Work performed after the time stipulated in the Owner-Contractor Contract for Substantial Completion. Such inspection costs shall include fees paid to the Engineer and its consultants as extra services at the rate stipulated in the Owner-Engineer Contract, the costs of any other project representatives of the Owner at the current salary rate and any other direct expenses due to inspection. The Owner may retain from monies otherwise due the Contractor whatever sums accrue to the Owner pursuant to this provision. The Contractor shall not be liable for inspection costs for delay in performance as provided hereunder for any period for which an extension of the Contract Time has been granted.

12.02-L No claim for extension of time shall be allowed on account of failure of the Engineer to furnish Drawings, Specifications or instructions until fifteen (15) days after receipt by the Engineer by registered or certified mail, or by hand delivery acknowledged by the Engineer, of written demand for such instructions, Drawings, or Samples, and not then unless such claim be reasonable.

No extension of time shall be granted because of seasonal or abnormal variations in temperature, humidity or precipitation, which conditions shall be wholly at the risk of the Contractor, whether occurring within the time originally scheduled for completion or within the period of any extension granted. There shall be no increase in the Contract Sum on account of any additional costs of operations or conditions resulting therefrom.

The Contractor hereby agrees that the Contractor shall have no claim for

damages of any kind against the Owner or the Engineer on account of any delay in the commencement of the Work and/or any hindrance, delay or suspension of any portion of the Work, whether such delay is caused by the Owner, the Engineer, or otherwise, except as and to the extent expressly provided under M.G.L. c.30, §390 in the case of written orders by the Owner. The Contractor acknowledges that the Contractor's sole remedy for any such delay and/or suspension will be an extension of time as provided in this Article.

12.02-M (Statutory reference: M.G.L. c.30 §39O)

- The Awarding Authority may order the Contractor in writing to a. suspend, delay, or interrupt all or any part of the work for such period of time as it may determine to be appropriate for the convenience of the Awarding Authority; provided, however, that if there is a suspension, delay or interruption for fifteen days or more or due to a failure of the Awarding Authority to act within the time specified in this contract, the Awarding Authority shall make an adjustment in the contract price for any increase in the cost of performance of this contract but shall not include any profit to the Contractor on such increase; and provided further, that the Awarding Authority shall not make any adjustment in the contract price under this provision for any suspension, delay, interruption or failure to act to the extent that such is due to any cause for which this contract provides for an equitable adjustment of the contract price under any other contract provisions.
- b. The Contractor shall submit the amount of a claim under provision (a) to the Awarding Authority in writing as soon as practicable after the end of the suspension, delay, interruption or failure to act and, in any event, not later than the date of final payment under this contract and, except for costs due to a suspension order, the Awarding Authority shall not approve any costs in the claim incurred more than twenty (20) days before the Contractor notified the Awarding Authority in writing of the act or failure to act involved in the claim.

In the event a suspension, delay, interruption or failure to act of the Awarding Authority increases the cost of performance to any Subcontractor, that Subcontractor shall have the same rights against the Contractor for payment for an increase in the cost of his performance as provisions a. and b. give the Contractor against the Awarding Authority, but nothing in provisions a. and b. shall in any way change, modify or alter any other rights which the Contractor or the Subcontractor may have against each other.

#### 12.02-N LIQUIDATED DAMAGES

If the Contractor shall fail to achieve Substantial Completion within the Contract Time, it shall be liable to pay the Owner the daily amount as stipulated in the Contract not as a penalty, but as fixed and agreed upon damages for breach of contract. The said amount is fixed and agreed upon because of the difficulty of ascertaining the Owner's actual damages. It is mutually understood that the said amount is a reasonable approximation or estimate thereof as of the date of the Contract. The said amount may be withheld from periodic or final payments due to the Contractor, in addition to retainage and other backcharges."

- SC-12.03 In paragraph 12.03-A of the General Conditions, in the eighth line, insert "acts or neglect by Engineer," after "acts or neglect by Owner".
- SC-12.03 In paragraph 12.03-C of the General Conditions, in the fifth line, insert "and Engineer" between "Owner" and "and".

## ARTICLE 13 - TESTS AND INSPECTIONS; CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK:

- SC-13.03 Delete paragraph 13.03-B of the General Conditions in its entirety.
- SC-13.07 In paragraph 13.07-B of the General Conditions, in the last line, delete "will" and insert in its place "shall".
- SC-13.09 Add the following paragraph immediately after paragraph 13.09-D of the General Conditions:

"13.09-E In the event of an emergency caused by defective Work, if the Contractor fails to respond to notification within twelve (12) hours, the Owner may proceed with alleviating the condition, and at his option may impose a surcharge upon the Contractor or a decrease in the Contract Price to cover associated costs in relation thereto."

#### **ARTICLE 14 - PAYMENTS TO CONTRACTOR AND COMPLETION**

SC-14.02 Delete paragraph 14.02 A, B and C of the General Conditions in their entirety and insert in its place the following:

"M.G.L. c.30, § 39K is incorporated herein by reference. See Part II of the SUPPLEMENTARY CONDITIONS, p. 00810-7."

SC-14.03-A Add a new paragraph immediately after paragraph 14.03-A of the General Conditions:

"14.03-A.1. No materials or supplies for the Work shall be purchased by Contractor or Subcontractor subject to any chattel mortgage or under a conditional sale contract or other agreement by which an interest is retained by the seller. Contractor shall warrant that he has clear title to all materials and supplies used by him in the Work, free from all liens, claims or encumbrances."

SC-14.04 Delete paragraphs 14.04-A through 14.04-D of the General Conditions in their entirety and insert in their place the following:

"14.04-A Substantial completion and payment in relation thereto shall be in compliance with M.G.L. Chapter 30, Section 39G for Utility Contracts, and M.G.L. Chapter 30, Section 39K for Building Associated Contracts, as included in Part II of the Supplementary Conditions.

14.04-A.1. For utility contracts, Owner, within twenty-one (21) days of receipt of certification from Contractor that the work has been Substantially Complete, shall present to Contractor a written declaration that work has been Substantially Complete, or an itemized list of incomplete or unsatisfactory work items.

14.04-A.1.a. Within sixty-five (65) days after the effective date of Substantial Completion and receipt of an Application for Payment, Owner shall submit to Contractor payment for the quantity and price of the work done with the following deductions:

- a. A retainer of one (1%) percent of the undisputed Substantial Completion payment amount.
- b. Less the estimated cost of completing all incomplete and unsatisfactory work items.
- c. An amount equal to sum of all demands for direct payment filed by subcontractors and not yet paid to subcontractors or deposited in a joint account."
- SC-14.07-14.09 Delete paragraphs 14.07 through 14.09 of the General Conditions and insert in their place the following:

"(Statutory Reference – M.G.L. c.30, §39F:

Forthwith after the Contractor receives payment on account of a periodic estimate, the Contractor shall pay to each Subcontractor the amount paid for the labor performed and the materials furnished by that Subcontractor, less any amount specified in any court proceedings barring such payment and also less any amount claimed due from the Subcontractor by the Contractor. Not later than the sixty-fifth (65th) day after each Subcontractor substantially completes his work in accordance with the plans and specifications, the entire balance due under the subcontract, less amounts retained by the Awarding Authority as the estimated cost of completing the incomplete and unsatisfactory items of work, shall be due the Subcontractor; and the Awarding Authority shall pay that amount to the Contractor. The Contractor shall forthwith pay to the Subcontractor the full amount received from the Awarding Authority less any amount specified in any court proceedings barring such payment and also less any amount claimed due from the Subcontractor by the Contractor.

Each payment made by the Awarding Authority to the Contractor for the labor performed and the materials furnished by a Subcontractor shall be made to the Contractor for the account of that Subcontractor; and the Awarding Authority shall take reasonable steps to compel the Contractor to make each such payment to each such Subcontractor. If the Awarding Authority has received a demand for direct payment from a Subcontractor for any amount which has already been included in a payment to the Contractor or which is to be included in a payment to the Contractor for payment to the Subcontractor, the Awarding Authority shall act upon the demand as provided herein.

If, within seventy (70) days after the Subcontractor has substantially completed the subcontract work, the Subcontractor has not received from the Contractor the balance due under the subcontract including any amount due for extra labor and materials furnished to the Contractor, less any amount retained by the Awarding Authority as the estimated cost of completing the incomplete and unsatisfactory items of work, the Subcontractor may demand direct payment of that balance from the Awarding Authority. The demand shall be by a sworn statement delivered to or sent by certified mail to the Awarding Authority, and a copy shall be delivered to or sent by certified mail to the Contractor at the same time. The demand shall contain a detailed breakdown of the balance due under the subcontract and also a statement of the status of completion of the subcontract work. Any demand made after substantial completion of the subcontract work shall be valid even if delivered or mailed prior to the seventieth (70th) day after the Subcontractor has substantially completed the subcontract work. Within ten (10) days after the Subcontractor has delivered or so mailed the demand to the Awarding Authority and delivered or so mailed a copy to the Contractor, the Contractor may reply to the demand. The reply shall be by a sworn statement delivered to or sent by certified mail to the Awarding Authority, and a copy shall be delivered to or sent by certified mail to the Subcontractor at the same time. The reply shall contain a detailed breakdown of the balance due under the subcontract, including any amount due for extra labor and materials furnished to the Contractor and of the amount due for each claim made by the Contractor against the Subcontractor.

Within fifteen (15) days after receipt of the demand by the Awarding Authority, but in no event prior to the seventieth (70th) day after substantial completion of the subcontract work, the Awarding Authority shall make direct payment to the Subcontractor of the balance due under the subcontract, including any amount

due for extra labor and materials furnished to the Contractor, less any amount (i) retained by the Awarding Authority as the estimated cost of completing the incomplete or unsatisfactory items of work, (ii) specified in any court proceedings barring such payment, or (iii) disputed by the Contractor in the sworn reply; provided that the Awarding Authority shall not deduct from a direct payment any amount as provided in part (iii) if the reply is not sworn to, or for which the sworn reply does not contain the detailed breakdown required by M.G.L. c 30, §39F. The Awarding Authority shall make further direct payments to the Subcontractor forthwith after the removal of the basis for deductions from direct payments made.

The Awarding Authority shall forthwith deposit the amount deducted from a direct payment in an interest-bearing joint account in the names of the Contractor and the Subcontractor in a bank in Massachusetts selected by the Awarding Authority or agreed upon by the Contractor and the Subcontractor and shall notify the Contractor and the Subcontractor of the date of the deposit and the bank receiving the deposit. The bank shall pay the amount in the account, including accrued interest, as provided in a Contract between the Contractor and the Subcontractor or as determined by decree of a court of competent jurisdiction.

All direct payments and all deductions from demands for direct payments deposited in an interest-bearing account or accounts in a bank pursuant to the provisions herein shall be made out of amounts payable to the Contractor at the time of receipt of a demand for direct payment from a Subcontractor and out of amounts which later become payable to the Contractor and in the order of receipt of such demands from Subcontractors. All direct payments shall discharge the obligation of the Awarding Authority to the Contractor to the extent of such payment.

The Awarding Authority shall deduct from payments to a Contractor amounts which, together with the deposits in interest-bearing accounts, are sufficient to satisfy all unpaid balances of demands for direct payment received from Subcontractors. All such amounts shall be earmarked for such direct payments, and the Subcontractors shall have a right in such deductions prior to any claims against such amounts by creditors of the Contractor.

If the Subcontractor does not receive payment as provided herein or if the Contractor does not submit a periodic estimate for the value of the labor or materials performed or furnished by the Subcontractor and the Subcontractor does not receive payment for same when due less the deductions provided for herein, the Subcontractor may demand direct payment by following the procedure provided for in M.G.L. c.30, §39F, and the Contractor may file a sworn reply as provided in that same Sub-subparagraph. A demand made after the first day of the month following that for which the Subcontractor performed or furnished the labor and materials for which the Subcontractor seeks payment

shall be valid even if delivered or mailed prior to the time payment was due on a periodic estimate from the Contractor. Thereafter the Awarding Authority shall proceed as provided in M.G.L. c.30, §39F.

Any assignment by a Subcontractor of the rights under this section to a surety company furnishing a bond under the provisions of M.G.L. c.149, §29 shall be invalid. The assignment and subrogation rights of the surety to amounts included in a demand for direct payment which are in the possession of the Awarding Authority or which are on deposit pursuant to the provisions herein shall be subordinate to the rights of all Subcontractors who are entitled to be paid under this section and who have not been paid in full.

(3) "Subcontractor" as used in this section (i) for contracts awarded as provided in sections forty-four A to forty-four H, inclusive, of chapter one hundred fortynine shall mean a person who files a sub-bid and receives a subcontract as a result of that filed sub-bid or who is approved by the awarding authority in writing as a person performing labor or both performing labor and furnishing materials pursuant to a contract with the general contractor

A Contractor or a Subcontractor shall enforce a claim to any portion of the amount of a demand for direct payment deposited pursuant to M.G.L. c.30, §39F by a petition in equity in the superior court against the other and the bank shall not be a necessary party. A Subcontractor shall enforce a claim for direct payment or a right to require a deposit by a petition in equity in the superior court against the Awarding Authority and the Contractor shall not be a necessary party. Upon motion of any party the court shall advance for speedy trial any petition filed as provided in this paragraph. M.G.L. c.231, §§59 and 59B shall apply to such petitions. The court shall enter an interlocutory decree upon which execution shall issue for any part of a claim found due pursuant to §§59 and 59B and, upon motion of any party, shall advance for speedy trial the petition to collect the remainder of the claim. Any party aggrieved by such interlocutory decree shall have the right to appeal therefrom as from a final decree. The court shall not consolidate for trial the petition of any Subcontractor with the petition of one or more Subcontractors of the same general contract unless the court finds that a substantial portion of the evidence of the same events during the course of construction (other than the fact that the claims sought to be consolidated arise under the same general contract) is applicable to the petitions sought to be consolidated and that such consolidation will prevent unnecessary duplication of evidence. A decree in any such proceeding shall not include interest on the disputed amount deposited in excess of the interest earned for the period of any such deposit. No person except a Subcontractor filing a demand for direct payment for which no funds due the Contractor are available for direct payment shall have a right to file a petition in a court of equity against the Awarding Authority claiming a demand for direct payment is premature, and such Subcontractor must file the petition before the Awarding Authority has made a direct payment to the Subcontractor and has made a deposit of the disputed

portion.

In any petition to collect any claim for which a Subcontractor has filed a demand for direct payment the court shall, upon motion of the Contractor, reduce by the amount of any deposit of a disputed amount by the Awarding Authority as provided herein any amount held under a trustee writ or pursuant to a restraining order or injunction."

#### **ARTICLE 15 - SUSPENSION OF WORK AND TERMINATION**

SC-15.01 Delete paragraph 15.01 A of the General Conditions in its entirety and insert in its place the following:

"15.01-A The Owner may order the Contractor in writing to suspend, delay, or interrupt all or any part of the Work for such period of time as it may determine to be appropriate for the convenience of the Owner; provided however, that if there is a suspension, delay or interruption for fifteen (15) days or more or due to a failure of the Owner to act within the time specified in this Contract, the Owner shall make an adjustment in the Contract Price for any increase in the cost of performance of this Contract but shall not include any profit to the Contractor on such increase; and provided further, that the Owner shall not make any adjustment in the Contract Price under this provision for any suspension, delay, interruption or failure to act to the extent that such is due to any cause for which this Contract provides for an equitable adjustment of the Contract Price under any other Contract provisions.

The Contractor shall submit the amount of said claim to the Owner in writing as soon as practicable after the end of the suspension, delay, interruption or failure to act and, in any event, not later than the date of final payment under this Contract and, except for costs due to a suspension order, the Owner shall not approve any costs in the claim incurred more than twenty (20) days before the Contractor notified the Owner in writing of act or failure to act involved in the claim.

15.01-A-1. The above revisions contained in paragraph under SC-15.01 are in compliance with Massachusetts General Laws Chapter 30, Section 39O."

SC-15.02

Delete paragraph 15.02 A, B, C, D, E and F of the General Conditions in their entirety and insert in its place the follow provision:

"15.02-A If the Contractor persistently or repeatedly refuses or fails, except in cases for which extension of time is provided, to supply enough properly skilled workmen or proper materials, or if the Contractor fails to make prompt payment to Subcontractors or for materials or labor, or persistently disregards laws, ordinances, rules, regulations or orders of any public authority having jurisdiction or disregards an instruction, order or decision of the Engineer, or otherwise is guilty of a substantial violation of any provision of the Contract, then the Contractor shall be in default, and the Owner may, without prejudice to any other right or remedy and upon written notice to the Contractor of such default, take possession of all materials, tools, appliances, equipment, construction equipment and machinery and vehicles, offices and other facilities on the Project site, and all materials intended for the Work, wherever stored, and, if such default is not cured within seven (7) days after such notice, may terminate the employment of the Contractor, accept assignment of any or all subcontracts, and finish the Work by whatever method the Owner may deem expedient. The Owner shall be entitled to collect from the Contractor all direct, indirect, and consequential damages suffered by the Owner on account of the Contractor's default, including without limitation additional services and expenses of the Engineer made necessary thereby. The Owner shall be entitled to hold all amounts due the Contractor at the date of termination until all of the Owner's damages have been established, and to apply such amounts to such damages.

If, after final completion of the Work, the Owner determines that the unpaid amount (if any) due to the Contractor for the portion of the Work performed by the Contractor in accordance with the Contract exceeds any costs and damages incurred by the Owner as the result of the Contractor's breach of this Contract, such excess shall be paid to the Contractor. If the costs and damages incurred by the Owner as the result of the Contractor's breach of this Contract exceeds the unpaid amount (if any) due to the Contractor for the portion of the Work performed by the Contractor, the Contractor shall promptly pay such excess upon written demand by the Owner. In the event of a termination of the Contract pursuant to this Article, the Owner and the Contractor shall forthwith return to the other all papers, materials and other properties of the other held by each for the purposes of execution of the Contract. In addition, each party will make reasonable efforts to assist the other party in an orderly termination of this Contract." 15.02-B If the Contractor is determined by a court of competent jurisdiction to be bankrupt, or if any assignment shall be made by the Contractor or by any guarantor of the Contractor for the benefit of creditors, or if a petition is filed by the Contractor or by guarantor of the Contractor for adjudication as a bankrupt, or for reorganization or an arrangement under any provision of the Bankruptcy Act as then in force and effect, or in an involuntary petition under any of the provisions of the Bankruptcy Act is filed against the Contractor and such involuntary petition is not discharged within ninety (90) days thereafter, in any event the Owner may terminate this Contract upon written notice to the Contractor."

SC-15.03 Delete paragraph 15.03 of the General Conditions in its entirety and insert in its place the following:

"15.03 OWNER'S TERMINATION FOR CONVENIENCE

The Owner may, at any time, terminate the Contract for the Owner's convenience and without cause. Upon receipt of written notice from the Owner of such termination for the Owner's convenience, the Contractor shall:

.1 cease operations as directed by the Owner in the notice;

.2 take actions necessary, or that the Owner may direct, for the protection and preservation of the Work; and

.3 except for Work directed to be performed prior to the effective date of termination stated in the notice, terminate all existing subcontracts and purchase orders and enter into no further subcontracts and/or purchase orders.

In the event of such termination for the Owner's convenience, the Contractor shall be compensated only for Work performed and expenses incurred in accordance with the Contract prior to termination, together with reasonable demobilization expenses (provided that there are appropriated Project funds available for such demobilization expenses). The Owner, however, shall not compensate the Contractor for lost profits, overhead expenses, termination expenses, or other such costs or expenses."

#### **ARTICLE 16 - DISPUTE RESOLUTION**

SC-16.01 Delete paragraph 16.01 A, B and C of the General Conditions in their entirety and insert in its place the following:

"Any Claim arising out of or related to the Contract, except those waived as

provided in herein, shall, after final decision by the Engineer or thirty (30) days after submission of the Claim to the Engineer, be subject to mediation as a condition precedent to the institution of legal or equitable proceedings by either party.

The Owner and Contractor shall endeavor to resolve their Claims by mediation which, unless the parties mutually agree otherwise, shall be conducted under the auspices of the American Arbitration Association in accordance with the most current version of the Association's Construction Industry Mediation Rules in effect at the time the request for mediation is filed. Request for mediation shall be filed in writing with the other party to this Contract and with the American Arbitration Association. All necessary parties may be brought into such mediation.

The parties shall bear equally the mediator's fee and any filing fees required for the mediation. The mediation shall be held in the place where the Project is located, unless another location is mutually agreed upon. Written Contracts reached in mediation shall be enforceable as written settlement Contracts in any court having jurisdiction thereof. In the event that any such claim, dispute or controversy is not resolved through the mediation process, either party is free to pursue any such claim, dispute or other matter in an appropriate court proceeding.

This paragraph 16.01 shall not prohibit the initiation of legal proceedings or equitable proceedings in circumstances where mediation will not be completed before the expiration of the applicable time within which to initiate legal proceedings or equitable proceedings. Under no circumstances shall either party call for mediation of any claim or dispute arising out of this Contract after such period of time as would normally bar the initiation of legal proceedings to litigate such a claim or dispute under the laws of the Commonwealth of Massachusetts.

This Paragraph 16.01 shall survive completion or termination of the Contract."

#### Renumber Article 17 as Article 19, and renumber paragraphs 17.01 thru 17.06 as ARTICLE 17 paragraphs 19.01 thru 19.06.

Insert new paragraphs 17.01 through 17.06 in the General Conditions:

### "ARTICLE 17 - CONTRACTOR'S ACCOUNTING METHOD REQUIREMENTS

(Statutory reference: M.G.L. c.30, §39R)

SC 17.01\*-SC-17.06\* Add new paragraphs 17.01 through 17.06, to the General

Conditions as follows:

"17.01-A\* The words defined herein shall have the meaning stated below whenever they appear in this Article 17:

17.01-A.1 "Contractor" means any person, corporation, partnership, joint venture, sole proprietorship, or other entity awarded a contract pursuant to §39M of c.30, §§44A-44H inclusive, of c.149, §11C of c.25, or §§44-58, inclusive, of c.7C, which is for an amount or estimated amount greater than one hundred thousand dollars.

17.01-A.2 "Contract" means any contract awarded or executed pursuant to §§44-58, inclusive of c.7C, and any contract awarded or executed pursuant to §11C of c.25A, §39M of c.30, or §§44A-44H, inclusive, of c.149, which is for an amount or estimated amount greater than one hundred thousand dollars.

17.01-A.3 "Records" means books of original entry, accounts, checks, bank statements and all other banking documents, correspondence, memoranda, invoices, computer printouts, tapes, discs, papers and other documents or transcribed information of any type, whether expressed in ordinary or machine language.

17.01-A.4 "Independent Certified Public Accountant" means a person duly registered in good standing and entitled to practice as a certified public accountant under the laws of the place of his/her residence or principal office and who is in fact independent. In determining whether an accountant is independent with respect to a particular person, appropriate consideration should be given to all relationships between the accountant and that person or any affiliate thereof. Determination of an accountant's independence shall not be confined to the relationships existing in connection with the filing of reports with the Awarding Authority.

17.01-A.5 "Audit", when used in regard to financial statements, means an examination of records by an independent certified public accountant in accordance with generally accepted accounting principles and auditing standards for the purpose of expressing a CERTIFIED opinion thereon, or, in the alternative, a qualified opinion or a declination to express an opinion for stated reasons.

17.01-A.6 "Accountant's Report", when used in regard to financial statements, means a document in which an independent certified public accountant indicates the scope of the audit which s/he has made and sets forth his/her opinion regarding the financial statements taken as a whole with a listing of noted exceptions and qualifications, or an assertion to the effect that an overall opinion cannot be expressed. When an overall opinion cannot be expressed the reason therefor shall be stated. An accountant's report shall include as a part thereof a

signed statement by the responsible corporate officer attesting that management has fully disclosed all material facts to the independent certified public accountant, and that the audited financial statement is a true and complete statement of the financial condition of the Contractor.

17.01-A.7 "Management", when used herein, means the chief executive officers, partners, principals, or other person or persons primarily responsible for the financial and operational policies and practices of the Contractor.

17.01-A.8 Accounting terms, unless otherwise defined herein, shall have a meaning in accordance with generally accepted accounting principles and auditing standards.

17.02-A Every Contract or contract awarded or executed pursuant to §§44-58, inclusive of c.7C, §11C of c.25A, and pursuant to §39M of c.30 or to §§44A-44H, inclusive, of c.149, shall provide that:

17.02-A.1 The Contractor shall make, and keep for at least six (6) years after final payment, books, records, and accounts which in reasonable detail accurately and fairly reflect the transactions and dispositions of the Contractor.

17.02-A.2 Until the expiration of six (6) years after final payment, the Awarding Authority, Office of Inspector General, and the Commissioner of Capital Asset Management and Maintenance shall have the right to examine any books, documents, papers or records of the Contractor or of his/her Subcontractors that directly pertain to, and involve transactions relating to, the Contractor or his/her Subcontractors.

17.02-A.3 If the Contract is a contract as defined herein, the Contractor shall describe any change in the method of maintaining records or recording transactions which materially affect any statements filed with the Awarding Authority, including in his/her description the date of the change and reasons therefor, and shall accompany said description with a letter from the Contractor's independent certified public accountant approving or otherwise commenting on the changes.

17.02-A.4 If the Contract is a contract as defined herein, the Contractor has filed a statement of management on internal accounting controls as set forth in Paragraph 17.03 below prior to the execution of the contract.

17.02-A.5 If the Contract is a contract as defined herein, the Contractor has filed prior to the execution of the contracts and will continue to file annually, an audited financial statement for the most recent completed fiscal year as set forth

in Paragraph 17.05 below.

17.03-A Every Contractor awarded a contract shall file with the Awarding Authority a statement of management as to whether the system of internal accounting controls of the Contractor and its subsidiaries reasonably assures that:

17.03-A.1 transactions are executed in accordance with management's general and specific authorization;

17.03-A.2 transactions are recorded as necessary:

(i) to permit preparation of financial statements in conformity with generally accepted accounting principles, and

(ii) to maintain accountability for assets;

17.03-A.3 access to assets is permitted only in accordance with management's general or specific authorization; and

17.03-A.4 the recorded accountability for assets is compared with the existing assets at reasonable intervals and appropriate action was taken with respect to any difference.

17.04-A Every Contractor awarded a contract shall also file with the Awarding Authority a statement prepared and signed by an independent certified public accountant, stating that he or she has examined the statement of management on internal accounting controls, and expressing an opinion as to

17.04-A.1 whether the representations of management in response to this paragraph and Paragraph 17.02 above are consistent with the result of management's evaluation of the system of internal accounting controls; and

17.04-A.2 whether such representations of management are, in addition, reasonable with respect to transactions and assets in amounts which would be material when measured in relation to the applicant's financial statements.

17.05-A Every Contractor awarded a contract by the Commonwealth or by any political subdivision thereof shall annually file with the Commissioner of Division of Capital Asset Management during the term of the Contract a financial statement prepared by an independent certified public accountant on the

basis of an audit by such accountant. The final statement filed shall include the date of final payment. All statements shall be accompanied by an accountant's report. Such statement shall be made available to the Owner upon request.

17.06-A Records and statements required to be made, kept or filed under the provisions of this Article 17 shall not be public records as defined in M.G.L. c.4, §7 and shall not be open to public inspection; provided, however, that such records and statements shall be made available pursuant to the provisions of Subparagraph 17.02-A.2 and 17.05-A."

# ARTICLE 18INSERT A NEW ARTICLE 18 IN THE GENERAL CONDITIONS ASFOLLOWS:

#### "ARTICLE 18: NONDISCRIMINATION IN EMPLOYMENT

18.01-A Contracts for work under this bid will obligate the Contractor and Subcontractors not to discriminate in employment practices.

18.02-A Contracts for work under this project will obligate the Contractor and Subcontractors to maintain not less than five (5%) percent ratio of minority employee man hours to total man hours.

18.03-A In connection with the performance of work under the Contract, the Contractor shall not discriminate against any employee or applicant for employment because of race, color, religious creed, national origin, age, sex, gender identity, sexual orientation (which shall not include persons whose sexual orientation involves minor children as the sex object), genetic information, ancestry, children, marital status, veteran status or membership in the armed services, the receiving of public assistance, and handicap. The aforesaid provision shall include, but not be limited to the following: advertising: recruitment; hiring; rates of pay or other forms of compensation; terms, conditions or privileges of employment; employment upgrading; transfer; demotion; layoff; and termination. The Contractor shall post hereafter in conspicuous places, available for employees and applicants for employment, notices to be provided by the Massachusetts Commission Against Discrimination or other applicable agency of the Commonwealth of Massachusetts setting forth the provisions of the Fair Employment Practices Law of the Commonwealth. The Contractor shall also undertake in good faith, affirmative action measures designed to eliminate any discriminatory barriers in the terms and conditions of employment on the grounds of race, color, religious creed, national origin, age, sex, gender identity, sexual orientation (which shall not include persons whose sexual orientation involves minor children as the sex object; genetic information, ancestry, children, marital status, veteran status or membership in the armed services, the receiving of public assistance, and handicap, and to eliminate and remedy any effects of such discrimination in the past.

18.04-A Successful Bidder shall submit a Contractor's Certification Form and a Subcontractor's Certification Form concerning its employment practices and policies in order to maintain its eligibility to receive the award of the Contract. These forms shall be submitted with the signed Contract Documents."

#### **ARTICLE 19 - MISCELLANEOUS**

SC-19.01-B Add the following new paragraph immediately after paragraph 19.01-A.2. of the General Conditions:

"19.01-B Both the address given in the Bid Form upon which this Agreement is founded, and Contractor's office at or near the site of the Work are hereby designated as places to either of which notices, letters, and other communications to Contractor shall be certified, mailed, or delivered, the delivering at the above named place, or depositing in a postpaid wrapper directed to the first-named place, in any post office box regularly maintained by the post office department, of any notice, letter or other communication to Contractor shall be deemed sufficient service thereof upon Contractor; and the date of said service shall be the date of such delivery or mailing.

The first-named address may be changed at any time by an instrument in writing, executed and acknowledged by Contractor, and delivered to Owner and Engineer in accordance with this Article 19. Nothing herein contained shall be deemed to preclude or render inoperative the service of any notice, letter or other communication upon Contractor personally."

SC-19.01-C Add the following new paragraph 19.01-C to the General Conditions:

Notices given to the Owner shall be given to the Town Administrator, Town of Natick, Natick Town Hall, 13 East Central Street, Natick, MA 01760, to the Director, Natick Department of Public Works, 75 West Street, Natick, MA 01760 and to the Engineer.

SC-19.05-A Delete paragraph 19.05-A (formerly 17.05-A) of the General Conditions and insert the following paragraph:

"A. This Contract shall be governed by and interpreted in accordance with the laws of the Commonwealth of Massachusetts, regardless of choice of law principles".

Insert the following new paragraphs 19.07 through 19.15 in the General Conditions.

"19.07 WAGE RATES

19.07 -A The requirements and provisions of all applicable laws and any amendments thereof or additions thereto as to the employment of labor, and to the schedule of minimum prevailing wage rates established in compliance with laws, including without limitation M.G.L. c.149, §26-27G, shall be a part of these Contract Documents. Copies of Federal and/or State wage schedules are included at the end of Part I of these Supplementary Conditions. If, after the Notice to Proceed, it becomes necessary to employ any person in a trade or occupation not classified in the wage determinations, such person shall be paid at not less than such wages as shall be determined by the officials administrating the laws mentioned above. Such approved minimum rate shall be retroactive to the time of the initial employment of such person on such trade or occupation. Contractor shall notify Owner of his intention to employ persons in trades or occupations not classified in sufficient time for Owner to obtain approved rates for such trades or occupations.

19.07-A.1. The schedules of wages referred to above are minimum rates only, and Owner will not consider any claims for additional compensation made by Contractor because of payment by Contractor of any wage rate in excess of the applicable rate contained in these Contract Documents. All disputes in regard to the payment of wages in excess of these specified in the schedules shall be adjusted by Contractor.

19.07-A.2 The said schedules of wages shall continue to be the minimum rates to be paid during the life of the Agreement and a legible copy of said schedules shall be kept posted in a conspicuous place at the site of the Work.

19.07-A.3 Federal and/or State schedule of minimum prevailing wage rates are included in Part I of these Supplementary Conditions. Where rates differ, the higher rates shall apply as a minimum for that trade.

19.07-A.4 The Contractor shall submit weekly payroll records to the Owner during the progress of the Contract, for each day work is performed and keep them on file for three (3) years.

19.07-A.5 The Contractor should obtain a schedule of minimum prevailing wage rates for every public building construction project from the Owner. It is the Owner's responsibility to ensure that a copy of the wage schedule is provided to all Contractors from whom estimates or bids are solicited for all projects. The Department of Labor and Workforce Development <u>will not</u> issue wage schedules directly to contractors or employees.

19.07-A.6 Once a wage schedule has been issued for a project by the Department of Labor and Workforce Development, it will remain in effect for the entire project. Appeals of wage determinations or classifications of employment may be made to the Department of Labor and Workforce Development Commissioner.

19.07-A.7 A wage schedule issued for a project <u>may not</u> be issued on any other project. If, by chance, the Owner fails to provide a wage schedule to use when figuring your bid, do not use one from another project. In this case, the Contractor should contact the Department of Labor and Workforce Development immediately and urge the Owner to contact the Department of Labor and Workforce Development to correct the oversight.

19.07-A.8 The failure of the Owner to provide a wage schedule does not excuse the Contractor from paying the minimum prevailing wage rate.

19.07-A.9 The Attorney General's Division of Fair Labor & Business Practices enforces the minimum prevailing wage law. All bids shall reflect minimum prevailing wage rates. CONTRACTORS may be required by an awarding authority to "demonstrate how they could complete the project and comply with Mass. Gen. Laws". The Division issued an "Advisory" discussing these and other points. For a copy, please contact the Attorney General's Office.

19.07-A.10 Minimum prevailing wages shall be paid to all employees on public building construction projects regardless of whether they are employed by the General Contractor, a filed sub-bidder or any sub-contractor. The minimum prevailing wage applies equally to unionized and non-unionized workers.

19.07-A.11 All employees who perform work on a public building construction project shall be paid hourly according to the wage schedule issued for the particular project.

19.07-A.12 The wage schedule issued for each project is in effect for the duration of that project. All wage increases listed on the schedule shall be paid on the specified dates.

19.07-A.13 Contractors are limited in the deductions that can be made from the hourly rate (represented as the "total rate" on the wage schedules). Only contributions to the following plans may be deducted:

- Health and Welfare
- Pension
- Supplementary Unemployment

All contributions shall be made to bona fide plans.

19.07-A.14 If the Contractor contributes to any, or all, of the above plans, it may deduct the hourly amount contributed from the "total rate". If the Contractor does not contribute to any of the benefit plans listed above, then the hourly rate of pay will be the "total rate" from the wage schedule.

19.07-A.15 All other deductions, including but not limited to the following, <u>may</u> <u>not</u> be subtracted from the employee's hourly minimum prevailing wage rate:

- Vacation Time
- Sick Time
- Training Funds
- Charitable Contributions
- Workers Compensation
- Unemployment Insurance
- Uniforms

19.07-A.16 Overtime, which shall be paid to all employees who work more than forty (40) hours per week, shall be at least time-and-one-half the base rate ("total rate" less benefits, if any).

19.07-A.17 Any "separate check" given to any employee as the "benefit portion" of the minimum prevailing wage may not be treated differently than the check for "base wages". All "separate checks" are considered wages and subject to state and federal taxes, unemployment insurance and worker's compensation requirements.

19.07-A.18 A reporting form is sent along with each wage schedule that may be used. Each report <u>shall</u> contain at least: the employee's name, address, occupational classification, hours worked and wages paid. <u>Do not</u> submit weekly payroll reports to the Department of Labor and Workforce Development.

19.07-A.19 After the Contractor completes its portion of the public building construction project, the Contractor shall submit a Statement of Compliance to the Department of Labor and Workforce Development. A Statement of Compliance form is also sent along with each wage schedule issued.

19.07-A.20 Apprentices shall be registered with the Division of Apprentice Training (DAT). All persons not registered with DAT shall be paid the "total rate" listed on the wage schedule. An apprentice sheet showing percentages based on the apprentice steps is included with all wage schedules.

19.07-A.21 Failure to pay the minimum prevailing wage subjects the Contractor to potential civil and criminal liability.

"SC-19.08-A If any provision of the Contract Documents is determined to be invalid or unenforceable by final judgment of a court of competent jurisdiction, the remaining provisions shall continue in effect to the extent permitted by law.

SC-19.09-A All provisions of law required to be inserted in the Contract Documents shall be and are inserted herein. If any such provision is not herein inserted or inserted in improper form, upon the application of either party, the Contract Documents shall be changed by the Owner, at no increase in contract sum or contract time, so as to strictly comply with the law and without prejudice to the rights of either party herein. SC-19.10-A No forbearance or indulgence in any form or manner by the Owner shall be construed as a waiver or in any way limit the legal or equitable remedies available to the Owner. No waiver by the Owner of any default or breach shall constitute a waiver of any subsequent default or breach.

SC-19.11-A Attorney's Fees. In the event that any legal or equitable action, suit, or claim, counter-claim, cross-claim, or third-party claim of any kind relating to the Contract is filed, pleaded or initiated by the Owner or Contractor against the other party to the Contract, which results in a judgment, award or order of any kind in favor of the Owner, the Contractor shall be responsible for all reasonable costs, expenses, attorney's fees and expert witness fees incurred by the Owner in filing, prosecuting, maintaining, appealing or defending against such action, suit, or claim, counter-claim, cross-claim, or third-party claim.

SC-19.12-A Any cause of action which the Owner may have in connection with Work shall be deemed to accrue only when the Owner has obtained actual knowledge of the act of omission which gives rise to the cause of action, not before.

SC-19.13-A No officer, member of a board, commission or committee, employee or agent of the Owner shall be personally or individually liable to the Contractor with respect to the Contract or the Work. Each subcontract shall include the foregoing limitation, which shall be effective if the Owner ever succeeds to the Contractor's rights and obligations under the subcontract.

SC-19.14-A The Contract may be amended only by written Contract of the parties.

SC-19.15-A The Contract may not be assigned by the Contractor without the prior written assent of the Owner."

Insert a new Article 20 in the General Conditions, as follows:

#### ARTICLE 20: ADDITIONAL PROVISIONS

20.01 Certification of Tax Compliance - By entering into an Contract with the Owner, the Contractor certifies under the penalties of perjury, pursuant to M.G.L. Chapter 62C, Section 49A(b), that it has complied with all laws of the Commonwealth of Massachusetts relating to taxes, to the reporting of employees and Contractors, and to the withholding and remitting of child support.

20.02 Conflict of Interest - The Contractor understands that the Massachusetts

Conflict of Interest Law, Chapter 268A of the Massachusetts General Laws, applies to the Contractor with respect to the services required to be provided under the Contract. The Contractor and its officers, employees, agents, Subcontractors and affiliated agencies shall not participate in any activity which constitutes a violation of the Massachusetts Conflict of Interest Law or which creates an appearance of a violation of the Massachusetts Conflict of Interest Law.

20.03 Non-Collusion - By entering into the Contract with the Owner, the Contractor certifies under penalties of perjury that its bid has been made and submitted in good faith and without collusion or fraud with any person. As used in this certification, the word "person" shall mean any natural person, business, partnership, corporation, union, committee, club, or other organization, entity, or group of individuals.

20.04 Independent Contractor Status - The Contractor shall provide services under any Contract with the Owner as an independent contractor with the Town of Natick and not as an employee of the Town of Natick. No employee, agent or representative of the Contractor shall be entitled to receive any benefits of employment with the Town of Natick, including without limitation salary, overtime, vacation pay, holiday pay, sick leave, health insurance, life insurance, pension or deferred compensation.

20.05 Additional Statutory Incorporations - The provisions of M.G.L. Chapter 149, Sections 34 (Public contracts; stipulation as to hours and days of work; void contracts), 34A (Contracts for public works; workers' compensation insurance; breach of contract; enforcement and violation of statute ), and 34B (Contracts for public works; wages for reserve police officer) shall hereby be incorporated into this Contract by reference.

#### **ARTICLE 21: MINIMUM PREVAILING WAGE RATES**

21.1 The following Minimum Prevailing Wage Rates (Heavy Construction) as determined by the Commissioner of the Department of Labor and Workforce Development under the provisions of the Massachusetts General Laws, Chapter 149, Sections 26 to 27D, as amended, (the Prevailing Wage Act) apply to this project. It is the responsibility of the Contractor, before bid opening, to request if necessary, any additional information on Minimum Prevailing Wage Rates for those tradespeople whore not covered by the following schedule of wage rates, but who may be employed for the proposed work under this Contract.

#### SUPPLEMENTARY CONDITIONS

#### TABLE OF CONTENTS

#### PART II

#### **DESCRIPTION**

- 1. Commonwealth of Massachusetts Provisions
  - Chapter 30 M.G.L. Section 39F Chapter 30 M.G.L. Section 39G Chapter 30 M.G.L. Section 39K Chapter 30 M.G.L. Section 39M Chapter 30 M.G.L. Section 39N Chapter 30 M.G.L. Section 39O Chapter 30 M.G.L. Section 39P Chapter 30 M.G.L. Section 39P Chapter 149 M.G.L. Section 25 Chapter 149 M.G.L. Section 26 Chapter 149 M.G.L. Section 34 Chapter 149 M.G.L. Section 34A Chapter 149 M.G.L. Section 34B Chapter 149 M.G.L. Section 34B Chapter 149 M.G.L. Section 44A Chapter 149 M.G.L. Section 44A

Change Order Form

### SUPPLEMENTARY CONDITIONS

### PART II - STATE AND LEGAL GOVERNMENT PROVISIONS

State and Local Government provisions included herein, have been selected from those to which specific references have been made elsewhere in the Contract Documents. Each and every other provision of law or clause required by law to be inserted in this Contract shall be deemed to be inserted herein, and the Contract shall be read and enforced as though it were included herein and our provision contrary to such law or clause shall be deemed null and void. If through mistake or otherwise any such provision is not correctly inserted, then upon the application of either party, the Contract shall forthwith be physically amended to make such insertion.

1.0 State Government Provisions were current as of February 6, 2017.

1.1 Contractor and Owner agree that the following provisions of the Commonwealth of Massachusetts apply to the work to be performed under this Contract, and that these provisions supersede any conflicting provisions of said Contract.

1.1.1 CHAP. 30 M.G.L, SECTION 39F

Construction contracts; assignment and subrogation; Subcontractor defined; enforcement of claim for direct payment; deposit, reduction of disputed amounts

(1) Every contract awarded pursuant to sections forty four A to L, inclusive of chapter one hundred and forty nine, shall contain the following subparagraphs (a) through (i) and every contract awarded pursuant to section thirty-nine M of chapter thirty shall contain the following subparagraphs (a) through (h) and in each case those subparagraphs shall be binding between the General Contractor and each Subcontractor.

(a) Forthwith after the General Contractor receives payment on account of a periodic estimate, the General Contractor shall pay to each Subcontractor the amount paid for the labor performed and the materials furnished by that Subcontractor, less any amount specified in any court proceedings barring such payment and also less any amount claimed due from the Subcontractor by the General Contractor.

(b) Not later than the sixty fifth day after each Subcontractor substantially completes his work in accordance with the Plans and Specifications, the entire balance due under the subcontract less amounts retained by the Awarding Authority as the estimated cost of completing the incomplete and unsatisfactory items of work, shall be due the Subcontractor; and the Awarding Authority shall pay that amount to the General Contractor. The General Contractor shall forthwith pay to the Subcontractor the full amount received from the Awarding Authority less any amount specified in any court proceedings barring such payment and also less any amount claimed due from the Subcontractor by the General Contractor. (c) Each payment made by the Awarding Authority to the General Contractor pursuant to sub paragraphs (a) and (b) of this paragraph for the labor performed and the materials furnished by a Subcontractor shall be made to the General Contractor for the account of that Subcontractor; and the Awarding Authority shall take reasonable steps to compel the General Contractor to make each such payment to each such Subcontractor. If the Awarding Authority has received a demand for direct payment from a Subcontractor for any amount which has already been included in a payment to the General Contractor as provided in a payment to the General Contractor for payment to the Subcontractor as provided in sub paragraphs (a) and (b), the Awarding Authority shall act upon the demand as provided in this section.

If, within seventy (70) days after the Subcontractor has Substantially Completed (d)the subcontract work, the Subcontractor has not received from the General Contractor the balance due under the subcontract including any amount due for extra labor and materials furnished to the General Contractor, less any amount retained by the Awarding Authority as the estimated cost of completing the incomplete and unsatisfactory items of work, the Subcontractor may demand direct payment of that balance from the Awarding Authority. The demand shall be by a sworn statement delivered to or sent by certified mail to the Awarding Authority, and a copy shall be delivered to or sent by certified mail to the General Contractor at the same time. The demand shall contain a detailed breakdown of the balanced due under the subcontract and also a statement of the status of completion of the subcontract work. Any demand made after Substantial Completion of the subcontract work shall be valid even if delivered or mailed prior to the seventieth day after the Subcontractor has substantially completed the subcontract work. Within ten (10) days after the Subcontractor has delivered or so mailed the demand to the Awarding Authority and delivered or so mailed a copy to the General Contractor, the General Contractor may reply to the demand. The reply shall be by a sworn statement delivered to or sent by certified mail to the Awarding Authority and a copy shall be delivered to or sent by certified mail to the Subcontractor at the same time. The reply shall contain a detailed breakdown of the balance due under the subcontract including any amount due for extra labor and materials furnished to the General Contractor and of the amount due for each claim made by the General Contractor against the Subcontractor.

(e) Within fifteen (15) days after receipt of the demand by the Awarding Authority, but in no event prior to the seventieth day after Substantial Completion of the subcontract work, the Awarding Authority shall make direct payment to the Subcontractor of the balance due under the subcontract including any amount due for extra labor and materials furnished to the General Contractor, less any amount (i) retained by the Awarding Authority as the estimated cost of completing the incomplete or unsatisfactory items of work, (ii) specified in any court proceedings barring such payment, or (iii) disputed by the General Contractor in the sworn reply; provided, that the Awarding Authority shall not deduct from a direct payment any amount as provided in part (iii) if the reply is not sworn to, or for which the sworn reply does not contain the detailed breakdown required by subparagraph (d). The Awarding Authority shall make further direct payments to the Subcontractor forthwith after the removal of the basis for deductions from direct payments made as provided in parts (i) and (ii) of this sub paragraph.

(f) The Awarding Authority shall forthwith deposit the amount deducted from a direct payment as provided in part (iii) of subparagraph (e) in an interest-bearing joint account in the names of the General Contractor and the Subcontractor in a bank in Massachusetts selected by the Awarding Authority or agreed upon by the General Contractor and the Subcontractor and the Subcontractor and the Subcontractor and the deposit and the bank receiving the deposit. The bank shall pay the amount in the account, including accrued interest, as provided in an agreement between the General Contractor and the Subcontractor or as determined by decree of a court of competent jurisdiction.

(g) All direct payments and all deductions from demands for direct payments deposited in an interest bearing account or accounts in a bank pursuant to subparagraph (f) shall be made out of amounts payable to the General Contractor at the time of receipt of a demand for direct payment from a Subcontractor and out of amounts which later become payable to the General Contractor and in the order of receipt of such demands from Subcontractors. All direct payments shall discharge the obligation of the Awarding Authority to the General Contractor to the extent of such payment.

(h) The Awarding Authority shall deduct from payments to a General Contractor amounts which, together with the deposits in interest bearing accounts pursuant to subparagraph (f), are sufficient to satisfy all unpaid balances of demands for direct payment received from Subcontractors. All such amounts shall be earmarked for such direct payments, and the Subcontractors shall have a right in such deductions prior to any claims against such amounts by creditors of the General Contractor.

(i) If the Subcontractor does not receive payment as provided in subparagraph (a) or if the General Contractor does not submit a periodic estimate for the value of the labor or materials performed or furnished by the Subcontractor and the Subcontractor does not receive payment for same when due less the deductions provided for in subparagraph (a), the Subcontractor may demand direct payment by following the procedure in subparagraph (d) and the General Contractor may file a sworn reply as provided in that same subparagraph. A demand made after the first day of the month following that for which the Subcontractor performed or furnished the labor and materials for which the Subcontractor seeks payment shall be valid even if delivered or mailed prior to the time payment was due on a periodic estimate from the General Contractor. Thereafter the Awarding Authority shall proceed as provided in subparagraph (e), (f), (g) and (h).

(2) Any assignment by a Subcontractor of the rights under this section to a surety company furnishing a bond under the provisions of section twenty nine of chapter one hundred forty nine shall be invalid. The assignment and subrogation rights of the surety to amounts included in a demand for direct payment which are in the possession of the Awarding Authority or which are on deposit pursuant to subparagraph (f) of paragraph (1) shall be subordinate to the rights of all Subcontractors who are entitled to be paid under this section and who have not been paid in full.

(3) "Subcontractor" as used in this section (i) for contracts awarded as provided in sections forty four A to forty four H, inclusive, of chapter one hundred forty nine shall mean a person

who files a sub bid and receives a subcontract as a result of that filed sub bid or who is approved by the Awarding Authority in writing as a person performing labor or both performing labor and furnishing materials pursuant to a contract with the General Contractor, (ii) for contracts awarded as provided in Paragraph (a) of section thirty nine M of chapter thirty shall mean a person approved by the Awarding Authority in writing as a person performing labor or both performing labor and furnishing materials pursuant to a contract with the General Contractor, and (iii) for contracts with the Commonwealth not awarded as provided in forty four A to forty four H, inclusive, of chapter one hundred forty nine shall also mean a person contracting with the General Contractor to supply materials used or employed in a public works project for a price in excess of five thousand dollars (\$5,000.00).

(4) A General Contractor or a Subcontractor shall enforce a claim to any portion of the amount of a demand for direct payment deposited as provided in subparagraph (f) of paragraph (1) by a petition in equity in the superior court against the other and the bank shall not be a necessary party. A Subcontractor shall enforce a claim for direct payment or a right to require a deposit as provided in subparagraph (f) of paragraph (1) by a petition in equity in the superior court against the Awarding Authority and the General Contractor shall not be a necessary party. Upon motion of any party the court shall advance for speedy trial any petition filed as provided in this paragraph. Sections fifty nine and fifty nine B of chapter two hundred thirty one2 shall apply to such petitions. The court shall enter an interlocutory decree upon which execution shall issue for any part of a claim found due pursuant to sections fifty nine and fifty nine B and, upon motion of any party, shall advance for speedy trial the petition to collect the remainder of the claim. Any party aggrieved by such interlocutory decree shall have the right to appeal therefrom as from a final decree. The court shall not consolidate for trial the petition of any Subcontractor with the petition of one or more Subcontractors or the same General Contract unless the court finds that a substantial portion of the evidence of the same events during the course of construction (other than the fact that the claims sought to be consolidated arise under the same General Contract) is applicable to the petitions sought to be consolidated and that such consolidation will prevent unnecessary duplication of evidence. A decree in any such proceeding shall not include interest on the disputed amount deposited in excess of the interest earned for the period of any such deposit. No person except a Subcontractor filing a demand for direct payment for which no funds due the General Contractor are available for direct payment shall have a right to file a petition in court of equity against the Awarding Authority claiming a demand for direct payment is premature and such Subcontractor must file the petition before the Awarding Authority has made a direct payment to the Subcontractor and has made a deposit of the disputed portion as provided in part (iii) of subparagraph (e) and in subparagraph (f) of paragraph (1).

(5) In any petition to collect any claim for which a Subcontractor has filed a demand for direct payment the court shall, upon motion of the General Contractor, reduce by the amount of any deposit of a disputed amount by the Awarding Authority as provided in part (iii) of subparagraph (e) and in subparagraph (f) of paragraph (1) any amount held under a trustee writ or pursuant to a restraining order or injunction.

# 1.1.2 CHAP. 30 M.G.L. SECTION 39G

Completion of public works; semi-final and final estimates; payments; extra work; disputed items

Upon Substantial Completion of the work required by a contract with the Commonwealth, or any agency or political subdivision thereof, for the construction, reconstruction, alteration, remodeling, repair or improvement of public ways, including bridges and other highway structures, sewers and water mains, airports and other public works, the Contractor shall present in writing to the Awarding Authority its certification that the work has been Substantially Completed. Within twenty one (21) days thereafter, the Awarding Authority shall present to the Contractor either a written declaration that the work has been Substantially Completed or an itemized list of incomplete or unsatisfactory work items required by the contract sufficient to demonstrate that the work has not been Substantially Completed. The Awarding Authority may include with such list a notice setting forth a reasonable time, which shall not in any event be prior to the contract completion date, within which the Contractor must achieve Substantial Completion of the work. In the event that the Awarding Authority fails to respond, by presentation of a written declaration or itemized list as aforesaid, to the Contractor's certification shall take effect as the Awarding Authority's declaration that the work has been Substantially Completed.

Within sixty-five (65) days after the effective date of a declaration of a substantial completion, the awarding authority shall prepare and forthwith send to the contractor for acceptance a substantial completion estimate for the quantity and price of the work done and all but one per cent retainage, if held by the awarding authority, on that work, including the quantity, price and all but one per cent retainage, if held by the awarding authority, for the undisputed part of each work item and extra work item in dispute but excluding the disputed part thereof, less the estimated cost of completing all incomplete and unsatisfactory work items and less the total periodic payments made to date for the work. The awarding authority also shall deduct from the substantial completion estimate an amount equal to the sum of all demands for direct payment filed by subcontractors and not yet paid to subcontractors or deposited in joint accounts pursuant to section thirty-nine F, but no contract subject to said section thirty-nine F shall contain any other provision authorizing the awarding authority to deduct any amount by virtue of claims asserted against the contract by subcontractors, material suppliers or others.

If the Awarding Authority fails to prepare and send to the Contractor any Substantial Completion estimate required by this section on or before the date herein above set forth, the Awarding Authority shall pay to the Contractor interest on the amount which would have been due to the Contractor pursuant to such Substantial Completion estimate at the rate of three percentage points above the rediscount rate then charged by the Federal Reserve Bank of Boston from such date to the date on which the Awarding Authority sends that Substantial Completion estimate to the Contractor for acceptance or to the date of payment therefor, whichever occurs first. The Awarding Authority shall include the amount of such interest in the Substantial Completion Estimate.

Within fifteen (15) days after the effective date of the declaration of Substantial Completion, the Awarding Authority shall send to the Contractor by certified mail, return receipt

requested, a complete list of all incomplete or unsatisfactory work items, and, unless delayed by causes beyond his control, the Contractor shall complete all such work items within forty five (45) days after the receipt of such list or before the then contract completion date, whichever is later. If the Contractor fails to complete such work within such time, the Awarding Authority may, subsequent to seven (7) days written notice to the Contractor by certified mail, return receipt requested, terminate the contract and complete the incomplete or unsatisfactory work items and charge the cost of same to the Contractor.

Within thirty (30) days after receipt by the awarding authority of a notice from the contractor stating that all of the work required by the contract has been completed, the awarding authority shall prepare and forthwith send to the contractor for acceptance a final estimate for the quantity and price of the work done and all retainage, if held by the awarding authority, on that work less all payments made to date, unless the awarding authority's inspection shows that work items required by the contract remain incomplete or unsatisfactory, or that documentation required by the contract has not been completed. If the awarding authority fails to prepare and send to the contractor the final estimate within thirty (30) days after receipt of notice of completion, the awarding authority shall pay to the contractor interest on the amount which would have been due to the contractor pursuant to such final estimate at the rate hereinabove provided from the thirtieth day after such completion until the date on which the awarding authority sends the final estimate to the contractor for acceptance or the date of payment therefor, whichever occurs first, provided that the awarding authority's inspection shows that no work items required by the contract remain incomplete or unsatisfactory. Interest shall not be paid hereunder on amounts for which interest is required to be paid in connection with the substantial completion estimate as hereinabove provided. The awarding authority shall include the amount of the interest required to be paid hereunder in the final estimate.

The Awarding Authority shall pay the amount due pursuant to any periodic, Substantial Completion or final estimate within thirty five (35) days after receipt of written acceptance for such estimate from the Contractor and shall pay interest on the amount due pursuant to such estimate at the rate hereinabove provided from that thirty-fifth (35th) day to the date of payment. Within fifteen (15) days, thirty (30) days in the case of the Commonwealth, after receipt from the Contractor, at the place designated by the Awarding Authority, if such place is so designated, of a periodic estimate requesting payment of the amount due for the preceding periodic estimate period, the Awarding Authority shall make a periodic payment to the Contractor for the work performed during the preceding periodic estimate period and for the materials not incorporated in the work but delivered and suitably stored at the site, or at some location agreed upon in writing. to which the Contractor has title or to which a Subcontractor has title and has authorized the Contractor to transfer title to the Awarding Authority, upon certification by the Contractor that he is the lawful owner and that the materials are free from all encumbrances. The Awarding Authority shall include with each such payment interest on the amount due pursuant to such periodic estimate at the rate herein above provided from the due date. In the case of periodic payments, the contracting authority may deduct from its payment a retention based on its estimate of the fair value of its claims against the Contractor, a retention for direct payments to Subcontractors based on demands for same in accordance with the provisions of section thirty nine F, and a retention to secure satisfactory performance of the contractual work not exceeding five per cent (5%) of the approved amount of any periodic payment, and the same right to

retention shall apply to bonded Subcontractors entitled to direct payment under section thirty nine F of chapter thirty; provided, that a five per cent value of all items that are planted in the ground shall be deducted from the periodic payments until final acceptance.

No periodic, Substantial Completion or final estimate or acceptance or payment thereof shall bar a Contractor from reserving all rights to dispute the quantity and amount of, or the failure of the Awarding Authority to approve a quantity and amount of, all or part of any work item or extra work item.

Substantial Completion, for the purposes of this section, shall mean either that the work required by the Contract has been completed except for work having a contract price of less than one per cent (1%) of the then adjusted total contract price, or substantially all of the work has been completed and opened to public use except for minor incomplete or unsatisfactory work items that do not materially impair the usefulness of the work required by the Contract.

#### 1.1.3 CHAP. 30 MGL SECTION 39K

#### Public building construction contracts; payments

Every contract for the construction, reconstruction, alteration, remodeling, repair or demolition of any public building by the Commonwealth, or by any County, City, Town, District, Board, Commission or other public body, when the amount is more than five thousand dollars (\$5,000.00) in the case of the Commonwealth and more than two thousand dollars (\$2,000.00) in the case of any County, City, Town, District, Board, Commission or other public body, shall contain the following paragraph:— Within fifteen (15) days (thirty (30) days in the case of the Commonwealth, including local housing authorities) after receipt from the Contractor, at the place designated by the Awarding Authority if such a place is so designated, of a periodic estimate requesting payment of the amount due for the preceding month, the Awarding Authority will make a periodic payment to the Contractor for the work performed during the preceding month and for the materials not incorporated in the work but delivered and suitably stored at the site (or at some location agreed upon in writing) to which the Contractor has title or to which a Subcontractor has title and has authorized the Contractor to transfer title to the Awarding Authority, upon certification by the contractor that he is the lawful owner and that the materials are free from all encumbrances, but less (1) a retention based on its estimate of the fair value of its claims against the Contractor and less (2) a retention for direct payments to Subcontractors based on demands for same in accordance with the provisions of section thirty nine F, and less (3) a retention not exceeding five per cent (5%) of the approved amount of the periodic payment. After the receipt of a periodic estimate requesting final payment and within sixty five (65) days after (a) the Contractor fully completes the work or Substantially Completes the work so that the value of the work remaining to be done is, in the estimate of the Awarding Authority, less than one per cent (1%) of the original Contract Price, or (b) the Contractor Substantially Completes the work and the Awarding Authority takes possession for occupancy, whichever occurs first, the Awarding Authority shall pay the Contractor the entire balance due on the contract less (1) a retention based on its estimate of the fair value of its claims against the Contractor and of the cost of completing the incomplete and unsatisfactory items of work and less (2) a retention for direct payments to Subcontractors based on demands for same in

accordance with the provisions of section thirty nine F, or based on the record of payments by the Contractor to the Subcontractors under this contract if such record of payment indicates that the Contractor has not paid Subcontractors as provided in section thirty nine F. If the Awarding Authority fails to make payment as herein provided, there shall be added to each such payment daily interest at the rate of three (3) percentage points above the rediscount rate then charged by the Federal Reserve Bank of Boston commencing on the first day after said payment is due and continuing until the payment is delivered or mailed to the Contractor; provided, that no interest shall be due, in any event, on the amount due on a periodic estimate for final payment until fifteen (15) days (twenty four (24) days in the case of the Commonwealth) after receipt of such a periodic estimate from the Contractor, at the place designated by the Awarding Authority if such a place is so designated. The Contractor agrees to pay to each Subcontractor a portion of any such interest paid in accordance with the amount due each Subcontractor.

The Awarding Authority may make changes in any periodic estimate submitted by the Contractor and the payment due on said periodic estimate shall be computed in accordance with the changes so made, but such changes or any requirement for a corrected periodic estimate shall not affect the due date for the periodic payment or the date for the commencement of interest charges on the amount of the periodic payment computed in accordance with the changes made, as provided herein; provided, that the Awarding Authority may, within seven (7) days after receipt, return to the Contractor for correction, any periodic estimate which is not in the required form or which contains computations not arithmetically correct and, in that event, the date of receipt of such periodic estimate shall be the date of receipt of the corrected periodic estimate in proper form and with arithmetically correct computations. The date of receipt of a periodic estimate received on a Saturday shall be the first working day thereafter. The provisions of section thirty nine G shall not apply to any contract for the construction, reconstruction, alteration, remodeling, repair or demolition of any public building to which this section applies.

All periodic estimates shall be submitted to the Awarding Authority, or to its designee as set forth in writing to the Contractor, and the date of receipt by the Awarding Authority or its designee shall be marked on the estimate. All periodic estimates shall contain a separate item for each filed subtrade and each sub subtrade listed in sub bid form as required by Specifications and a column listing the amount paid to each Subcontractor and Sub-Subcontractor as of the date the periodic estimate is filed. The person making payment for the Awarding Authority shall add the daily interest provided for herein to each payment for each day beyond the due date based on the date of receipt marked on the estimate.

A certificate of the Architect to the effect that the Contractor has fully or Substantially Completed the work shall, subject to the provisions of section thirty nine J, be conclusive for the purposes of this section.

Notwithstanding the provisions of this section, at any time after the value of the work remaining to be done is, in the estimation of the awarding authority, less than one per cent (1%) of the adjusted contract price, or the awarding authority has determined that the Contractor has substantially completed the work and the Awarding Authority has taken possession for

occupancy, the Awarding Authority may send to the General Contractor by certified mail, return receipt requested, a complete and final list of all incomplete and unsatisfactory work items, including, for each item on the list, a good faith estimate of the fair and reasonable cost of completing such item. The General Contractor shall then complete all such work items within thirty (30) days of receipt of such list or before the contract completion date, whichever is later. If the General Contractor fails to complete all incomplete and unsatisfactory work items within forty-five (45) days after receipt of such items furnished by the Awarding Authority or before the contract completion date, whichever is later, subsequent to an additional fourteen (14) days' written notice to the General Contractor by certified mail, return receipt requested, the Awarding Authority may terminate the contract and complete the incomplete and unsatisfactory work items and charge the cost of same to the General Contractor and such termination shall be without prejudice to any other rights or remedies the Awarding Authority may have under the contract. The Awarding Authority shall note any such termination in the evaluation form to be filed by the Awarding Authority pursuant to the provisions of section forty-four D of chapter one hundred and forty-nine.

# 1.1.4 CHAP. 30 MGL SECTION 39M

#### Contracts for construction and materials; manner of awarding

(a) Every contract for the construction, reconstruction, alteration, remodeling or repair of any public work, or for the purchase of any material, as hereinafter defined, by the commonwealth, or political subdivision thereof, or by any county, city, town, district or housing authority that is and estimated by the awarding authority to cost less than \$10,000 dollars shall be obtained through the exercise of sound business practices as defined in section 2 of chapter 30B. The awarding authority shall make and keep a record of each procurement that, at a minimum, shall include the name and address of the person from whom the services were procured. An awarding authority that utilizes a vendor on a statewide contract procured through the operational services division, or a blanket contract procured by the awarding authority pursuant to this section, shall be deemed to have obtained the contract through sound business practices.

Every contract for the construction, reconstruction, alteration, remodeling or repair of any public work, or for the purchase of any material, as hereinafter defined, by the commonwealth, or political subdivision thereof, or by any county, city, town, district or housing authority that is estimated by the awarding authority to cost not less than \$10,000 but not more than \$50,000 shall be awarded to the responsible bidder offering to perform the contract at the lowest price. The awarding authority shall make public notification of the contract and shall seek written responses from no fewer than 3 persons who customarily perform such work. For purposes of this subsection, the term "public notification" shall include, but need not be limited to, posting, at least 2 weeks before the time specified in the notification for the receipt of responses, the contract and scope-of-work statement: (1) on the website of the awarding authority, (2) on the COMMBUYS system administered by the operational services division, (3) in the central register published pursuant to section 20A of chapter 9 and (4) in a conspicuous place in or near

the primary office of the awarding authority; provided, however, that if the awarding authority obtains a minimum of 2 written responses from a vendor list established through a blanket contract or a statewide contract procured through the operational services division, and the lowest of those written responses is deemed acceptable to the awarding authority, public notification is not required. The solicitation shall include a scope-of-work statement that defines the work to be performed and provides potential responders with sufficient information regarding the objectives and requirements of the awarding authority and the time period within which the work shall be completed. The awarding authority shall record the names and addresses of all persons from whom written responses were sought, the names of the persons submitting written responses and the date and amount of each written response.

An awarding authority may utilize a vendor list established through a statewide contract procured through the operational services division to identify 1 or more of the persons from whom it will seek written responses for purposes of this subsection. An awarding authority may also procure a blanket contract to establish a listing of vendors in certain defined categories of work that are under contract to provide services for multiple individual tasks of not more than \$50,000 each, and from whom written responses will be sought. Any such blanket contract procured by the awarding authority shall be procured pursuant to this section or sections 44A to 44J, inclusive, of chapter 149 which are applicable to projects over \$50,000.

Every contract for the construction, reconstruction, alteration, remodeling or repair of any public work, or for the purchase of any material, as hereinafter defined, by the commonwealth, or political subdivision thereof, or by any county, city, town, district or housing authority that is estimated by the awarding authority to cost more than \$50,000, and every contract for the construction, reconstruction, installation, demolition, maintenance or repair of any building by a public agency, as defined by subsection (1) of section 44A of chapter 149, estimated to cost more than \$50,000 but not more than \$150,000, shall be awarded to the lowest eligible responsible bidder on the basis of competitive bids publicly opened and read by the awarding authority forthwith upon expiration of the time for the filing thereof; provided, however, that such awarding authority may reject any and all bids, if it is in the public interest to do so. Every bid for such contract shall be accompanied by a bid deposit in the form of: (1) a bid bond, (2) cash, or (3) a certified check on, or a treasurer's or cashier's check issued by, a responsible bank or trust company, payable to the awarding authority. The amount of the bid deposit shall be 5 per cent of the value of the bid. Any person submitting a bid pursuant to this section shall, on such bid, certify as follows:

The undersigned certifies under penalties of perjury that this bid is in all respects bona fide, fair and made without collusion or fraud with any other person. As used in this paragraph the word "person" shall mean any natural person, joint venture, partnership, corporation or other business or legal entity.

(Name of person signing bid)

#### (Company)

This subsection shall not apply to the award of any contract subject to the provisions of sections 44A to 44J, inclusive, of chapter 149 and every such contract shall continue to be awarded as provided therein. In cases of extreme emergency: (1) caused by enemy attack, sabotage or other such hostile actions or (2) resulting from an imminent security threat explosion, fire, flood, earthquake, hurricane, tornado or other such catastrophe, an awarding authority may, without competitive bids and notwithstanding any general or special law, award contracts otherwise subject to this subsection to perform work and to purchase or rent materials and equipment, all as may be necessary for temporary repair and restoration to service of any and all public work in order to preserve the health and safety of persons or property; provided, that this exception shall not apply to any permanent reconstruction, alteration, remodeling or repair of any public work.

- (b) Specifications for such contracts, and specifications for contracts awarded pursuant to the provisions of said sections forty-four A to forty-four L of said chapter one hundred and forty-nine, shall be written to provide for full competition for each item of material to be furnished under the contract; except, however, that said specifications may be otherwise written for sound reasons in the public interest stated in writing in the public records of the Awarding Authority or promptly given in writing by the Awarding Authority to anyone making a written request therefor, in either instance such writing to be prepared after reasonable investigation. Every such contract shall provide that an item equal to that named or described in the said specifications may be furnished; and an item shall be considered equal to the item so named or described if, in the opinion of the Awarding Authority: (1) it is at least equal in quality, durability, appearance, strength and design, (2) it will perform at least equally the function imposed by the general design for the public work being contracted for or the material being purchased, and (3) it conforms substantially, even with deviations, to the detailed requirements for the item in the said specifications. For each item of material the specifications shall provide for either a minimum of three (3) named brands of material or a description of material which can be met by a minimum of three (3) manufacturers or producers, and for the equal of any one of said name or described materials.
- (c) The term "lowest responsible and eligible bidder" shall mean the bidder: (1) whose bid is the lowest of those bidders possessing the skill, ability and integrity necessary for the faithful performance of the work; (2) who shall certify, that he is able to furnish labor that can work in harmony with all other elements of labor employed or to be employed in the work; (3) who shall certify that all employees to be employed at the worksite will have successfully completed a course in construction safety and health approved by the United States Occupational Safety and Health Administration that is at least ten (10) hours in duration at the time the employee begins work and who shall furnish documentation of successful

completion of said course with the first certified payroll report for each employee; (4) who, where the provisions of section eight B of chapter twenty-nine apply, shall have been determined to be qualified thereunder; and (5) who obtains within ten (10) days of the notification of contract award the security by bond required under section twenty-nine of chapter one hundred and forty-nine; provided that for the purposes of this section the term "security by bond" shall mean the bond of a surety company qualified to do business under the laws of the commonwealth and satisfactory to the Awarding Authority; provided further, that if there is more than 1 surety company, the surety companies shall be jointly and severally liable.

(d) The provisions of this section shall not apply (1) to the extent that they prevent the approval of such specifications by any contributing federal agency, (2) to materials purchased under specifications of the state department of highways at prices established by the said department pursuant to advertisement and bidding in connection with work to be performed under the provisions of chapter eighty-one or chapter ninety, (3) to any transaction between the commonwealth and any of its political subdivisions or between the commonwealth and any public service corporation, and (4) to any contract of not more than \$50,000 awarded by a governmental body, as defined by section two of chapter thirty B, in accordance with the provisions of section five of said chapter thirty B; and (5) to any contract solely for the purchase of material awarded by a governmental body, as defined by section 2 of chapter 30B, in accordance with section 5 of said chapter 30B, or procured through the operational services division pursuant to sections 22 and 52 of chapter 7.

(e) The word "material" as used in this section shall mean and include any article, assembly, system, or any component part thereof.

#### 1.1.5 CHAP. 30 MGL SECTION 39N

Construction contracts; equitable adjustment in contract price for differing subsurface or latent physical conditions

Every contract subject to section forty-four A of chapter one hundred and forty-nine or subject to section thirty-nine M of chapter thirty shall contain the following paragraph in its entirety and an Awarding Authority may adopt reasonable rules or regulations in conformity with that paragraph concerning the filing, investigation and settlement of such claims:

If, during the progress of the work, the Contractor or the Awarding Authority discovers that the actual subsurface or latent physical conditions encountered at the site differ substantially or materially from those shown on the plans or indicated in the contract documents either the Contractor or the contracting authority may request an equitable adjustment in the contract price of the contract applying to work affected by the differing site conditions. A request for such an adjustment shall be in writing and shall be delivered by the party making such claim to the other party as soon as possible after such conditions are discovered. Upon receipt of such a claim from a Contractor; or upon its own initiative, the contracting authority shall make an investigation of such physical conditions, and, if they differ substantially or materially from those shown on the plans or indicated in the contract documents or from those ordinarily encountered and generally recognized as inherent in work of the character provided for in the plans and contract documents and are of such a nature as to cause an increase or decrease in the cost of performance of the work or a change in the construction methods required for the performance of the work which results in an increase or decrease in the cost of the work, the contracting authority shall make an equitable adjustment in the contract price and the contract shall be modified in writing accordingly.

# 1.1.6 CHAP. 30 MGL SECTION 39O

Contracts for construction and materials; suspension, delay or interruption due to order of awarding authority; adjustment in contract price; written claim

Every contract subject to the provisions of section thirty-nine M of this chapter or subject to section forty-four A of chapter one hundred forty-nine shall contain the following provisions (a) and (b) in their entirety and, in the event a suspension, delay, interruption or failure to act of the Awarding Authority increases the cost of performance to any Subcontractor, that Subcontractor shall have the same rights against the General Contractor for payment for an increase in the cost of his performance as provisions (a) and (b) give the General Contractor against the Awarding Authority, but nothing in provisions (a) and (b) shall in any way change, modify or alter any other rights which the General Contractor or the Subcontractor may have against each other.

(a) The Awarding Authority may order the General Contractor in writing to suspend, delay or interrupt all or any part of the work for such period of time as it may determine to be appropriate for the convenience of the Awarding Authority; provided however, that if there is a suspension, delay or interruption for fifteen (15) days or more or due to a failure of the Awarding Authority to act within the time specified in this contract, the Awarding Authority shall make an adjustment in the contract price for any increase in the cost of performance of this contract but shall not include any profit to the General Contractor on such increase; and provided further, that the Awarding Authority shall not make any adjustment in the contract price under this provision for any suspension, delay, interruption or failure to act to the extent that such is due to any cause for which this contract provides for an equitable adjustment of the contract price under any other contract provisions.

(b) The General Contractor must submit the amount of a claim under provision (a) to the Awarding Authority in writing as soon as practicable after the end of the suspension, delay, interruption or failure to act and, in any event, not later than the date of final payment under this contract and, except for costs due to a suspension order, the Awarding Authority shall not approve any costs in the claim incurred more than twenty (20) days before the General Contractor notified the Awarding Authority in writing of the act or failure to act involved in the claim.

#### 1.1.7 CHAP. 30 MGL SECTION 39P

Contracts for construction and materials; awarding authority's decisions on interpretation of specifications, etc.; time limit; notice

Every contract subject to section thirty-nine M of this chapter or section forty-four A of chapter one hundred forty-nine which requires the Awarding Authority, or any official, its architect or engineer to make a decision on interpretation of the specifications, approval of equipment, material or any other approval, or progress of the work, shall require that the decision be made promptly and, in any event, no later than thirty (30) days after the written submission for decision; but if such decision requires extended investigation and study, the Awarding Authority, the official, architect or engineer shall, within thirty (30) days after the receipt of the submission, give the party making the submission written notice of the reasons why the decision cannot be made within the thirty (30) day period and the date by which the decision will be made.

# 1.1.8(a) CHAP. 30 MGL SECTION 39R

Definitions; contract provisions; management and financial statements; enforcement

(a) The words defined herein shall have the meaning stated below whenever they appear in this section:

(1) "Contractor" means any person, corporation, partnership, joint venture, sole proprietorship, or other entity awarded a contract pursuant to sections thirty-eight A 1/2 to thirty-eight O, inclusive, of chapter seven and any contract awarded or executed pursuant to section eleven C of chapter twenty-five A, section thirty-nine M of chapter thirty, or sections forty-four A to forty-four H, inclusive of chapter one hundred and forty-nine which is for an amount or estimated amount greater than one hundred thousand dollars (\$100,000.00).

(2) "Contract" means any contract awarded or executed pursuant to sections thirty-eight A 1/2 to thirty-eight O, inclusive, of chapter seven and any contract awarded or executed pursuant to section eleven C of chapter twenty-five A, section thirty-nine M of chapter thirty, or sections forty-four A through forty-four H, inclusive of chapter one hundred and forty-nine, which is for amount or estimated amount greater than one hundred thousand dollars (\$100,000.00).

(3) "Records" means books of original entry, accounts, checks, bank statements and all other banking documents, correspondence, memoranda, invoices, computer printouts, tapes, discs, papers and other documents or transcribed information of any type, whether expressed in ordinary or machine language. (4) "Independent Certified Public Accountant" means a person duly registered in good standing and entitled to practice as a certified public accountant under the laws of the place of his residence or principal office and who is in fact independent. In determining whether an accountant is independent with respect to a particular person, appropriate consideration should be given to all relationships between the accountant and that person or any affiliate thereof. Determination of an accountant's independence shall not be confined to the relationships existing in connection with the filing of reports with the Awarding Authority.

(5) "Audit", when used in regard to financial statements, means an examination of records by an independent certified public accountant in accordance with generally accepted accounting principles and auditing standards for the purpose of expressing a certified opinion thereon, or, in the alternative, a qualified opinion or a declination to express an opinion for stated reasons.

(6) "Accountant's Report", when used in regard to financial statements, means a document in which an independent certified public accountant indicates the scope of the audit which he has made and sets forth his opinion regarding the financial statements taken as a whole with a listing of noted exceptions and qualifications, or an assertion to the effect that an overall opinion cannot be expressed. When an overall opinion cannot be expressed the reason therefor shall be stated. An accountant's report shall include as a part thereof a signed statement by the responsible corporate officer attesting that management has fully disclosed all material facts to the independent certified public accountant, and that the audited financial statement is a true and complete statement of the financial condition of the Contractor.

(7) "Management", when used herein, means the chief executive officers, partners, principals or other persons or persons primarily responsible for the financial and operational policies and practices of the Contractor.

(8) Accounting terms, unless otherwise defined herein, shall have a meaning in accordance with generally accepted accounting principles and auditing standards.

(b) Subsection (a)(2) hereof notwithstanding, every agreement or contract awarded or executed pursuant to sections thirty-eight A 1/2 to thirty-eight O, inclusive, of chapter seven, or eleven C of chapter twenty-five A, and pursuant to section thirty-nine M of chapter thirty or to section forty-four A through H, inclusive, of chapter one hundred and forty-nine, shall provide that:

(1) The Contractor shall make, and keep for at least six (6) years after final payment, books, records, and accounts, which in reasonable detail accurately and fairly reflect the transactions and dispositions of the Contractor, and

(2) until the expiration of six (6) years after final payment, the office of inspector general, and the commissioner of capital asset management and maintenance shall have the right to examine any books, documents, papers or records of the Contractor or of his Subcontractors that directly pertain to, and involve transactions relating to, the Contractor or his Subcontractors, and

(3) if the agreement is a contract as defined herein, the Contractor shall describe any change in the method of maintaining records or recording transactions which materially affect any statements filed with the Awarding Authority including in his description the date of the change and reasons therefor, and shall accompany said description with a letter from the Contractor's independent certified public accountant approving or otherwise commenting on the changes, and

(4) if the agreement is a contract as defined herein, the Contractor has filed a statement of management on internal accounting controls as set forth in paragraph(c) below prior to the execution of the contract, and

(5) if the agreement is a contract as defined herein, the Contractor has filed prior to the execution of the contracts and will continue to file annually, an audited financial statement for the most recent completed fiscal year as set forth in paragraph (d) below.

(c) Every Contractor awarded a contract shall file with the Awarding Authority a statement of management as to whether the system of internal accounting controls of the Contractor and its subsidiaries reasonably assures that:

(1) transactions are executed in accordance with management's general and specific authorization;

- (2) transactions are recorded as necessary
  - i. to permit preparation of financial statements in conformity with generally accepted accounting principles, and
    - ii. to maintain accountability for assets;

(3) access to assets is permitted only in accordance with management's general or specific authorization; and

(4) the recorded accountability for assets is compared with the existing assets at reasonable intervals and appropriate action was taken with respect to any difference.

Every Contractor awarded a contract shall also file with the Awarding Authority a statement prepared and signed by an independent certified public accountant, stating that he has examined the statement of management on internal accounting controls, and expressing an opinion as to:

(1) whether the representations of management in response to this paragraph and paragraph (b) above are consistent with the result of management's evaluation of the system of internal accounting controls; and

(2) whether such representations of management are, in addition, reasonable with respect to transactions and assets in amounts which would be material when measured in relation to the applicant's financial statements.

(d) Every Contractor awarded a contract by the commonwealth or by any political subdivision thereof shall annually file with the commissioner of capital asset management and maintenance during the term of the contract a financial statement prepared by an independent certified public accountant on the basis of an audit by such accountant. The final statement filed shall include the date of final payment. All statements shall be accompanied by an accountant's report. Such statements shall be made available to the Awarding Authority upon request.

(e) The Office of Inspector General, the Commissioner of Capital Asset Management and Maintenance and any other Awarding Authority shall enforce the provisions of this section. The Commissioner of Capital Asset Management and Maintenance may after providing an opportunity for the Inspector General and other interested parties to comment, promulgate pursuant to the provisions of chapter thirty A such rules, regulations and guidelines as are necessary to effectuate the purposes of this section. Such rules, regulations and guidelines may be applicable to all Awarding Authorities. A Contractor's failure to satisfy any of the requirements of this section may be grounds for debarment pursuant to section forty-four C of chapter one hundred and forty-nine.

(f) Records and statements required to be made, kept or filed under the provisions of this section shall not be public records as defined in section seven of chapter four and shall not be open to public inspection; provided, however, that such records and statements shall be made available pursuant to the provisions of clause (2) of paragraph (b).

# 1.1.9 CHAP. 149 MGL SECTION 25

Lodging, board and trade of public employees; statute part of employment contract

Every employee in public works shall lodge, board and trade where and with whom he elects, and no person or his agents or employees under contract with the Commonwealth, a County, City or Town, or with a Department, Board, Commission or Officer acting therefor, for the doing of public work shall directly or indirectly require, as a condition of employment therein, that the employee shall lodge, board or trade at a particular place or with a particular person. This section shall be made a part of the Contract for such employment.

#### 1.1.10 CHAP. 149 MGL SECTION 26

Public works; preference to veterans and citizens; wages

In the employment of mechanics and apprentices, teamsters, chauffeurs and laborers in the construction of public works by the commonwealth, or by a county, town, authority or district, or by persons contracting or subcontracting for such works, preference shall first be given to citizens of the commonwealth who have been residents of the commonwealth for at least six (6) months at the commencement of their employment who are veterans as defined in clause Forty-third of section 7 of chapter 4 and who are qualified to perform the work to which the employment relates and, within such preference, preference shall be given to service-disabled veterans; and secondly, to citizens of the commonwealth generally who have been residents of the commonwealth for at least six (6) months at the commencement of their employment, and if they cannot be obtained in sufficient numbers, then to citizens of the United States, and every contract for such work shall contain a provision to this effect. Each county, town or district in the construction of public works, or persons contracting or sub-contracting for such works, shall give preference to veterans and citizens who are residents of such county, town, authority or district and, within such preference, preference shall be given to service-disabled veterans. The rate per hour of the wages paid to said mechanics and apprentices, teamsters, chauffeurs and laborers in the construction of public works shall not be less than the rate or rates of wages to be determined by the commissioner as hereinafter provided; provided, that the wages paid to laborers employed on said works shall not be less than those paid to laborers in the municipal service of the town or towns where said works are being constructed; provided, further, that where the same public work is to be constructed in two (2) or more towns, the wages paid to laborers shall not be less than those paid to laborers in the municipal service of the town paying the highest rate; provided, further, that if, in any of the towns where the works are to be constructed, a wage rate or wage rates have been established in certain trades and occupations by collective agreements or understandings in the private construction industry between organized labor and employers, the rate or rates to be paid on said works shall not be less than the rates so established; provided further, that in towns where no such rate or rates have been so established, the wages paid to mechanics, teamsters, chauffeurs and laborers on public works, shall not be less than the wages paid to the employees in the same trades and occupations by private employers engaged in the construction industry. This section shall also apply to regular employees of the commonwealth or of a county, town, authority or district, when such employees are employed in the construction, addition to or alteration of public buildings for which special appropriations of more than one thousand dollars (\$1,000.00) are provided. Payments by employers to health and welfare plans, pension plans and supplementary unemployment benefit plans under collective bargaining agreements or understandings between organized labor and employers shall be included for the purpose of establishing minimum wage rates as herein provided.

Permanent and temporary laborers employed by the state department of highways and by the metropolitan district commission shall receive such salary or compensation as may be fixed under and in accordance with sections forty-five to fifty inclusive of chapter thirty.

1.1.11 CHAP. 149 MGL SECTION 34

Public contracts; stipulation as to hours and days of work; void contracts

Every contract, except for the purchase of material or supplies, involving the employment of laborers, workmen, mechanics, foremen or inspectors, to which the Commonwealth or any county or any town, subject to section thirty, is a party, shall contain a stipulation that no laborer, workman, mechanic, foreman or inspector working within the Commonwealth, in the employ of the Contractor, Subcontractor or other person doing or contracting to do the whole or a part of the work contemplated by the contract, shall be required or permitted to work more than eight (8) hours in any one day or more than forty eight (48) hours in any one (1) week, or more than six (6) days in any one (1) week, except in cases of emergency, or, in case any town subject to section thirty one is a party to such a contract, more than eight (8) hours in any one day, except as aforesaid; provided, that in contracts entered into by the Department of Highways for the construction or reconstruction of highways there may be inserted in said stipulation a provision that said Department, or any Contractor or Subcontractor for said Department, may employ laborers, workmen, mechanics, foremen and inspectors for more than eight (8) hours in any one (1) day in such construction or reconstruction when, in the opinion of the Commissioner, public necessity so requires. Every such contract not containing the aforesaid stipulation shall be null and void.

# 1.1.12 CHAP. 149 MGL SECTION 34A

Contracts for public works; workers' compensation insurance; breach of contract; enforcement and violation of statute

Every contract for the construction, alteration, maintenance, repair or demolition of, or addition to, any public building or other public works for the Commonwealth or any political subdivision thereof shall contain stipulations requiring that the Contractor shall, before commencing performance of such contract, provide by insurance for the payment of compensation and the furnishing of other benefits under chapter one hundred and fifty two to all persons to be employed under the contract, and that the Contractor shall continue such insurance in full force and effect during the term of the contract. No officer or agent contracting in behalf of the Commonwealth or any political subdivision thereof shall award such a contract until he has been furnished with sufficient proof of compliance with the aforesaid stipulations. Failure to provide and continue in force such insurance as aforesaid shall be deemed a material breach of the contract and shall operate as an immediate termination thereof. No cancellation of such insurance, whether by the insurer or by the insured, shall be valid unless written notice thereof is given by the party proposing cancellation to the other party and to the officer or agent who awarded the contract at least fifteen (15) days prior to the intended effective date thereof, which date shall be expressed in said notice. Notice of cancellation sent by the party proposing cancellation by registered mail, postage prepaid, with a return receipt of the addressee requested, shall be a sufficient notice. An affidavit of any officer, agent or employee of the insurer or of the insured, as the case may be, duly authorized for the purpose, that he has so sent such notice addressed as aforesaid shall be prima facie evidence of the sending thereof as aforesaid. This section shall apply to the legal representative, trustee in bankruptcy, receiver, assignee, trustee and the successor in interest of any such Contractor. The superior court shall have jurisdiction in equity to enforce this section.

Whoever violates any provision of this section shall be punished by a fine of not more than one hundred dollars (\$100.00) or by imprisonment for six 6) months, or both; and, in addition, any Contractor who violates any provision of this section shall be prohibited from contracting, directly or indirectly, with the Commonwealth or any political subdivision thereof, for the construction, alteration, demolition, maintenance or repair of, or addition to, any public works or public building for a period of two years from the date of conviction of said violation.

#### 1.1.13 CHAP. 149 MGL SECTION 34B

Contracts for public works; wages for reserve police officer

Every contract for the construction, alteration, maintenance, repair or demolition of, or addition to, any public works for the Commonwealth or any political subdivision thereof shall contain stipulations requiring that the Contractor shall pay to any reserve police officer employed by him in any City or Town the prevailing rate of wage paid to regular police officers in such City or Town.

# 1.1.14 CHAP.149 MGL SECTION 44A

Section forty-four A. (1) The words defined in this section shall have the meaning set forth below whenever they appear in sections forty-four A through forty-four H, inclusive, of this chapter unless indicated otherwise or unless the context in which they are used clearly requires a different meaning.

"Commissioner", means the commissioner of the division of capital asset management and maintenance or his designee.

"Public Agency" means a department, agency, board, commission, authority, or other instrumentality of the commonwealth or political subdivision of the commonwealth, or two or more subdivisions thereof but not including the Massachusetts Bay Transportation Authority;

"Responsible" means demonstrably possessing the skill, ability and integrity necessary to faithfully perform the work called for by a particular contract, based upon a determination of competent workmanship and financial soundness in accordance with the provisions of section forty-four D of this chapter;

"Eligible" means able to meet all requirements for bidders or offerors set forth in sections forty-four A through forty-four H of this chapter and not debarred from bidding under section forty-four C of this chapter or any other applicable law, and who shall certify that he is able to furnish labor that can work in harmony with all other elements of labor employed or to be employed on the work.

"Modular Building", a pre-designed building or units of a pre-designed building assembled and equipped with internal plumbing, electrical or similar systems prior to movement to the site where such units are attached to each other and such building is affixed to a foundation and connected to external utilities; or any portable structure with walls, a floor, and a roof, designed or used for the shelter of persons or property, transportable in one or more sections and affixed to a foundation and connected to external utilities.

"Procurement", buying, purchasing, or otherwise acquiring and installing a modular building, and all functions that pertain to the acquisition and installation of a modular building, including description of requirements, selection and solicitation of sources, preparation and award of contract, and all phases of contract administration.

"Proprietary environmental technology systems", systems, in the Town of Natick, including solid waste related equipment, supporting structures, and buildings, designed, manufactured, and produced under exclusive individual right to sell such product, pertaining to solid waste related environmental protection or remediation. Such systems shall include, but not be limited to, sequential, turnkey, construction management, design/build procurement, and the phasing of such procurement, including approval of design and construction stages as separate or combined phases.

(2)(A) (A) Every contract or procurement for the construction, reconstruction, installation, demolition, maintenance or repair of a building by a public agency estimated to cost less than \$10,000 shall be obtained through the exercise of sound business practices as defined in section 2 of chapter 30B. The public agency shall make and keep a record of each procurement that, at a minimum, shall include the name and address of the person from whom the services were procured. A public agency that utilizes a vendor on a statewide contract procured through the operational services division of the commonwealth, or a blanket contract procured by the public agency pursuant to this subsection, shall be deemed to have obtained the contract through sound business practices.

(B) Every contract for the construction, reconstruction, installation, demolition, maintenance or repair of any building estimated to cost not less than \$10,000 but not more than \$50,000 shall be awarded to the responsible person offering to perform the contract at the lowest price. The public agency shall make public notification of the contract and shall seek written responses from no fewer than 3 persons who customarily perform such work. The solicitation shall include a scope-of-work statement that defines the work to be performed and provides potential responders with sufficient information regarding the objectives and requirements of the public agency and the time period within which the work shall be completed. The public agency shall record the names and addresses of all persons from whom written responses were sought, the names of the persons submitting written responses and the date and amount of each written response. A public agency may utilize a vendor list established through a statewide contract procured through the operational services division to identify 1 or more of the persons from whom it will seek written responses for purposes of this paragraph.

A public agency may also procure a blanket contract to establish a listing of vendors in certain defined categories of work that are under contract to provide services for multiple individual tasks of not more than \$50,000 each, and from whom written responses will be sought. Any such blanket contract procured by the awarding authority shall be procured pursuant to either section 39M of chapter 30 or sections 44A to 44J, inclusive, of chapter 149 which are applicable to projects over \$50,000. For purposes of this paragraph, the term "public notification" shall include, but not be limited to, posting at least 2 weeks before the time specified in the notification for the receipt of responses, the contract and scope-of-work statement: (1) on the website of the public agency, (2) on the COMMBUYS system administered by the operational services division, (3) in the central register published pursuant to section 20A of chapter 9 and (4) in a conspicuous place in or near the primary office of the public agency; provided, however, that if the public agency obtains a minimum of 2 written responses from a vendor list established through a blanket contract or a statewide contract procured through the operational services division, and the lowest of those written responses is deemed acceptable to the public agency, public notification is not required.

(C) Every contract for the construction, reconstruction, installation, demolition, maintenance or repair of any building by a public agency estimated to cost more than \$50,000 but not more than \$150,000, except for a pumping station to be constructed as an integral part of a sewer construction or water construction project bid under the provisions of section 39M of chapter 30, shall be awarded to the lowest responsible and eligible bidder on the basis of competitive bids publicly opened and read in accordance with the procedure set forth in said section 39M of said chapter 30. The term "pumping station" as used in this section shall mean a building or other structure which houses solely pumps and appurtenant electrical and plumbing fixtures.

(D) Every contract for the construction, reconstruction, installation, demolition, maintenance or repair of any building by a public agency estimated to cost more than \$150,000, except for a pumping station to be constructed as an integral part of a sewer construction or water construction project bid under the provisions of section 39M of chapter 30, shall be awarded to the lowest responsible and eligible general bidder on the basis of competitive bids in accordance with the procedure set forth in section 44A to 44H, inclusive.

(E) When the general court has approved the use of an alternative mode of procurement of construction for a project pursuant to section seven E of chapter twenty-nine, the awarding authority responsible for procuring construction services for the project shall follow the policies and procedures of this section and of section forty-four B to 44H, inclusive, to the extent compatible with the mode of construction procurement selected.

(F) Notwithstanding paragraph (E), a public agency may undertake the procurement of modular buildings, in accordance with section forty-four E. A public agency may procure site work for modular buildings, including but not limited to, construction of foundations, installations, and attachment to external utilities, or any portion of site work, either in combination with the procurement of modular buildings pursuant to section 44E or on the basis of competitive bids pursuant to the paragraph (E). Notwithstanding the paragraph (E), a public agency may procure energy management services in accordance with section eleven C of chapter twenty-five A and regulations promulgated thereunder.

(3) The award of every such contract in connection with which approval by an officer, board or agency of the federal government is required shall be made within thirty days, Saturdays, Sundays and legal holidays excluded, after such approval; and the award of every contract subject to this section in connection with which approval by an officer, board or agency of the federal government is not required shall be made within thirty days, Saturdays, Sundays and legal holidays excluded, after the opening of the bids therefor. If the bidder selected as the general contractor fails to perform his agreement to execute a contract in accordance with the terms of his bid and furnish a performance bond and also a labor and materials or payment bond as stated in his bid in accordance with section forty-four E, an award shall be made to the next lowest responsible and eligible bidder, subject to the provisions of sections forty-four A to forty-four H, inclusive, of this chapter. The thirty-day time limit shall not be applicable to a second or subsequent award made after expiration of the time limit with the consent of said next lowest responsible and eligible bidder, and made because the original award made within the time limit was invalid, or because the bidder failed to execute the contract or to provide a performance bond and labor and materials or payment bond.

(4) In cases of extreme emergency, the awarding authority may, with the prior approval of the commissioner, award a contract for that portion of the work necessary to preserve the health or safety of persons or property or to alleviate an imminent security threat on the basis of such competitive bids or proposals as it can obtain in time to care for the extreme emergency and without public opening of the bids or proposals. Where the nature of the emergency prevents the awarding authority from obtaining the prior approval of the commissioner, the awarding authority may contract for the necessary work without said prior approval; provided, however, that the approval of the commissioner shall still be sought at the earliest possible time; and provided, further, that if the commissioner at that time fails to approve the emergency determination the awarding authority shall promptly cease all work for which the emergency determination was denied. In such cases, the contractor shall be entitled to payment for the fair value of the labor and materials furnished prior to cessation of the work. The commissioner shall maintain a record of all contracts awarded pursuant to this subsection, containing a description of the circumstances and the reasons for the commissioner's determination.

(5) (a) Notwithstanding the provisions of this section or any other general or special law to the contrary, a municipality may enter into a contract for proprietary environmental technology systems as defined in subsection (1) of this section without said contract being subject to the competitive bid process as set forth in sections thirty-eight A1/2 to thirty-eight O, inclusive, of chapter seven; this section and sections forty-four B to forty-four H, inclusive, of this chapter, and section thirty-nine M of chapter thirty; provided that the awarding authority meets the conditions set forth and receives the approvals required in paragraph (b) of this subsection.

(b) Prior to the issuance of any request for proposal with respect to the awarding of any contract pursuant to the provisions of paragraph (a) of this subsection, the awarding authority shall meet or obtain each of the following conditions or required approvals: (1) the municipality shall appoint qualified persons to conduct a thorough review of all available environmental technology, including both proprietary and non-proprietary environmental technology, and if the conclusion of this review is that a contract for proprietary environmental technology systems is in the public interest, such conclusion shall be supported by sound documented reasons in writing available for public inspection; (2) the city council, the board of selectmen, or the town meeting shall take a majority vote finding that it is in the public interest to enter into a contract for proprietary environmental technology systems, as defined in subsection (1) of this section, providing such vote is supported by the conclusion of the review conducted pursuant to condition (1); (3) both the attorney general and the commissioner of the department of environmental protection shall grant written approval: (4) said contract shall be subject to any limitation in the waiver of sections thirty-eight A1/2 to thirty-eight O, inclusive, of chapter seven, sections forty-four A to forty-four H of chapter one hundred and forty-nine, and section thirty-nine M of chapter thirty imposed by either the attorney general or the commissioner of the department of environmental protection as a condition for a grant of approval by said officers; and (5) every proprietary environmental technology systems contract shall be as compatible with sections thirty-eight A to thirty-eight O, inclusive, of chapter seven, sections forty-four A to forty-four H of chapter one hundred and fortynine, and section thirty-nine M of chapter thirty as is feasible for the procurement of the proprietary environmental technology systems chosen.

(G) Every contract by a state agency or state assisted contract for design, construction, reconstruction, installation, demolition, maintenance or repair shall set forth the participation goals of minority and women workers to be employed on each such contract and the processes and procedures to ensure compliance with those workforce participation goals, including reporting and enforcement provisions.

# 1.1.15 CHAP.149 MGL SECTION 44G(D)

(D) Every contract subject to section forty-four A shall include specifications for the installation of weather protection and shall require that the contractor shall install the same and that he shall furnish adequate heat in the area so protected during the months of November through March. Standards for such specifications shall be established by the commissioner or his designee.

#### TOWN OF NATICK, MASSACHUSETTS BOARD OF SELECTMEN

# CHANGE ORDER FORM

Original Contract Price	\$
Previous Change Orders #	\$
Present Contract Price	\$
This Change Order # Increase/Decrease	\$
Total Adjusted Contract Price	\$
This Change Order changes the time of completion by calendar Days.	
The extended completion date is	
This Change Order checked by Date	Engineer
This Change Order requested by	
This Change Order prepared by	
Engineer	
The undersigned agree to the terms of the Change Order.	
Contractor	Date
Owner	Date

Certification of Appropriation under M.G.L sufficient to cover the total cost of this Char	. c.44, §31C: Adequate funding in the amount nge Order is available.
Town Accountant	Date
Change Ore	der Form (continued)
Public Entity	
Project Number	Contract Number:
Change Order Number:	_
Contract Title:	
Owner's Name:	
Owner's Address:	
Contractor's Name:	
Contractor's Address:	
Description of Change	
Reason for Change	

#### NOTICE TO PROCEED

Dated \_\_\_\_\_, 20\_\_\_.

To:

(Contractor)

(Address)

You are hereby notified to commence Work in accordance with the Agreement dated <u>, 201</u>, on or before <u>, 201</u>. You are to substantially complete the work by July 15, 2019.

> OWNER: Town of Natick, Massachusetts Board of Selectmen

> > By

\_\_\_\_ (Authorized Signature)

Printed Name

Printed Title

# ACCEPTANCE OF NOTICE

Receipt of the above Notice to Proceed is hereby acknowledged by

this the \_\_\_\_\_ day of \_\_\_\_\_20\_\_.

\_\_\_\_\_

By \_\_\_\_\_(Authorized Signature)

Printed Name

Printed Title



CHARLES D. BAKER Governor

KARYN E. POLITO Lt. Governor

#### THE COMMONWEALTH OF MASSACHUSETTS EXECUTIVE OFFICE OF LABOR AND WORKFORCE DEVELOPMENT DEPARTMENT OF LABOR STANDARDS

#### **Prevailing Wage Rates**

As determined by the Director under the provisions of the Massachusetts General Laws, Chapter 149, Sections 26 to 27H ROSALIN ACOSTA Secretary WILLIAM D MCKINNEY Director

Awarding Authority:	Town of Natick		
<b>Contract Number:</b>		City/Town:	NATICK
<b>Description of Work:</b>	East Park Reconstruction in the Town of Natick, Massachusetts		
Job Location:	90 Oak Street, Natick, MA 01760		

Information about Prevailing Wage Schedules for Awarding Authorities and Contractors

• This wage schedule applies only to the specific project referenced at the top of this page and uniquely identified by the "Wage Request Number" on all pages of this schedule.

• An Awarding Authority must request an updated wage schedule from the Department of Labor Standards ("DLS") if it has not opened bids or selected a contractor within 90 days of the date of issuance of the wage schedule. For CM AT RISK projects (bid pursuant to G.L. c.149A), the earlier of: (a) the execution date of the GMP Amendment, or (b) the bid for the first construction scope of work must be within 90-days of the wage schedule issuance date.

• The wage schedule shall be incorporated in any advertisement or call for bids for the project as required by M.G.L. c. 149, § 27. The wage schedule shall be made a part of the contract awarded for the project. The wage schedule must be posted in a conspicuous place at the work site for the life of the project in accordance with M.G.L. c. 149 § 27. The wages listed on the wage schedule must be paid to employees performing construction work on the project whether they are employed by the prime contractor, a filed sub-bidder, or any sub-contractor.

• All apprentices working on the project are required to be registered with the Massachusetts Department of Labor Standards, Division of Apprentice Standards (DLS/DAS). Apprentice must keep his/her apprentice identification card on his/her person during all work hours on the project. An apprentice registered with DAS may be paid the lower apprentice wage rate at the applicable step as provided on the prevailing wage schedule. Any apprentice not registered with DLS/DAS regardless of whether or not they are registered with any other federal, state, local, or private agency must be paid the journeyworker's rate for the trade.

• The wage rates will remain in effect for the duration of the project, except in the case of multi-year public construction projects. For construction projects lasting longer than one year, awarding authorities must request an updated wage schedule. Awarding authorities are required to request these updates no later than two weeks before the anniversary of the date the contract was executed by the awarding authority and the general contractor. For multi-year CM AT RISK projects, awarding authority must request an annual update no later than two weeks before the anniversary date, determined as the earlier of: (a) the execution date of the GMP Amendment, or (b) the execution date of the first amendment to permit procurement of construction services. Contractors are required to obtain the wage schedules from awarding authorities, and to pay no less than these rates to covered workers. The annual update requirement is not applicable to 27F "rental of equipment" contracts.

• Every contractor or subcontractor which performs construction work on the project is required to submit weekly payroll reports and a Statement of Compliance directly to the awarding authority by mail or email and keep them on file for three years. Each weekly payroll report must contain: the employee's name, address, occupational classification, hours worked, and wages paid. Do not submit weekly payroll reports to DLS. A sample of a payroll reporting form may be obtained at http://www.mass.gov/dols/pw.

• Contractors with questions about the wage rates or classifications included on the wage schedule have an affirmative obligation to inquire with DLS at (617) 626-6953.

• Employees not receiving the prevailing wage rate set forth on the wage schedule may report the violation to the Fair Labor Division of the office of the Attorney General at (617) 727-3465.

• Failure of a contractor or subcontractor to pay the prevailing wage rates listed on the wage schedule to all employees who perform construction work on the project is a violation of the law and subjects the contractor or subcontractor to civil and

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
Construction (2 AXLE) DRIVER - EQUIPMENT		#== · · ·	di - a	¢10.00	<b>#0.00</b>	
(2 AXLE) DRIVER - EQUIPMENT TEAMSTERS JOINT COUNCIL NO. 10 ZONE B	12/01/2016	\$32.15	\$10.91	\$10.89	\$0.00	\$53.95
(3 AXLE) DRIVER - EQUIPMENT teamsters joint council no. 10 zone b	12/01/2016	\$32.22	\$10.91	\$10.89	\$0.00	\$54.02
(4 & 5 AXLE) DRIVER - EQUIPMENT TEAMSTERS JOINT COUNCIL NO. 10 ZONE B	12/01/2016	\$32.34	\$10.91	\$10.89	\$0.00	\$54.14
ADS/SUBMERSIBLE PILOT	08/01/2017	\$92.97	\$9.90	\$21.15	\$0.00	\$124.02
PILE DRIVER LOCAL 56 (ZONE 1)	08/01/2018	\$97.80	\$9.90	\$21.15	\$0.00	\$128.85
	08/01/2019	\$102.78	\$9.90	\$21.15	\$0.00	\$133.83
For apprentice rates see "Apprentice- PILE DRIVER"						
AIR TRACK OPERATOR	06/01/2018	\$34.00	\$7.70	\$14.02	\$0.00	\$55.72
LABORERS - ZONE 2	12/01/2018	\$34.84	\$7.70	\$14.02	\$0.00	\$56.56
	06/01/2019	\$35.71	\$7.70	\$14.02	\$0.00	\$57.43
	12/01/2019	\$36.57	\$7.70	\$14.02	\$0.00	\$58.29
	06/01/2020	\$37.46	\$7.70	\$14.02	\$0.00	\$59.18
	12/01/2020	\$38.35	\$7.70	\$14.02	\$0.00	\$60.07
	06/01/2021	\$39.27	\$7.70	\$14.02	\$0.00	\$60.99
For apprentice rates see "Apprentice- LABORER"	12/01/2021	\$40.18	\$7.70	\$14.02	\$0.00	\$61.90
ASBESTOS REMOVER - PIPE / MECH. EQUIPT.	06/01/2018	\$36.90	\$11.50	\$7.10	\$0.00	\$55.50
HEAT & FROST INSULATORS LOCAL 6 (BOSTON)	12/01/2018	\$37.90	\$11.50	\$7.10	\$0.00	\$56.50
	06/01/2019	\$38.90	\$11.50	\$7.10	\$0.00	\$57.50
	12/01/2019	\$39.90	\$11.50	\$7.10	\$0.00	\$58.50
	06/01/2020	\$40.90	\$11.50	\$7.10	\$0.00	\$59.50
	12/01/2020	\$41.90	\$11.50	\$7.10	\$0.00	\$60.50
ASPHALT RAKER	06/01/2018	\$33.50	\$7.70	\$14.02	\$0.00	\$55.22
LABORERS - ZONE 2	12/01/2018	\$34.34	\$7.70	\$14.02	\$0.00	\$56.06
	06/01/2019	\$35.21	\$7.70	\$14.02	\$0.00	\$56.93
	12/01/2019	\$36.07	\$7.70	\$14.02	\$0.00	\$57.79
	06/01/2020	\$36.96	\$7.70	\$14.02	\$0.00	\$58.68
	12/01/2020	\$37.85	\$7.70	\$14.02	\$0.00	\$59.57
	06/01/2021	\$38.77	\$7.70	\$14.02	\$0.00	\$60.49
	12/01/2021	\$39.68	\$7.70	\$14.02	\$0.00	\$61.40
For apprentice rates see "Apprentice- LABORER"						
ASPHALT/CONCRETE/CRUSHER PLANT-ON SITE OPERATING ENGINEERS LOCAL 4	12/01/2017	\$46.63	\$10.50	\$15.50	\$0.00	\$72.63
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
BACKHOE/FRONT-END LOADER OPERATING ENGINEERS LOCAL 4	12/01/2017	\$46.63	\$10.50	\$15.50	\$0.00	\$72.63
For appropriate rates see "Appropriate OPERATING ENGINEERS"						

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
BARCO-TYPE JUMPING TAMPER	06/01/2018	\$33.50	\$7.70	\$14.02	\$0.00	\$55.22
LABORERS - ZONE 2	12/01/2018	\$34.34	\$7.70	\$14.02	\$0.00	\$56.06
	06/01/2019	\$35.21	\$7.70	\$14.02	\$0.00	\$56.93
	12/01/2019	\$36.07	\$7.70	\$14.02	\$0.00	\$57.79
	06/01/2020	\$36.96	\$7.70	\$14.02	\$0.00	\$58.68
	12/01/2020	\$37.85	\$7.70	\$14.02	\$0.00	\$59.57
	06/01/2021	\$38.77	\$7.70	\$14.02	\$0.00	\$60.49
For apprentice rates see "Apprentice- LABORER"	12/01/2021	\$39.68	\$7.70	\$14.02	\$0.00	\$61.40
BLOCK PAVER, RAMMER / CURB SETTER	06/01/2018	\$34.00	\$7.70	\$14.02	\$0.00	\$55.72
LABORERS - ZONE 2	12/01/2018	\$34.84	\$7.70	\$14.02	\$0.00	\$56.56
	06/01/2019	\$35.71	\$7.70	\$14.02	\$0.00	\$57.43
	12/01/2019	\$36.57	\$7.70	\$14.02	\$0.00	\$58.29
	06/01/2020	\$37.46	\$7.70	\$14.02	\$0.00	\$59.18
	12/01/2020	\$38.35	\$7.70	\$14.02	\$0.00	\$60.07
	06/01/2021	\$39.27	\$7.70	\$14.02	\$0.00	\$60.99
	12/01/2021	\$40.18	\$7.70	\$14.02	\$0.00	\$61.90
For apprentice rates see "Apprentice- LABORER"						
BOILER MAKER BOILERMAKERS LOCAL 29	01/01/2017	\$42.92	\$6.97	\$16.21	\$0.00	\$66.10

Apprentice -	BOILERMAKER - Local 29
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Effecti	ive Date - 01/01/2	2017				Supplemental		
Step	percent	А	pprentice Base Wage	Health	Pension	Unemployment	Total Rat	te
1	65		\$27.90	\$6.97	\$10.54	\$0.00	\$45.4	1
2	65		\$27.90	\$6.97	\$10.54	\$0.00	\$45.4	1
3	70		\$30.04	\$6.97	\$11.35	\$0.00	\$48.3	6
4	75		\$32.19	\$6.97	\$12.16	\$0.00	\$51.3	2
5	80		\$34.34	\$6.97	\$12.97	\$0.00	\$54.2	8
6	85		\$36.48	\$6.97	\$13.78	\$0.00	\$57.2	3
7	90		\$38.63	\$6.97	\$14.59	\$0.00	\$60.1	9
8	95		\$40.77	\$6.97	\$15.40	\$0.00	\$63.1	4
Notes:								
Appre	ntice to Journeywo	rker Ratio:1:5						
BRICK/STONE/ARTIF	FICIAL MASONRY	(INCL. MASONRY	03/01/2018	\$49.96	\$10.75	\$19.43	\$0.00	\$80.14
VATERPROOFING) RICKLAYERS LOCAL 3 (LC	) WFLL)		08/01/2018	\$51.31	\$10.75	\$19.56	\$0.00	\$81.62
			02/01/2019	\$51.91	\$10.75	\$19.56	\$0.00	\$82.22
			08/01/2019	\$53.26	\$10.75	\$19.70	\$0.00	\$83.71
			02/01/2020	\$53.86	\$10.75	\$19.70	\$0.00	\$84.31
			08/01/2020	\$55.21	\$10.75	\$19.85	\$0.00	\$85.81
			02/01/2021	\$55.81	\$10.75	\$19.85	\$0.00	\$86.41
			08/01/2021	\$57.21	\$10.75	\$20.01	\$0.00	\$87.97
			02/01/2022		\$10.75	\$20.01	\$0.00	\$88.55
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	••	ve Date - 03/01/2018				Supplemental		
	Step	percent	Apprentice Base Wage	Health	Pension	Unemployment	Total Rate	
	1	50	\$24.98	\$10.75	\$19.43	\$0.00	\$55.16	
	2	60	\$29.98	\$10.75	\$19.43	\$0.00	\$60.16	
	3	70	\$34.97	\$10.75	\$19.43	\$0.00	\$65.15	
	4	80	\$39.97	\$10.75	\$19.43	\$0.00	\$70.15	
	5	90	\$44.96	\$10.75	\$19.43	\$0.00	\$75.14	
	Effecti	ve Date - 08/01/2018				Supplemental		
	Step	percent	Apprentice Base Wage	Health	Pension	Unemployment	Total Rate	
	1	50	\$25.66	\$10.75	\$19.56	\$0.00	\$55.97	
	2	60	\$30.79	\$10.75	\$19.56	\$0.00	\$61.10	
	3	70	\$35.92	\$10.75	\$19.56	\$0.00	\$66.23	
	4	80	\$41.05	\$10.75	\$19.56	\$0.00	\$71.36	
	5	90	\$46.18	\$10.75	\$19.56	\$0.00	\$76.49	
	Notes:							
	Ì							
	Appre	ntice to Journeyworker Ratio:1:	5					
PERATING ENG	INEERS LO		12/01/2017	7 \$46.17	\$10.50	\$15.50	\$0.00	\$72.17
		Apprentice- OPERATING ENGINEERS"						
AISSON & U Borers - Foui		INNING BOTTOM MAN AND MARINE	06/01/2018	8 \$39.10	\$7.70	\$15.40	\$0.00	\$62.20
			12/01/2018	8 \$40.05	\$7.70	\$15.40	\$0.00	\$63.15
			06/01/2019	9 \$41.05	\$7.70	\$15.40	\$0.00	\$64.15
			12/01/2019		\$7.70	\$15.40	\$0.00	\$65.15
			06/01/2020	\$43.04	\$7.70	\$15.40	\$0.00	\$66.14
			12/01/2020	) \$44.02	\$7.70	\$15.40	\$0.00	\$67.12
			06/01/2021	\$45.04	\$7.70	\$15.40	\$0.00	\$68.14
E-max (			12/01/2021	\$46.05	\$7.70	\$15.40	\$0.00	\$69.15
		Apprentice- LABORER"				¢15.40		
BORERS - FOU		INNING LABORER <i>and marine</i>	06/01/2018			\$15.40	\$0.00	\$61.05
			12/01/2018			\$15.40	\$0.00	\$62.00
			06/01/2019			\$15.40	\$0.00	\$63.00
			12/01/2019			\$15.40	\$0.00	\$64.00
			06/01/2020			\$15.40	\$0.00	\$64.99
			12/01/2020	\$42.87	\$7.70	\$15.40	\$0.00	\$65.97
			06/01/2021	\$43.89	\$7.70	\$15.40	\$0.00	\$66.99
For apprentice	rates see '	Apprentice- LABORER"	12/01/2021	\$44.90	\$7.70	\$15.40	\$0.00	\$68.00
appronuce		rr						

Apprentice -	BRICK/PLASTER/CEMENT MASON - Local 3 Lowell
Effective Date	03/01/2018

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
CAISSON & UNDERPINNING TOP MAN	06/01/2018	\$37.95	\$7.70	\$15.40	\$0.00	\$61.05
LABORERS - FOUNDATION AND MARINE	12/01/2018	\$38.90	\$7.70	\$15.40	\$0.00	\$62.00
	06/01/2019	\$39.90	\$7.70	\$15.40	\$0.00	\$63.00
	12/01/2019	\$40.90	\$7.70	\$15.40	\$0.00	\$64.00
	06/01/2020	\$41.89	\$7.70	\$15.40	\$0.00	\$64.99
	12/01/2020	\$42.87	\$7.70	\$15.40	\$0.00	\$65.97
	06/01/2021	\$43.89	\$7.70	\$15.40	\$0.00	\$66.99
	12/01/2021	\$44.90	\$7.70	\$15.40	\$0.00	\$68.00
For apprentice rates see "Apprentice- LABORER"						
CARBIDE CORE DRILL OPERATOR	06/01/2018	\$33.50	\$7.70	\$14.02	\$0.00	\$55.22
LABORERS - ZONE 2	12/01/2018	\$34.34	\$7.70	\$14.02	\$0.00	\$56.06
	06/01/2019	\$35.21	\$7.70	\$14.02	\$0.00	\$56.93
	12/01/2019	\$36.07	\$7.70	\$14.02	\$0.00	\$57.79
	06/01/2020	\$36.96	\$7.70	\$14.02	\$0.00	\$58.68
	12/01/2020	\$37.85	\$7.70	\$14.02	\$0.00	\$59.57
	06/01/2021	\$38.77	\$7.70	\$14.02	\$0.00	\$60.49
	12/01/2021	\$39.68	\$7.70	\$14.02	\$0.00	\$61.40
For apprentice rates see "Apprentice- LABORER"						
CARPENTER	03/01/2018	\$40.28	\$9.90	\$17.50	\$0.00	\$67.68
CARPENTERS - ZONE 2 (Eastern Massachusetts)	09/01/2018	\$41.32	\$9.90	\$17.50	\$0.00	\$68.72
	03/01/2019	\$42.35	\$9.90	\$17.50	\$0.00	\$69.75

Effect	ive Date - 03/01/2018	3			Supplemental	
Step	percent	Apprentice Base Wage	Health	Pension	Unemployment	Total Rate
1	50	\$20.14	\$9.90	\$1.73	\$0.00	\$31.77
2	60	\$24.17	\$9.90	\$1.73	\$0.00	\$35.80
3	70	\$28.20	\$9.90	\$12.31	\$0.00	\$50.41
4	75	\$30.21	\$9.90	\$12.31	\$0.00	\$52.42
5	80	\$32.22	\$9.90	\$14.04	\$0.00	\$56.16
6	80	\$32.22	\$9.90	\$14.04	\$0.00	\$56.16
7	90	\$36.25	\$9.90	\$15.77	\$0.00	\$61.92
8	90	\$36.25	\$9.90	\$15.77	\$0.00	\$61.92

# Apprentice - CARPENTER - Zone 2 Eastern MA

#### Effective Date - 09/01/2018

	Effecti	ive Date - 0	9/01/2018			Supplemental		
	Step	percent	Apprentice Base Wage	Health	Pension	Unemployment	Total Rat	e
	1	50	\$20.66	\$9.90	\$1.73	\$0.00	\$32.2	9
	2	60	\$24.79	\$9.90	\$1.73	\$0.00	\$36.4	2
	3	70	\$28.92	\$9.90	\$12.31	\$0.00	\$51.1	3
	4	75	\$30.99	\$9.90	\$12.31	\$0.00	\$53.2	0
	5	80	\$33.06	\$9.90	\$14.04	\$0.00	\$57.0	0
	6	80	\$33.06	\$9.90	\$14.04	\$0.00	\$57.0	0
	7	90	\$37.19	\$9.90	\$15.77	\$0.00	\$62.8	6
	8	90	\$37.19	\$9.90	\$15.77	\$0.00	\$62.8	6
	Notes:							
			d After 10/1/17; 45/45/55/55/70/70/80/80 99.76/ 3&4 \$35.45/ 5&6 \$52.14/ 7&8 \$57.89					
	Appre	ntice to Jour	neyworker Ratio:1:5					
CARPENTER			04/01/2018	8 \$26.67	\$7.07	\$7.86	\$0.00	\$41.60
CARPENTERS -ZO	NE 2 (Woo	od Frame)	10/01/2018	8 \$27.09	\$7.07	\$7.86	\$0.00	\$42.02
			04/01/2019	\$27.52	\$7.07	\$7.86	\$0.00	\$42.45
			10/01/2019	\$27.95	\$7.07	\$7.86	\$0.00	\$42.88

As of 9/1/09 Carpentry work on wood-frame WEATHERIZATION projects shall be paid the WOOD FRAME CARPENTER rate.

Effective Date -		04/01/2018		Supplemental			
Step	percent		Apprentice Base Wage	Health	Pension	Unemployment	Total Rate
1	60		\$16.00	\$7.07	\$0.00	\$0.00	\$23.07
2	60		\$16.00	\$7.07	\$0.00	\$0.00	\$23.07
3	65		\$17.34	\$7.07	\$7.86	\$0.00	\$32.27
4	70		\$18.67	\$7.07	\$7.86	\$0.00	\$33.60
5	75		\$20.00	\$7.07	\$7.86	\$0.00	\$34.93
6	80		\$21.34	\$7.07	\$7.86	\$0.00	\$36.27
7	85		\$22.67	\$7.07	\$7.86	\$0.00	\$37.60
8	90		\$24.00	\$7.07	\$7.86	\$0.00	\$38.93

# Apprentice - CARPENTER (Wood Frame) - Zone 2

Effective Date -	10/01/2018

Effecti	<b>ve Date -</b> 10/01/2018		Suppl	Supplemental			
Step	percent	Apprentice Base Wage	Health Pension		Unemployment	Total Rate	
1	60	\$16.25	\$7.07	\$0.00	\$0.00	\$23.32	
2	60	\$16.25	\$7.07	\$0.00	\$0.00	\$23.32	
3	65	\$17.61	\$7.07	\$7.86	\$0.00	\$32.54	
4	70	\$18.96	\$7.07	\$7.86	\$0.00	\$33.89	
5	75	\$20.32	\$7.07	\$7.86	\$0.00	\$35.25	
6	80	\$21.67	\$7.07	\$7.86	\$0.00	\$36.60	
7	85	\$23.03	\$7.07	\$7.86	\$0.00	\$37.96	
8	90	\$24.38	\$7.07	\$7.86	\$0.00	\$39.31	
Notes:	Notes: % Indentured After 10/1/17; 45/45/55/55/70/ Step 1&2 \$19.07/ 3&4 \$26.49/ 5&6 \$33.60/ 7						
Appre	ntice to Journeyworker Ratio:1:5						
CARPENTER WOOD I CARPENTERS -ZONE 2 (Woo	06/01/2016	\$25.32	\$9.80	\$16.82	\$0.00	\$51.94	
CEMENT MASONRY/	01/01/2018	\$41.67	\$12.35	\$22.41	\$0.30	\$76.73	
BRICKLAYERS LOCAL 3 (LO	WELL)	07/01/2018	\$42.52	\$12.42	\$22.41	\$0.30	\$77.65
		01/01/2019	\$43.76	\$12.42	\$22.41	\$0.30	\$78.89
		07/01/2019	\$44.64	\$12.42	\$22.41	\$0.30	\$79.77
		01/01/2020	\$45.88	\$12.42	\$22.41	\$0.30	\$81.01

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	Appre Effecti	ve Date - 01/01/2018				Supplemental		
	Step	percent	Apprentice Base Wage	Health	Pension	Unemployment	Total Rate	e
	1	50	\$20.84	\$12.35	\$15.41	\$0.00	\$48.60	)
	2	60	\$25.00	\$12.35	\$17.41	\$0.30	\$55.06	ó
	3	65	\$27.09	\$12.35	\$18.41	\$0.30	\$58.15	5
	4	70	\$29.17	\$12.35	\$19.41	\$0.30	\$61.23	;
	5	75	\$31.25	\$12.35	\$20.41	\$0.30	\$64.31	
	6	80	\$33.34	\$12.35	\$21.41	\$0.30	\$67.40	)
	7	90	\$37.50	\$12.35	\$22.41	\$0.30	\$72.56	Ó
	Effect	ve Date - 07/01/2018				Supplemental		
	Step	percent	Apprentice Base Wage	Health	Pension	Unemployment	Total Rate	e
	1	50	\$21.26	\$12.42	\$15.41	\$0.00	\$49.09	)
	2	60	\$25.51	\$12.42	\$17.41	\$0.30	\$55.64	Ļ
	3	65	\$27.64	\$12.42	\$18.41	\$0.30	\$58.77	7
	4	70	\$29.76	\$12.42	\$19.41	\$0.30	\$61.89	)
	5	75	\$31.89	\$12.42	\$20.41	\$0.30	\$65.02	2
	6	80	\$34.02	\$12.42	\$21.41	\$0.30	\$68.15	5
	7	90	\$38.27	\$12.42	\$22.41	\$0.30	\$73.40	)
	Notes:	Steps 3,4 are 500 hrs. All other steps a	re 1,000 hrs.				   	
	Appre	ntice to Journeyworker Ratio:1:3						
IAIN SAW (		TOR	06/01/2018	3 \$33.50	\$7.70	\$14.02	\$0.00	\$55.22
BORERS - ZONE	E 2		12/01/2018	\$34.34	\$7.70	\$14.02	\$0.00	\$56.06
			06/01/2019	\$35.21	\$7.70	\$14.02	\$0.00	\$56.93
								<b>*</b> *
			12/01/2019	\$36.07	\$7.70	\$14.02	\$0.00	\$57.79
			12/01/2019 06/01/2020		\$7.70 \$7.70	\$14.02 \$14.02	\$0.00 \$0.00	
				\$36.96				\$58.68
			06/01/2020	) \$36.96 ) \$37.85	\$7.70	\$14.02	\$0.00	\$58.68 \$59.57
			06/01/2020 12/01/2020	) \$36.96 ) \$37.85 1 \$38.77	\$7.70 \$7.70	\$14.02 \$14.02	\$0.00 \$0.00	\$58.68 \$59.57 \$60.49
		'Apprentice- LABORER''	06/01/2020 12/01/2020 06/01/2021 12/01/2021	) \$36.96 ) \$37.85 1 \$38.77	\$7.70 \$7.70 \$7.70	\$14.02 \$14.02 \$14.02	\$0.00 \$0.00 \$0.00	\$58.68 \$59.57 \$60.49
	.S/SLUR	RY BUCKETS/HEADING MACHINE	06/01/2020 12/01/2020 06/01/2021 12/01/2021	) \$36.96 ) \$37.85 1 \$38.77 1 \$39.68	\$7.70 \$7.70 \$7.70	\$14.02 \$14.02 \$14.02	\$0.00 \$0.00 \$0.00	\$57.79 \$58.68 \$59.57 \$60.49 \$61.40 \$73.63
AM SHELL	S/SLUR	RY BUCKETS/HEADING MACHINE	06/01/2020 12/01/2020 06/01/202 12/01/202	) \$36.96 ) \$37.85 1 \$38.77 1 \$39.68	\$7.70 \$7.70 \$7.70 \$7.70	\$14.02 \$14.02 \$14.02 \$14.02	\$0.00 \$0.00 \$0.00 \$0.00	\$58.68 \$59.57 \$60.49 \$61.40

Apprentice - CEMENT MASONRY/PLASTERING - Lowell

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

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#### Classification

DELEADER (BRIDGE) PAINTERS LOCAL 35 - ZONE 2

Effec	tive Date Bas	e Wage H	lealth P	'ension	upplemental nemployment	<b>Fotal Rate</b>
01/0	01/2018 \$	49.66	\$8.10	\$19.55	\$0.00	\$77.31
07/0	01/2018 \$	50.01	\$8.15	\$20.15	\$0.00	\$78.31
01/0	01/2019 \$	50.36	\$8.15	\$20.85	\$0.00	\$79.36
07/0	01/2019 \$	51.46	\$8.15	\$20.85	\$0.00	\$80.46
01/0	01/2020 \$	52.56	\$8.15	\$20.85	\$0.00	\$81.56
07/0	1/2020 \$	53.66	\$8.15	\$20.85	\$0.00	\$82.66
01/0	01/2021 \$	54.76	\$8.15	\$20.85	\$0.00	\$83.76

# Apprentice - PAINTER Local 35 - BRIDGES/TANKS Effective Date - 01/01/2018

Effect	ive Date - 0	1/01/2018				Supplemental	
Step	percent		Apprentice Base Wage	Health	Pension	Unemployment	Total Rate
1	50		\$24.83	\$8.10	\$0.00	\$0.00	\$32.93
2	55		\$27.31	\$8.10	\$5.06	\$0.00	\$40.47
3	60		\$29.80	\$8.10	\$5.52	\$0.00	\$43.42
4	65		\$32.28	\$8.10	\$5.98	\$0.00	\$46.36
5	70		\$34.76	\$8.10	\$16.79	\$0.00	\$59.65
6	75		\$37.25	\$8.10	\$17.25	\$0.00	\$62.60
7	80		\$39.73	\$8.10	\$17.71	\$0.00	\$65.54
8	90		\$44.69	\$8.10	\$18.63	\$0.00	\$71.42

#### 07/01/2010

Effecti	<b>ve Date -</b> 07/01/2018				Supplemental		
Step	percent	Apprentice Base Wage	Health	Pension	Unemployment	Total Rate	
1	50	\$25.01	\$8.15	\$0.00	\$0.00	\$33.16	
2	55	\$27.51	\$8.15	\$5.34	\$0.00	\$41.00	
3	60	\$30.01	\$8.15	\$5.82	\$0.00	\$43.98	
4	65	\$32.51	\$8.15	\$6.31	\$0.00	\$46.97	
5	70	\$35.01	\$8.15	\$17.24	\$0.00	\$60.40	
6	75	\$37.51	\$8.15	\$17.73	\$0.00	\$63.39	
7	80	\$40.01	\$8.15	\$18.21	\$0.00	\$66.37	
8	90	\$45.01	\$8.15	\$19.18	\$0.00	\$72.34	
Notes:							
	Steps are 750 hrs.						
Appre	ntice to Journeyworker Ratio:1:1						
DEMO: ADZEMAN		06/01/2018	\$38.15	\$7.70	\$15.20	\$0.00	\$61.05
LABORERS - ZONE 2		12/01/2018	\$\$39.10	\$7.70	\$15.20	\$0.00	\$62.00
		06/01/2019	\$40.10	\$7.70	\$15.20	\$0.00	\$63.00
		12/01/2019	\$41.10	\$7.70	\$15.20	\$0.00	\$64.00
For apprentice rates see "	Apprentice- LABORER"						
DEMO: BACKHOE/LO LABORERS - ZONE 2	DADER/HAMMER OPERATOR	06/01/2018	\$39.15	\$7.70	\$15.20	\$0.00	\$62.05
LADOKEKS - ZONE 2		12/01/2018	\$40.10	\$7.70	\$15.20	\$0.00	\$63.00
		06/01/2019	\$41.10	\$7.70	\$15.20	\$0.00	\$64.00
		12/01/2019	\$42.10	\$7.70	\$15.20	\$0.00	\$65.00

For apprentice rates see "Apprentice- LABORER"

**Issue Date:** 06/25/2018

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
DEMO: BURNERS	06/01/2018	\$38.90	\$7.70	\$15.20	\$0.00	\$61.80
LABORERS - ZONE 2	12/01/2018	\$39.85	\$7.70	\$15.20	\$0.00	\$62.75
	06/01/2019	\$40.85	\$7.70	\$15.20	\$0.00	\$63.75
	12/01/2019	\$41.85	\$7.70	\$15.20	\$0.00	\$64.75
For apprentice rates see "Apprentice- LABORER"						
DEMO: CONCRETE CUTTER/SAWYER LABORERS - ZONE 2	06/01/2018	\$39.15	\$7.70	\$15.20	\$0.00	\$62.05
	12/01/2018	\$40.10	\$7.70	\$15.20	\$0.00	\$63.00
	06/01/2019	\$41.10	\$7.70	\$15.20	\$0.00	\$64.00
For apprentice rates see "Apprentice- LABORER"	12/01/2019	\$42.10	\$7.70	\$15.20	\$0.00	\$65.00
DEMO: JACKHAMMER OPERATOR	0.6/04/2004.0	<b>#2</b> 0.00	<b>*- - ^</b>	¢15.00	<u> </u>	<b>.</b>
LABORERS - ZONE 2	06/01/2018	\$38.90	\$7.70	\$15.20	\$0.00	\$61.80
	12/01/2018	\$39.85	\$7.70	\$15.20	\$0.00	\$62.75
	06/01/2019	\$40.85	\$7.70	\$15.20	\$0.00	\$63.75
For apprentice rates see "Apprentice- LABORER"	12/01/2019	\$41.85	\$7.70	\$15.20	\$0.00	\$64.75
DEMO: WRECKING LABORER	06/01/2018	\$38.15	\$7.70	\$15.20	\$0.00	\$61.05
LABORERS - ZONE 2				\$15.20	\$0.00 \$0.00	
	12/01/2018	\$39.10 \$40.10	\$7.70			\$62.00
	06/01/2019	\$40.10	\$7.70	\$15.20	\$0.00 \$0.00	\$63.00
For apprentice rates see "Apprentice- LABORER"	12/01/2019	\$41.10	\$7.70	\$15.20	\$0.00	\$64.00
DIRECTIONAL DRILL MACHINE OPERATOR OPERATING ENGINEERS LOCAL 4	12/01/2017	\$46.17	\$10.50	\$15.50	\$0.00	\$72.17
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
DIVER	08/01/2017	\$61.98	\$9.90	\$21.15	\$0.00	\$93.03
PILE DRIVER LOCAL 56 (ZONE 1)	08/01/2018	\$65.20	\$9.90	\$21.15	\$0.00	\$96.25
	08/01/2019	\$68.52	\$9.90	\$21.15	\$0.00	\$99.57
For apprentice rates see "Apprentice- PILE DRIVER"						
DIVER TENDER PILE DRIVER LOCAL 56 (ZONE 1)	08/01/2017	\$44.27	\$9.90	\$21.15	\$0.00	\$75.32
	08/01/2018	\$46.57	\$9.90	\$21.15	\$0.00	\$77.62
For apprentice rates see "Apprentice- PILE DRIVER"	08/01/2019	\$48.94	\$9.90	\$21.15	\$0.00	\$79.99
DIVER TENDER (EFFLUENT)	09/01/2017	\$66.41	\$0.00	\$21.15	\$0.00	¢07.46
PILE DRIVER LOCAL 56 (ZONE 1)	08/01/2017	\$66.41	\$9.90			\$97.46
	08/01/2018	\$69.86	\$9.90	\$21.15	\$0.00	\$100.91
For apprentice rates see "Apprentice- PILE DRIVER"	08/01/2019	\$73.41	\$9.90	\$21.15	\$0.00	\$104.46
DIVER/SLURRY (EFFLUENT)	08/01/2017	\$92.97	\$9.90	\$21.15	\$0.00	\$124.02
PILE DRIVER LOCAL 56 (ZONE 1)	08/01/2018	\$97.80	\$9.90	\$21.15	\$0.00	\$128.85
	08/01/2019	\$102.78	\$9.90	\$21.15	\$0.00	\$133.83
For apprentice rates see "Apprentice- PILE DRIVER"	00/01/2019	\$102.70	ψγ.90	+		<i>Q100.00</i>
DRAWBRIDGE OPERATOR (Construction)	03/01/2018	\$50.15	\$13.00	\$17.85	\$0.00	\$81.00
ELECTRICIANS LOCAL 103	09/01/2018	\$51.34	\$13.00	\$17.89	\$0.00	\$82.23
	03/01/2019	\$52.53	\$13.00	\$17.93	\$0.00	\$83.46
For apprentice rates see "Apprentice- ELECTRICIAN"						
ELECTRICIAN	03/01/2018	\$50.15	\$13.00	\$17.85	\$0.00	\$81.00
ELECTRICIANS LOCAL 103	09/01/2018	\$51.34	\$13.00	\$17.89	\$0.00	\$82.23
	03/01/2019	\$52.53	\$13.00	\$17.93	\$0.00	\$83.46

Effect	ive Date -	03/01/2018				Supplemental	
Step	percent		Apprentice Base Wage	Health	Pension	Unemployment	Total Rate
1	40		\$20.06	\$13.00	\$0.60	\$0.00	\$33.66
2	40		\$20.06	\$13.00	\$0.60	\$0.00	\$33.66
3	45		\$22.57	\$13.00	\$13.61	\$0.00	\$49.18
4	45		\$22.57	\$13.00	\$13.61	\$0.00	\$49.18
5	50		\$25.08	\$13.00	\$13.99	\$0.00	\$52.07
6	55		\$27.58	\$13.00	\$14.38	\$0.00	\$54.96
7	60		\$30.09	\$13.00	\$14.76	\$0.00	\$57.85
8	65		\$32.60	\$13.00	\$15.15	\$0.00	\$60.75
9	70		\$35.11	\$13.00	\$15.53	\$0.00	\$63.64
10	75		\$37.61	\$13.00	\$15.93	\$0.00	\$66.54

# Apprentice - ELECTRICIAN - Local 103

#### **Effective Date -** 09/01/2018

Effecti	ive Date - 09/	01/2018			Supplemental		
Step	percent	Apprentice Ba	se Wage Healtl	n Pension	Unemployment	Total Rate	
1	40	\$20	.54 \$13.00	\$0.62	\$0.00	\$34.16	
2	40	\$20	.54 \$13.00	\$0.62	\$0.00	\$34.16	
3	45	\$23	.10 \$13.00	\$13.62	\$0.00	\$49.72	
4	45	\$23	.10 \$13.00	\$13.62	\$0.00	\$49.72	
5	50	\$25	.67 \$13.00	\$14.01	\$0.00	\$52.68	
6	55	\$28	.24 \$13.00	\$14.40	\$0.00	\$55.64	
7	60	\$30	.80 \$13.00	\$14.78	\$0.00	\$58.58	
8	65	\$33	.37 \$13.00	\$15.17	\$0.00	\$61.54	
9	70	\$35	.94 \$13.00	\$15.56	\$0.00	\$64.50	
10	75	\$38	.51 \$13.00	\$15.96	\$0.00	\$67.47	

#### Notes: :

App Prior 1/1/03; 30/35/40/45/50/55/65/70/75/80

#### Apprentice to Journeyworker Ratio:2:3\*\*\*

ELEVATOR CONSTRUCTOR	01/01/2018	\$57.62	\$15.43	\$16.61	\$0.00	\$89.66
ELEVATOR CONSTRUCTORS LOCAL 4	01/01/2019	\$59.47	\$15.58	\$17.51	\$0.00	\$92.56
	01/01/2020	\$61.42	\$15.73	\$18.41	\$0.00	\$95.56
	01/01/2021	\$63.47	\$15.88	\$19.31	\$0.00	\$98.66
	01/01/2022	\$65.62	\$16.03	\$20.21	\$0.00	\$101.86

Effect	ive Date -	01/01/2018				Supplemental		
Step	percent		Apprentice Base Wage	Health	Pension	Unemployment	Total Rate	
1	50		\$28.81	\$15.43	\$0.00	\$0.00	\$44.24	
2	55		\$31.69	\$15.43	\$16.61	\$0.00	\$63.73	
3	65		\$37.45	\$15.43	\$16.61	\$0.00	\$69.49	
4	70		\$40.33	\$15.43	\$16.61	\$0.00	\$72.37	
5	80		\$46.10	\$15.43	\$16.61	\$0.00	\$78.14	
Effect	ive Date -	01/01/2019				Supplemental		
Step	percent		Apprentice Base Wage	Health	Pension	Unemployment	Total Rate	
1	50		\$29.74	\$15.58	\$0.00	\$0.00	\$45.32	
2	55		\$32.71	\$15.58	\$17.51	\$0.00	\$65.80	
3	65		\$38.66	\$15.58	\$17.51	\$0.00	\$71.75	
4	70		\$41.63	\$15.58	\$17.51	\$0.00	\$74.72	
5	80		\$47.58	\$15.58	\$17.51	\$0.00	\$80.67	
Notes:								
	Steps 1-2	are 6 mos.; Steps 3-5 are 1 y	ear					
		urneyworker Ratio:1:1	· ·					
EVATOR CONSTR EVATOR CONSTRUCTOR		ELPER	01/01/2018	8 \$40.3	3 \$15.43	\$16.61	\$0.00	\$72.37
	b Locale (		01/01/2019	9 \$41.6	3 \$15.58	\$17.51	\$0.00	\$74.72
			01/01/2020	\$42.9	9 \$15.73	\$18.41	\$0.00	\$77.13
			01/01/2021	l \$44.4	3 \$15.88	\$19.31	\$0.00	\$79.62
For opprontice rotes and	"Annuantica	ELEVATOR CONSTRUCTOR"	01/01/2022	2 \$45.9	3 \$16.03	\$20.21	\$0.00	\$82.17
NCE & GUARD RA		ELEVATOR CONSTRUCTOR"	0.6/01/2019			¢14.02	¢0.00	
BORERS - ZONE 2	IL LRECT	UK	06/01/2018			\$14.02 \$14.02	\$0.00 \$0.00	\$55.22
			12/01/2018			\$14.02 \$14.02	\$0.00 \$0.00	\$56.06
			06/01/2019			\$14.02 \$14.02	\$0.00	\$56.93 \$57.79
			06/01/2019			\$14.02	\$0.00	\$58.68
			12/01/2020			\$14.02 \$14.02	\$0.00	\$58.68 \$59.57
			06/01/202			\$14.02 \$14.02	\$0.00	\$59.57 \$60.49
			12/01/2021			\$14.02	\$0.00	\$61.49
For apprentice rates see	"Apprentice- L	ABORER"	12/01/202	φ57.0	φ1.10	ψ11.02	<i>40.00</i>	ψ01. <del>1</del> 0
ELD ENG.INST.PER		G,SITE,HVY/HWY	05/01/2018	8 \$42.84	4 \$10.50	\$15.50	\$0.00	\$68.84
For apprentice rates see	"Apprentice- C	DPERATING ENGINEERS"						
ELD ENG.PARTY C		OG,SITE,HVY/HWY	05/01/2018	8 \$44.3	1 \$10.50	\$15.50	\$0.00	\$70.31
For apprentice rates see	"Apprentice- C	OPERATING ENGINEERS"						
ELD ENG.ROD PER ERATING ENGINEERS L		G,SITE,HVY/HWY	05/01/2018	8 \$22.5	1 \$10.50	\$15.50	\$0.00	\$48.51
		<b>DPERATING ENGINEERS</b> "						

### Apprentice - ELEVATOR CONSTRUCTOR - Local 4

**Issue Date:** 06/25/2018

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Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
FIRE ALARM INSTALLER	03/01/2018	\$50.15	\$13.00	\$17.85	\$0.00	\$81.00
ELECTRICIANS LOCAL 103	09/01/2018	\$51.34	\$13.00	\$17.89	\$0.00	\$82.23
For apprentice rates see "Apprentice- ELECTRICIAN"	03/01/2019	\$52.53	\$13.00	\$17.93	\$0.00	\$83.46
FIRE ALARM REPAIR / MAINTENANCE	03/01/2018	\$37.61	\$13.00	\$15.93	\$0.00	\$66.54
/ COMMISSIONING <i>electricians</i>	09/01/2018	\$38.51	\$13.00	\$15.96	\$0.00	\$67.47
For apprentice rates see "Apprentice- TELECOMMUNICATIONS TECHNICIAN"	03/01/2019	\$39.40	\$13.00	\$15.98	\$0.00	\$68.38
FIREMAN (ASST. ENGINEER) OPERATING ENGINEERS LOCAL 4	12/01/2017	\$38.57	\$10.50	\$15.50	\$0.00	\$64.57
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
FLAGGER & SIGNALER	06/01/2018	\$21.50	\$7.70	\$14.02	\$0.00	\$43.22
LABORERS - ZONE 2	12/01/2018	\$22.50	\$7.70	\$14.02	\$0.00	\$44.22
	06/01/2019	\$22.50	\$7.70	\$14.02	\$0.00	\$44.22
	12/01/2019	\$23.50	\$7.70	\$14.02	\$0.00	\$45.22
	06/01/2020	\$23.50	\$7.70	\$14.02	\$0.00	\$45.22
	12/01/2020	\$24.50	\$7.70	\$14.02	\$0.00	\$46.22
	06/01/2021	\$24.50	\$7.70	\$14.02	\$0.00	\$46.22
For apprentice rates see "Apprentice- LABORER"	12/01/2021	\$24.50	\$7.70	\$14.02	\$0.00	\$46.22
FLOORCOVERER FLOORCOVERERS LOCAL 2168 ZONE I	03/01/2016	\$42.13	\$9.80	\$17.62	\$0.00	\$69.55

#### Apprentice - FLOORCOVERER - Local 2168 Zone I

Effecti	ive Date - 03/01/20	016			Supplemental		
Step	percent	Apprentice Base Wage	Health	Pension	Unemployment	Tota	l Rate
1	50	\$21.07	\$9.80	\$1.79	\$0.00	\$	32.66
2	55	\$23.17	\$9.80	\$1.79	\$0.00	\$	34.76
3	60	\$25.28	\$9.80	\$12.25	\$0.00	\$	47.33
4	65	\$27.38	\$9.80	\$12.25	\$0.00	\$	49.43
5	70	\$29.49	\$9.80	\$14.04	\$0.00	\$	53.33
6	75	\$31.60	\$9.80	\$14.04	\$0.00	\$	55.44
7	80	\$33.70	\$9.80	\$15.83	\$0.00	\$	59.33
8	85	\$35.81	\$9.80	\$15.83	\$0.00	\$	61.44
Notes:	Steps are 750 hrs.						
		:/45/55/55/70/70/80/80 (1500hr Steps) &4 \$36.49/ 5&6 \$53.33/ 7&8 \$59.33					
Appre	ntice to Journeywor	ker Ratio:1:1					
FORK LIFT/CHERRY OPERATING ENGINEERS LO	-	12/01/2017	\$46.63	\$10.50	\$15.50	\$0.00	\$72.63
For apprentice rates see '	Apprentice- OPERATING	ENGINEERS"					
GENERATOR/LIGHT		ERS 12/01/2017	\$31.80	\$10.50	\$15.50	\$0.00	\$57.80
For apprentice rates see '	Apprentice- OPERATING	ENGINEERS"					

**Issue Date:** 06/25/2018

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
GLAZIER (GLASS PLANK/AIR BARRIER/INTERIOR	01/01/2018	\$39.16	\$8.10	\$19.55	\$0.00	\$66.81
SYSTEMS) GLAZIERS LOCAL 35 (ZONE 2)	07/01/2018	\$39.51	\$8.15	\$20.15	\$0.00	\$67.81
	01/01/2019	\$39.86	\$8.15	\$20.85	\$0.00	\$68.86
	07/01/2019	\$40.96	\$8.15	\$20.85	\$0.00	\$69.96
	01/01/2020	\$42.06	\$8.15	\$20.85	\$0.00	\$71.06
	07/01/2020	\$43.16	\$8.15	\$20.85	\$0.00	\$72.16
	01/01/2021	\$44.26	\$8.15	\$20.85	\$0.00	\$73.26

#### Apprentice - GLAZIER - Local 35 Zone 2 Effective Date - 01/01/2018

Effecti	tive Date - 01/01/2018					Supplemental			
Step	percent		Apprentice Base Wage	Health	Pension	Unemployment	Total Rate		
1	50		\$19.58	\$8.10	\$0.00	\$0.00	\$27.68		
2	55		\$21.54	\$8.10	\$5.06	\$0.00	\$34.70		
3	60		\$23.50	\$8.10	\$5.52	\$0.00	\$37.12		
4	65		\$25.45	\$8.10	\$5.98	\$0.00	\$39.53		
5	70		\$27.41	\$8.10	\$16.79	\$0.00	\$52.30		
6	75		\$29.37	\$8.10	\$17.25	\$0.00	\$54.72		
7	80		\$31.33	\$8.10	\$17.71	\$0.00	\$57.14		
8	90		\$35.24	\$8.10	\$18.63	\$0.00	\$61.97		

#### **Effective Date -** 07/01/2018

	Enecu	Ive Date - 07/01/2018				Supplemental	
	Step	percent	Apprentice Base Wage	Health	Pension	Unemployment	Total Rate
	1	50	\$19.76	\$8.15	\$0.00	\$0.00	\$27.91
	2	55	\$21.73	\$8.15	\$5.34	\$0.00	\$35.22
	3	60	\$23.71	\$8.15	\$5.82	\$0.00	\$37.68
	4	65	\$25.68	\$8.15	\$6.31	\$0.00	\$40.14
	5	70	\$27.66	\$8.15	\$17.24	\$0.00	\$53.05
	6	75	\$29.63	\$8.15	\$17.73	\$0.00	\$55.51
	7	80	\$31.61	\$8.15	\$18.21	\$0.00	\$57.97
	8	90	\$35.56	\$8.15	\$19.18	\$0.00	\$62.89
	Notes:						
		Steps are 750 hrs.					
	Appre	entice to Journeyworker Ratio:1:1	·				'
HOISTING EN OPERATING ENGL		R/CRANES/GRADALLS OCAL 4	12/01/2017	7 \$46.6	3 \$10.50	\$15.50	\$0.00 \$72.63

1	Appren		ATING ENGINEERS - Local 4						
		ve Date - 12	2/01/2017				Supplemental		
:	Step	percent	Appre	ntice Base Wage	Health	Pension	Unemployment	Total Rate	<u>;</u>
	1	55		\$25.65	\$10.50	\$0.00	\$0.00	\$36.15	;
	2	60		\$27.98	\$10.50	\$15.50	\$0.00	\$53.98	3
	3	65		\$30.31	\$10.50	\$15.50	\$0.00	\$56.31	L
	4	70		\$32.64	\$10.50	\$15.50	\$0.00	\$58.64	ł
	5	75		\$34.97	\$10.50	\$15.50	\$0.00	\$60.97	1
	6	80		\$37.30	\$10.50	\$15.50	\$0.00	\$63.30	)
	7	85		\$39.64	\$10.50	\$15.50	\$0.00	\$65.64	ł
	8	90		\$41.97	\$10.50	\$15.50	\$0.00	\$67.97	7
1 	Notes:							   	
	Apprei	ntice to Journ	eyworker Ratio:1:6						
HVAC (DUCTW Sheetmetal work		OCAL 17 - A		02/01/2018	\$44.	11 \$12.20	\$24.12	\$2.41	\$82.84
For apprentice ra	ates see ".	Apprentice- SHEE	ET METAL WORKER"						
HVAC (ELECTR		CONTROLS)		03/01/2018	\$50.	15 \$13.00	\$17.85	\$0.00	\$81.00
ELECTRICIANS LOC	AL 103			09/01/2018	\$51.	34 \$13.00	\$17.89	\$0.00	\$82.23
For apprentice ra	ates see ".	Apprentice- ELEC	TRICIAN"	03/01/2019	\$52.	\$13.00	\$17.93	\$0.00	\$83.46
HVAC (TESTIN			G - AIR)	02/01/2018	3 \$44.	11 \$12.20	\$24.12	\$2.41	\$82.84
For apprentice ra	ates see ".	Apprentice- SHEE	ET METAL WORKER"						
HVAC (TESTIN	G ANE	) BALANCIN	G -WATER)	09/01/2017	7 \$51. <del>.</del>	44 \$9.95	\$18.74	\$0.00	\$80.13
PIPEFITTERS LOCA	L 537			09/01/2018			\$18.74	\$0.00	\$81.63
				09/01/2019	<b>\$</b> 54.	44 \$9.95	\$18.74	\$0.00	\$83.13
				09/01/2020			\$18.74	\$0.00	\$84.63
For apprentice ra	ates see ".	Apprentice- PIPEI	FITTER" or "PLUMBER/PIPEFITTER"						
HVAC MECHAN				09/01/2017	\$51.	44 \$9.95	\$18.74	\$0.00	\$80.13
PIPEFITTERS LOCA	L 33/			09/01/2018	\$52.	94 \$9.95	\$18.74	\$0.00	\$81.63
				09/01/2019	\$54.	44 \$9.95	\$18.74	\$0.00	\$83.13
For apprentice ra	ates see "	Apprentice- PIPE	FITTER" or "PLUMBER/PIPEFITTER"	09/01/2020	\$55.	94 \$9.95	\$18.74	\$0.00	\$84.63
HYDRAULIC D					¢24	00 \$7.70	\$14.02	\$0.00	¢55.70
LABORERS - ZONE 2				06/01/2018			\$14.02 \$14.02		\$55.72 \$56.56
				12/01/2018				\$0.00 \$0.00	\$56.56 \$57.42
				06/01/2019			\$14.02 \$14.02	\$0.00 \$0.00	\$57.43 \$58.20
				12/01/2019			\$14.02 \$14.02	\$0.00 \$0.00	\$58.29
				06/01/2020			\$14.02 \$14.02	\$0.00 \$0.00	\$59.18
				12/01/2020			\$14.02	\$0.00	\$60.07
				06/01/2021			\$14.02	\$0.00	\$60.99
For apprentice ra	ates see ".	Apprentice- LAB	DRER"	12/01/2021	\$40.	18 \$7.70	\$14.02	\$0.00	\$61.90

# OPERATING ENGINEERS - Local 4

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Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
INSULATOR (PIPES & TANKS)	09/01/2017	\$47.09	\$11.75	\$14.20	\$0.00	\$73.04
HEAT & FROST INSULATORS LOCAL 6 (BOSTON)	09/01/2018	\$49.34	\$11.75	\$14.20	\$0.00	\$75.29
	09/01/2019	\$51.84	\$11.75	\$14.20	\$0.00	\$77.79

	·	worker Ratio:1:4						
1,0003	Steps are 1 year	r						
Notes								
4	80		\$39.47	\$11.75	\$12.70	\$0.00	\$63.92	
3	70		\$34.54	\$11.75	\$11.95	\$0.00	\$58.24	
2	60		\$29.60	\$11.75	\$11.20	\$0.00	\$52.55	
1	50		\$24.67	\$11.75	\$10.45	\$0.00	\$46.87	
Step	percent		Apprentice Base Wage	Health	Pension	Unemployment	Total Rate	
Effect	ive Date - 09/	01/2018				Supplemental		
4	80		\$37.67	\$11.75	\$12.70	\$0.00	\$62.12	
3	70		\$32.96	\$11.75	\$11.95	\$0.00	\$56.66	
2	60		\$28.25	\$11.75	\$11.20	\$0.00	\$51.20	
1	50		\$23.55	\$11.75	\$10.45	\$0.00	\$45.75	
Step	percent		Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate	

ASBESTOS INSULATOR (Pipes & Tanks) - Local 6 Boston Annrantica

IRONWORKI IRONWORKERS LOCAL 7 (BOSTON AREA)

#### Apprentice - IRONWORKER - Local 7 Boston

Effecti	ve Date -	03/16/2017				Supplemental	
Step	percent		Apprentice Base Wage	Health	Pension	Unemployment	Total Rate
1	60		\$26.79	\$7.80	\$20.85	\$0.00	\$55.44
2	70		\$31.26	\$7.80	\$20.85	\$0.00	\$59.91
3	75		\$33.49	\$7.80	\$20.85	\$0.00	\$62.14
4	80		\$35.72	\$7.80	\$20.85	\$0.00	\$64.37
5	85		\$37.95	\$7.80	\$20.85	\$0.00	\$66.60
6	90		\$40.19	\$7.80	\$20.85	\$0.00	\$68.84
Notes:							
		116.0					

\*\* Structural 1:6; Ornamental 1:4

Apprentice to Journeyworker Ratio:\*\*

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
JACKHAMMER & PAVING BREAKER OPERATOR	06/01/2018	\$33.50	\$7.70	\$14.02	\$0.00	\$55.22
LABORERS - ZONE 2	12/01/2018	\$34.34	\$7.70	\$14.02	\$0.00	\$56.06
	06/01/2019	\$35.21	\$7.70	\$14.02	\$0.00	\$56.93
	12/01/2019	\$36.07	\$7.70	\$14.02	\$0.00	\$57.79
	06/01/2020	\$36.96	\$7.70	\$14.02	\$0.00	\$58.68
	12/01/2020	\$37.85	\$7.70	\$14.02	\$0.00	\$59.57
	06/01/2021	\$38.77	\$7.70	\$14.02	\$0.00	\$60.49
	12/01/2021	\$39.68	\$7.70	\$14.02	\$0.00	\$61.40
For apprentice rates see "Apprentice- LABORER"						
LABORER	06/01/2018	\$33.25	\$7.70	\$14.02	\$0.00	\$54.97
LABORERS - ZONE 2	12/01/2018	\$34.09	\$7.70	\$14.02	\$0.00	\$55.81
	06/01/2019	\$34.96	\$7.70	\$14.02	\$0.00	\$56.68
	12/01/2019	\$35.82	\$7.70	\$14.02	\$0.00	\$57.54
	06/01/2020	\$36.71	\$7.70	\$14.02	\$0.00	\$58.43
	12/01/2020	\$37.60	\$7.70	\$14.02	\$0.00	\$59.32
	06/01/2021	\$38.52	\$7.70	\$14.02	\$0.00	\$60.24
	12/01/2021	\$39.43	\$7.70	\$14.02	\$0.00	\$61.15

### Apprentice - LABORER - Zone 2

**Effective Date -** 06/01/2018

Enecu	We Date - 00/01/2010				Supplemental	
Step	percent	Apprentice Base Wage	Health	Pension	Unemployment	Total Rate
1	60	\$19.95	\$7.70	\$14.02	\$0.00	\$41.67
2	70	\$23.28	\$7.70	\$14.02	\$0.00	\$45.00
3	80	\$26.60	\$7.70	\$14.02	\$0.00	\$48.32
4	90	\$29.93	\$7.70	\$14.02	\$0.00	\$51.65

Effective I	Date - 12/01/2018				Supplemental		
Step pe	ercent	Apprentice Base Wage	Health	Pension	Unemployment	Total Rate	
1 6	0	\$20.45	\$7.70	\$14.02	\$0.00	\$42.17	
2 70	0	\$23.86	\$7.70	\$14.02	\$0.00	\$45.58	
3 8	0	\$27.27	\$7.70	\$14.02	\$0.00	\$48.99	
4 9	0	\$30.68	\$7.70	\$14.02	\$0.00	\$52.40	

#### Notes:

### Apprentice to Journeyworker Ratio:1:5

LABORER: CARPENTER TENDER	06/01/2018	\$33.25	\$7.70	\$14.02	\$0.00	\$54.97
LABORERS - ZONE 2	12/01/2018	\$34.09	\$7.70	\$14.02	\$0.00	\$55.81
	06/01/2019	\$34.96	\$7.70	\$14.02	\$0.00	\$56.68
	12/01/2019	\$35.82	\$7.70	\$14.02	\$0.00	\$57.54
	06/01/2020	\$36.71	\$7.70	\$14.02	\$0.00	\$58.43
	12/01/2020	\$37.60	\$7.70	\$14.02	\$0.00	\$59.32
	06/01/2021	\$38.52	\$7.70	\$14.02	\$0.00	\$60.24
	12/01/2021	\$39.43	\$7.70	\$14.02	\$0.00	\$61.15

For apprentice rates see "Apprentice- LABORER"

Issue Date: 06/25/2018

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rat
LABORER: CEMENT FINISHER TENDER	06/01/2018	\$33.25	\$7.70	\$14.02	\$0.00	\$54.97
LABORERS - ZONE 2	12/01/2018	\$34.09	\$7.70	\$14.02	\$0.00	\$55.81
	06/01/2019	\$34.96	\$7.70	\$14.02	\$0.00	\$56.68
	12/01/2019	\$35.82	\$7.70	\$14.02	\$0.00	\$57.54
	06/01/2020	\$36.71	\$7.70	\$14.02	\$0.00	\$58.43
	12/01/2020	\$37.60	\$7.70	\$14.02	\$0.00	\$59.32
	06/01/2021	\$38.52	\$7.70	\$14.02	\$0.00	\$60.24
	12/01/2021	\$39.43	\$7.70	\$14.02	\$0.00	\$61.15
For apprentice rates see "Apprentice- LABORER"						
ABORER: HAZARDOUS WASTE/ASBESTOS REMOVER <i>ABORERS - ZONE 2</i>	06/01/2018	\$33.45	\$7.70	\$13.97	\$0.00	\$55.12
	12/01/2018	\$34.29	\$7.70	\$13.97	\$0.00	\$55.96
	06/01/2019	\$35.16	\$7.70	\$13.97	\$0.00	\$56.83
For appropriate sets and "Appropriate TADODED"	12/01/2019	\$36.02	\$7.70	\$13.97	\$0.00	\$57.69
For apprentice rates see "Apprentice- LABORER" ABORER: MASON TENDER	06/01/2018	\$33.50	\$7.70	\$14.02	\$0.00	\$55.22
ABORERS - ZONE 2	12/01/2018	\$33.30 \$34.34	\$7.70 \$7.70	\$14.02	\$0.00	\$56.06
	06/01/2019	\$34.34 \$35.21	\$7.70 \$7.70	\$14.02	\$0.00	\$56.93
	12/01/2019	\$36.07	\$7.70 \$7.70	\$14.02	\$0.00	\$50.95 \$57.79
	06/01/2020	\$36.96	\$7.70 \$7.70	\$14.02	\$0.00	\$58.68
	12/01/2020	\$30.90 \$37.85	\$7.70 \$7.70	\$14.02	\$0.00	\$59.57
	06/01/2020	\$37.83 \$38.77	\$7.70 \$7.70	\$14.02	\$0.00	\$59.57 \$60.49
	12/01/2021	\$39.68	\$7.70 \$7.70	\$14.02	\$0.00	\$61.40
For apprentice rates see "Apprentice- LABORER"	12/01/2021	\$39.08	\$7.70	ψ14.02	\$0.00	\$01.40
ABORER: MULTI-TRADE TENDER	06/01/2018	\$33.25	\$7.70	\$14.02	\$0.00	\$54.97
ABORERS - ZONE 2	12/01/2018	\$34.09	\$7.70	\$14.02	\$0.00	\$55.81
	06/01/2019	\$34.96	\$7.70	\$14.02	\$0.00	\$56.68
	12/01/2019	\$35.82	\$7.70	\$14.02	\$0.00	\$57.54
	06/01/2020	\$36.71	\$7.70	\$14.02	\$0.00	\$58.43
	12/01/2020	\$37.60	\$7.70	\$14.02	\$0.00	\$59.32
	06/01/2021	\$38.52	\$7.70	\$14.02	\$0.00	\$60.24
	12/01/2021	\$39.43	\$7.70	\$14.02	\$0.00	\$61.15
For apprentice rates see "Apprentice- LABORER"						
ABORER: TREE REMOVER <i>ABORERS - ZONE 2</i>	06/01/2018	\$33.25	\$7.70	\$14.02	\$0.00	\$54.97
ADORERS - ZOINE 2	12/01/2018	\$34.09	\$7.70	\$14.02	\$0.00	\$55.81
	06/01/2019	\$34.96	\$7.70	\$14.02	\$0.00	\$56.68
	12/01/2019	\$35.82	\$7.70	\$14.02	\$0.00	\$57.54
	06/01/2020	\$36.71	\$7.70	\$14.02	\$0.00	\$58.43
	12/01/2020	\$37.60	\$7.70	\$14.02	\$0.00	\$59.32
	06/01/2021	\$38.52	\$7.70	\$14.02	\$0.00	\$60.24
	12/01/2021	\$39.43	\$7.70	\$14.02	\$0.00	\$61.15

This classification applies to all tree work associated with the removal of standing trees, and trimming and removal of branches and limbs when the work is not done for a utility company for the purpose of operation, maintenance or repair of utility company equipment. For apprentice rates see "Apprentice-LABORER"

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Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	<b>Total Rate</b>
LASER BEAM OPERATOR	06/01/2018	\$33.50	\$7.70	\$14.02	\$0.00	\$55.22
LABORERS - ZONE 2	12/01/2018	\$34.34	\$7.70	\$14.02	\$0.00	\$56.06
	06/01/2019	\$35.21	\$7.70	\$14.02	\$0.00	\$56.93
	12/01/2019	\$36.07	\$7.70	\$14.02	\$0.00	\$57.79
	06/01/2020	\$36.96	\$7.70	\$14.02	\$0.00	\$58.68
	12/01/2020	\$37.85	\$7.70	\$14.02	\$0.00	\$59.57
	06/01/2021	\$38.77	\$7.70	\$14.02	\$0.00	\$60.49
	12/01/2021	\$39.68	\$7.70	\$14.02	\$0.00	\$61.40
For apprentice rates see "Apprentice- LABORER"						
MARBLE & TILE FINISHERS	02/01/2018	\$39.82	\$10.75	\$18.34	\$0.00	\$68.91
BRICKLAYERS LOCAL 3 - MARBLE & TILE	08/01/2018	\$40.90	\$10.75	\$18.47	\$0.00	\$70.12
	02/01/2019	\$41.41	\$10.75	\$18.47	\$0.00	\$70.63
	08/01/2019	\$42.49	\$10.75	\$18.61	\$0.00	\$71.85
	02/01/2020	\$43.00	\$10.75	\$18.61	\$0.00	\$72.36
	08/01/2020	\$44.08	\$10.75	\$18.76	\$0.00	\$73.59
	02/01/2021	\$44.59	\$10.75	\$18.76	\$0.00	\$74.10
	08/01/2021	\$45.71	\$10.75	\$18.92	\$0.00	\$75.38
	02/01/2022	\$46.18	\$10.75	\$18.92	\$0.00	\$75.85

Apprentice - MARBLE & TILE FINISHER - Local 3 Marble & Tile

Effective Date -		02/01/2018				Supplemental		
Step	percent		Apprentice Base Wage	Health	Pension	Unemployment	Total Rate	
1	50		\$19.91	\$10.75	\$18.34	\$0.00	\$49.00	
2	60		\$23.89	\$10.75	\$18.34	\$0.00	\$52.98	
3	70		\$27.87	\$10.75	\$18.34	\$0.00	\$56.96	
4	80		\$31.86	\$10.75	\$18.34	\$0.00	\$60.95	
5	90		\$35.84	\$10.75	\$18.34	\$0.00	\$64.93	

Step	ive Date - 08/01/2018 percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
step		Apprentice Base Wage	Incantii	1 chiston	Chempioyment	Total Rate
1	50	\$20.45	\$10.75	\$18.47	\$0.00	\$49.67
2	60	\$24.54	\$10.75	\$18.47	\$0.00	\$53.76
3	70	\$28.63	\$10.75	\$18.47	\$0.00	\$57.85
4	80	\$32.72	\$10.75	\$18.47	\$0.00	\$61.94
5	90	\$36.81	\$10.75	\$18.47	\$0.00	\$66.03

Apprentice to Journeyworker Ratio:1:3

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
MARBLE MASONS, TILELAYERS & TERRAZZO MECH	02/01/2018	\$52.10	\$10.75	\$20.03	\$0.00	\$82.88
BRICKLAYERS LOCAL 3 - MARBLE & TILE	08/01/2018	\$53.45	\$10.75	\$20.16	\$0.00	\$84.36
	02/01/2019	\$54.07	\$10.75	\$20.16	\$0.00	\$84.98
	08/01/2019	\$55.42	\$10.75	\$20.30	\$0.00	\$86.47
	02/01/2020	\$56.05	\$10.75	\$20.30	\$0.00	\$87.10
	08/01/2020	\$57.40	\$10.75	\$20.45	\$0.00	\$88.60
	02/01/2021	\$58.04	\$10.75	\$20.45	\$0.00	\$89.24
	08/01/2021	\$59.44	\$10.75	\$20.61	\$0.00	\$90.80
	02/01/2022	\$60.01	\$10.75	\$20.61	\$0.00	\$91.37

Apprentice - MARBLE-TILE-TERRAZZO MECHANIC - Local 3 Marble & Tile

Effect	ive Date - 02/01/2018				Supplemental		
Step	percent	Apprentice Base Wage	Health	Pension	Unemployment	Total Rate	
1	50	\$26.05	\$10.75	\$20.03	\$0.00	\$56.83	
2	60	\$31.26	\$10.75	\$20.03	\$0.00	\$62.04	
3	70	\$36.47	\$10.75	\$20.03	\$0.00	\$67.25	
4	80	\$41.68	\$10.75	\$20.03	\$0.00	\$72.46	
5	90	\$46.89	\$10.75	\$20.03	\$0.00	\$77.67	

		ve Date - 08/01/2018				Supplemental		
<u></u>	Step	percent	Apprentice Base Wage	Health	Pension	Unemployment	Total Rate	:
1	1	50	\$26.73	\$10.75	\$20.16	\$0.00	\$57.64	
2	2	60	\$32.07	\$10.75	\$20.16	\$0.00	\$62.98	
3	3	70	\$37.42	\$10.75	\$20.16	\$0.00	\$68.33	
4	4	80	\$42.76	\$10.75	\$20.16	\$0.00	\$73.67	
5	5	90	\$48.11	\$10.75	\$20.16	\$0.00	\$79.02	
N	Notes:							
İ								
A	Appre	ntice to Journeyworker Ratio:1:5						
AECH. SWEEPE		ERATOR (ON CONST. SITES) OCAL 4	12/01/2017	7 \$46.17	7 \$10.50	\$15.50	\$0.00	\$72.17
For apprentice rate	tes see "	Apprentice- OPERATING ENGINEERS"						
IECHANICS MA			12/01/2017	7 \$46.17	7 \$10.50	\$15.50	\$0.00	\$72.17
PERATING ENGINE								
	tes see "	Apprentice- OPERATING ENGINEERS"						
	Zone 2	)	04/01/2018	8 \$37.17	7 \$9.90	\$18.50	\$0.00	\$65.57

04/01/2019

\$38.87

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\$9.90

\$18.50

\$0.00

\$67.27

	••	ntice - <i>MILLWRIGHT - Local 1121</i> ive Date - 04/01/2018	Zone 2					
	Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate	
	1	55	\$20.44	\$9.90	\$5.31	\$0.00	\$35.65	
	2	65	\$24.16	\$9.90	\$15.13	\$0.00	\$49.19	
	3	75	\$27.88	\$9.90	\$16.10	\$0.00	\$53.88	
	4	85	\$31.59	\$9.90	\$17.06	\$0.00	\$58.55	
	Notes:							
		Steps are 2,000 hours						
	Appre	entice to Journeyworker Ratio:1:5						
IORTAR M	IIXER		06/01/2018	8 \$33.50	\$7.70	\$14.02	\$0.00	\$55.22
LABORERS - ZONE 2		12/01/2018			\$14.02	\$0.00	\$56.06	
			06/01/2019			\$14.02	\$0.00	\$56.93
			12/01/2019	9 \$36.07	\$7.70	\$14.02	\$0.00	\$57.79
			06/01/2020	\$36.96	\$7.70	\$14.02	\$0.00	\$58.68
			12/01/2020	\$37.85	\$7.70	\$14.02	\$0.00	\$59.57
			06/01/2021	\$38.77	\$7.70	\$14.02	\$0.00	\$60.49
			12/01/2021	\$39.68	\$7.70	\$14.02	\$0.00	\$61.40
		"Apprentice- LABORER"						
DILER (OTF PERATING EI		N TRUCK CRANES,GRADALLS) OCAL 4	12/01/2017	7 \$23.24	\$10.50	\$15.50	\$0.00	\$49.24
For apprent	tice rates see	"Apprentice- OPERATING ENGINEERS"						
DILER (TRU PERATING EI		NES, GRADALLS) <i>OCAL 4</i>	12/01/2017	7 \$27.40	\$10.50	\$15.50	\$0.00	\$53.40
For apprent	tice rates see	"Apprentice- OPERATING ENGINEERS"						
OTHER POV		VEN EQUIPMENT - CLASS II OCAL 4	12/01/2017	7 \$46.17	\$10.50	\$15.50	\$0.00	\$72.17
For apprent	tice rates see	"Apprentice- OPERATING ENGINEERS"						
AINTER (E			01/01/2018	8 \$49.66	\$8.10	\$19.55	\$0.00	\$77.31
AINTERS LOC	AL 35 - ZON	E 2	07/01/2018	8 \$50.01	\$8.15	\$20.15	\$0.00	\$78.31
			01/01/2019	\$50.36	\$8.15	\$20.85	\$0.00	\$79.36
			07/01/2019	9 \$51.46	\$8.15	\$20.85	\$0.00	\$80.46
			01/01/2020	\$52.56	\$8.15	\$20.85	\$0.00	\$81.56
			07/01/2020	\$53.66	\$8.15	\$20.85	\$0.00	\$82.66

## Apprentice - MILLWRIGHT - Local 1121 Zone 2

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Effect	ive Date -	01/01/2018				Supplemental	
Step	percent		Apprentice Base Wage	Health	Pension	Unemployment	Total Rate
1	50		\$24.83	\$8.10	\$0.00	\$0.00	\$32.93
2	55		\$27.31	\$8.10	\$5.06	\$0.00	\$40.47
3	60		\$29.80	\$8.10	\$5.52	\$0.00	\$43.42
4	65		\$32.28	\$8.10	\$5.98	\$0.00	\$46.36
5	70		\$34.76	\$8.10	\$16.79	\$0.00	\$59.65
6	75		\$37.25	\$8.10	\$17.25	\$0.00	\$62.60
7	80		\$39.73	\$8.10	\$17.71	\$0.00	\$65.54
8	90		\$44.69	\$8.10	\$18.63	\$0.00	\$71.42

### Apprentice - PAINTER Local 35 - BRIDGES/TANKS

Effective Date -	07/01/2018

<b>Effective Date -</b> 07/01/2018				Supplemental		
Step percent	Apprentice Base Wage	Health	Pension	Unemployment	Total Rate	
1 50	\$25.01	\$8.15	\$0.00	\$0.00	\$33.16	
2 55	\$27.51	\$8.15	\$5.34	\$0.00	\$41.00	
3 60	\$30.01	\$8.15	\$5.82	\$0.00	\$43.98	
4 65	\$32.51	\$8.15	\$6.31	\$0.00	\$46.97	
5 70	\$35.01	\$8.15	\$17.24	\$0.00	\$60.40	
6 75	\$37.51	\$8.15	\$17.73	\$0.00	\$63.39	
7 80	\$40.01	\$8.15	\$18.21	\$0.00	\$66.37	
8 90	\$45.01	\$8.15	\$19.18	\$0.00	\$72.34	
Notes: Steps are 750 hrs.						
Apprentice to Journeyworker Ratio:1:1						
PAINTER (SPRAY OR SANDBLAST, NEW) *	01/01/2018	\$40.56	\$8.10	\$19.55	\$0.00	\$68.21
* If 30% or more of surfaces to be painted are new constructio NEW paint rate shall be used. <i>PAINTERS LOCAL 35 - ZONE 2</i>	on, 07/01/2018	\$40.91	\$8.15	\$20.15	\$0.00	\$69.21
	01/01/2019	\$41.26	\$8.15	\$20.85	\$0.00	\$70.26
	07/01/2019	\$42.36	\$8.15	\$20.85	\$0.00	\$71.36
	01/01/2020	\$43.46	\$8.15	\$20.85	\$0.00	\$72.46
	07/01/2020	\$44.56	\$8.15	\$20.85	\$0.00	\$73.56
	01/01/2021	\$45.66	\$8.15	\$20.85	\$0.00	\$74.66

Effective Date -		01/01/2018			Supplemental			
Step	percent		Apprentice Base Wage	Health	Pension	Unemployment	Total Rate	
1	50		\$20.28	\$8.10	\$0.00	\$0.00	\$28.38	
2	55		\$22.31	\$8.10	\$5.06	\$0.00	\$35.47	
3	60		\$24.34	\$8.10	\$5.52	\$0.00	\$37.96	
4	65		\$26.36	\$8.10	\$5.98	\$0.00	\$40.44	
5	70		\$28.39	\$8.10	\$16.79	\$0.00	\$53.28	
6	75		\$30.42	\$8.10	\$17.25	\$0.00	\$55.77	
7	80		\$32.45	\$8.10	\$17.71	\$0.00	\$58.26	
8	90		\$36.50	\$8.10	\$18.63	\$0.00	\$63.23	

Apprentice -	PAINTER Local 35 Zone 2 - Spray/Sandblast - New
	01/01/2019

#### Effective Date - 07/01/2018

Effecti	<b>ive Date -</b> 07/01/2018				Supplemental		
Step	percent	Apprentice Base Wage	Health	Pension	Unemployment	Total Rate	
1	50	\$20.46	\$8.15	\$0.00	\$0.00	\$28.61	
2	55	\$22.50	\$8.15	\$5.34	\$0.00	\$35.99	
3	60	\$24.55	\$8.15	\$5.82	\$0.00	\$38.52	
4	65	\$26.59	\$8.15	\$6.31	\$0.00	\$41.05	
5	70	\$28.64	\$8.15	\$17.24	\$0.00	\$54.03	
6	75	\$30.68	\$8.15	\$17.73	\$0.00	\$56.56	
7	80	\$32.73	\$8.15	\$18.21	\$0.00	\$59.09	
8	90	\$36.82	\$8.15	\$19.18	\$0.00	\$64.15	
Notes:							
	Steps are 750 hrs.						
Appre	ntice to Journeyworker Ratio:1:1						
	SANDBLAST, REPAINT)	01/01/2018	3 \$38.62	\$8.10	\$19.55	\$0.00	\$66.27
PAINTERS LOCAL 35 - ZONI	E 2	07/01/2018	\$38.97	\$8.15	\$20.15	\$0.00	\$67.27
		01/01/2019	\$39.32	\$8.15	\$20.85	\$0.00	\$68.32
		07/01/2019	\$40.42	\$8.15	\$20.85	\$0.00	\$69.42
		01/01/2020	\$41.52	\$8.15	\$20.85	\$0.00	\$70.52

07/01/2020

01/01/2021

\$42.62

\$43.72

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\$8.15

\$8.15

\$20.85

\$20.85

\$0.00

\$0.00

\$71.62

\$72.72

Supplemental

Effecti	ve Date -	01/01/2018				Supplemental		
Step	percent		Apprentice Base Wage	Health	Pension	Unemployment	Total Rate	
1	50		\$19.31	\$8.10	\$0.00	\$0.00	\$27.41	
2	55		\$21.24	\$8.10	\$5.06	\$0.00	\$34.40	
3	60		\$23.17	\$8.10	\$5.52	\$0.00	\$36.79	
4	65		\$25.10	\$8.10	\$5.98	\$0.00	\$39.18	
5	70		\$27.03	\$8.10	\$16.79	\$0.00	\$51.92	
6	75		\$28.97	\$8.10	\$17.25	\$0.00	\$54.32	
7	80		\$30.90	\$8.10	\$17.71	\$0.00	\$56.71	
8	90		\$34.76	\$8.10	\$18.63	\$0.00	\$61.49	

Apprentice -	PAINTER Local 35 Zone 2 - Spray/Sandblast - Repaint
Effective Date	01/01/2018

#### Apprentice Base Wage Health Pension Unemployment Total Rate Step percent 1 50 \$19.49 \$8.15 \$0.00 \$0.00 \$27.64 2 55 \$21.43 \$8.15 \$5.34 \$0.00 \$34.92 3 60 \$23.38 \$8.15 \$5.82 \$0.00 \$37.35 4 65 \$25.33 \$0.00 \$8.15 \$6.31 \$39.79 5 70 \$27.28 \$8.15 \$17.24 \$0.00 \$52.67 6 75 \$29.23 \$8.15 \$0.00 \$17.73 \$55.11 7 80 \$31.18 \$0.00 \$8.15 \$18.21 \$57.54 8 90 \$35.07 \$8.15 \$0.00 \$19.18 \$62.40 Notes: Steps are 750 hrs. Apprentice to Journeyworker Ratio:1:1 PAINTER (TRAFFIC MARKINGS) 06/01/2018 \$14.02 \$0.00 \$33.25 \$7.70 \$54.97 LABORERS - ZONE 2 \$14.02 \$0.00 12/01/2018 \$34.09 \$7.70 \$55.81 06/01/2019 \$14.02 \$0.00 \$34.96 \$7.70 \$56.68 12/01/2019 \$35.82 \$7.70 \$14.02 \$0.00 \$57.54 06/01/2020 \$14.02 \$0.00 \$58.43 \$36.71 \$7.70 \$14.02 \$0.00 \$59.32 12/01/2020 \$37.60 \$7.70 \$14.02 06/01/2021 \$38.52 \$7.70 \$0.00 \$60.24 \$0.00 12/01/2021 \$39.43 \$7.70 \$14.02 \$61.15 For Apprentice rates see "Apprentice- LABORER" PAINTER / TAPER (BRUSH, NEW) \* \$19.55 \$0.00 01/01/2018 \$39.16 \$8.10 \$66.81 \* If 30% or more of surfaces to be painted are new construction, 07/01/2018 \$39.51 \$8.15 \$20.15 \$0.00 \$67.81 NEW paint rate shall be used. PAINTERS LOCAL 35 - ZONE 2 \$20.85 01/01/2019 \$39.86 \$8.15 \$0.00 \$68.86 \$20.85 \$0.00 07/01/2019 \$40.96 \$8.15 \$69.96 01/01/2020 \$42.06 \$8.15 \$20.85 \$0.00 \$71.06

07/01/2020

01/01/2021

\$43.16

\$44.25

\$8.15

\$8.15

\$20.85

\$20.85

\$0.00

\$0.00

**Effective Date -** 07/01/2018

\$72.16

\$73.25

Effect	ive Date -	01/01/2018				Supplemental		
Step	percent		Apprentice Base Wage	Health	Pension	Unemployment	Total Rate	
1	50		\$19.58	\$8.10	\$0.00	\$0.00	\$27.68	
2	55		\$21.54	\$8.10	\$5.06	\$0.00	\$34.70	
3	60		\$23.50	\$8.10	\$5.52	\$0.00	\$37.12	
4	65		\$25.45	\$8.10	\$5.98	\$0.00	\$39.53	
5	70		\$27.41	\$8.10	\$16.79	\$0.00	\$52.30	
6	75		\$29.37	\$8.10	\$17.25	\$0.00	\$54.72	
7	80		\$31.33	\$8.10	\$17.71	\$0.00	\$57.14	
8	90		\$35.24	\$8.10	\$18.63	\$0.00	\$61.97	

## Apprentice - PAINTER - Local 35 Zone 2 - BRUSH NEW

#### Effective Date - 07/01/2018

<b>Effective Date -</b> 07/01/2018				Supplemental		
Step percent	Apprentice Base Wage	Health	Pension	Unemployment	Total Rate	
1 50	\$19.76	\$8.15	\$0.00	\$0.00	\$27.91	
2 55	\$21.73	\$8.15	\$5.34	\$0.00	\$35.22	
3 60	\$23.71	\$8.15	\$5.82	\$0.00	\$37.68	
4 65	\$25.68	\$8.15	\$6.31	\$0.00	\$40.14	
5 70	\$27.66	\$8.15	\$17.24	\$0.00	\$53.05	
6 75	\$29.63	\$8.15	\$17.73	\$0.00	\$55.51	
7 80	\$31.61	\$8.15	\$18.21	\$0.00	\$57.97	
8 90	\$35.56	\$8.15	\$19.18	\$0.00	\$62.89	
Notes:						
Steps are 750 hrs.						
Apprentice to Journeyworker Ratio:1:1						
PAINTER / TAPER (BRUSH, REPAINT)	01/01/2018	3 \$37.22	\$8.10	\$19.55	\$0.00	\$64.87
PAINTERS LOCAL 35 - ZONE 2	07/01/2018	\$37.57	\$8.15	\$20.15	\$0.00	\$65.87
	01/01/2019	\$37.92	\$8.15	\$20.85	\$0.00	\$66.92
	07/01/2019	\$39.02	\$8.15	\$20.85	\$0.00	\$68.02
	01/01/2020	\$40.12	\$8.15	\$20.85	\$0.00	\$69.12
	07/01/2020	\$41.22	\$8.15	\$20.85	\$0.00	\$70.22

01/01/2021

\$42.32

\$8.15

\$20.85

\$0.00

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\$71.32

Effecti	ve Date -	01/01/2018				Supplemental		
Step	percent		Apprentice Base Wage	Health	Pension	Unemployment	Total Rate	
1	50		\$18.61	\$8.10	\$0.00	\$0.00	\$26.71	
2	55		\$20.47	\$8.10	\$5.06	\$0.00	\$33.63	
3	60		\$22.33	\$8.10	\$5.52	\$0.00	\$35.95	
4	65		\$24.19	\$8.10	\$5.98	\$0.00	\$38.27	
5	70		\$26.05	\$8.10	\$16.79	\$0.00	\$50.94	
6	75		\$27.92	\$8.10	\$17.25	\$0.00	\$53.27	
7	80		\$29.78	\$8.10	\$17.71	\$0.00	\$55.59	
8	90		\$33.50	\$8.10	\$18.63	\$0.00	\$60.23	

Apprentice -	PAINTER Local 35 Zone 2 - BRUSH REPAINT

Effective Date -	07/01/2018

1	Effecti	<b>ve Date -</b> 07/01/2018				Supplemental		
-	Step	percent	Apprentice Base Wage	Health	Pension	Unemployment	Total Rate	;
	1	50	\$18.79	\$8.15	\$0.00	\$0.00	\$26.94	
	2	55	\$20.66	\$8.15	\$5.34	\$0.00	\$34.15	
	3	60	\$22.54	\$8.15	\$5.82	\$0.00	\$36.51	
	4	65	\$24.42	\$8.15	\$6.31	\$0.00	\$38.88	
	5	70	\$26.30	\$8.15	\$17.14	\$0.00	\$51.59	
	6	75	\$28.18	\$8.15	\$17.63	\$0.00	\$53.96	
	7	80	\$30.06	\$8.15	\$18.11	\$0.00	\$56.32	
	8	90	\$33.81	\$8.15	\$19.08	\$0.00	\$61.04	
1	Notes:							
ĺ		Steps are 750 hrs.						
	Appre	ntice to Journeyworker Ratio:1:1						
PANEL & PICKU			12/01/2012	\$30.28	3 \$9.07	\$8.00	\$0.00	\$47.35
	CK CON	ISTRUCTOR (UNDERPINNING AN	D 08/01/2017	\$44.27	7 \$9.90	\$21.15	\$0.00	\$75.32
DECK) Pile driver locai	L 56 (ZO	NE 1)	08/01/2018	\$46.57	\$9.90	\$21.15	\$0.00	\$77.62
		Apprentice- PILE DRIVER"	08/01/2019	\$48.94	\$9.90	\$21.15	\$0.00	\$79.99
						<b>\$21.15</b>	<b>\$0.00</b>	<b>*-------------</b>
			08/01/2017	\$44.27	7 \$9.90	\$21.15	\$0.00	\$75.32
PILE DRIVER PILE DRIVER LOCAI	L 56 (ZO	NE I)	08/01/2017 08/01/2018			\$21.15 \$21.15	\$0.00 \$0.00	\$75.32 \$77.62

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Effect	ive Date -	08/01/2017						
Step	percent	00/01/2017	Apprentice Base Wage	e Health	Pension	Supplemental Unemployment	Total Rate	
1	50		\$22.14	\$9.90	\$21.15	\$0.00	\$53.19	
2	60		\$26.56	\$9.90	\$21.15	\$0.00	\$57.61	
3	70		\$30.99	\$9.90	\$21.15	\$0.00	\$62.04	
4	75		\$33.20	\$9.90	\$21.15	\$0.00	\$64.25	
5	80		\$35.42	\$9.90	\$21.15	\$0.00	\$66.47	
6	80		\$35.42	\$9.90	\$21.15	\$0.00	\$66.47	
7	90		\$39.84	\$9.90	\$21.15	\$0.00	\$70.89	
8	90		\$39.84	\$9.90	\$21.15	\$0.00	\$70.89	

# Apprentice - PILE DRIVER - Local 56 Zone 1

#### Effective Date - 08/01/2018

Effective Da	ate - 08/01/2018				Supplemental		
Step per	cent	Apprentice Base Wage	Health	Pension	Unemployment	Total Rate	
1 50		\$23.29	\$9.90	\$21.15	\$0.00	\$54.34	
2 60		\$27.94	\$9.90	\$21.15	\$0.00	\$58.99	
3 70		\$32.60	\$9.90	\$21.15	\$0.00	\$63.65	
4 75		\$34.93	\$9.90	\$21.15	\$0.00	\$65.98	
5 80		\$37.26	\$9.90	\$21.15	\$0.00	\$68.31	
6 80		\$37.26	\$9.90	\$21.15	\$0.00	\$68.31	
7 90		\$41.91	\$9.90	\$21.15	\$0.00	\$72.96	
8 90		\$41.91	\$9.90	\$21.15	\$0.00	\$72.96	
Notes:							
Apprentice	to Journeyworker Ratio:1:5						
PIPEFITTER & STEAMFIT	TER	09/01/2017	\$51.44	\$9.95	\$18.74	\$0.00	\$80.13
PIPEFITTERS LOCAL 537		09/01/2018	\$52.94	\$9.95	\$18.74	\$0.00	\$81.63
		09/01/2019	\$54.44	\$9.95	\$18.74	\$0.00	\$83.13

09/01/2020

\$55.94

\$9.95

\$18.74

\$0.00

\$84.63

	Effective Step p	ercent	09/01/2017	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate	
-		40		\$20.58	\$9.95	\$7.75	\$0.00	\$38.28	
	2 4	15		\$23.15	\$9.95	\$18.74	\$0.00	\$51.84	
	3 6	50		\$30.86	\$9.95	\$18.74	\$0.00	\$59.55	
	4 7	70		\$36.01	\$9.95	\$18.74	\$0.00	\$64.70	
	5 8	30		\$41.15	\$9.95	\$18.74	\$0.00	\$69.84	
	Effective	Date - 0	09/01/2018				Supplemental		
	Step p	ercent		Apprentice Base Wage	Health	Pension	Unemployment	Total Rate	
	1 4	40		\$21.18	\$9.95	\$7.75	\$0.00	\$38.88	
	2 4	45		\$23.82	\$9.95	\$18.74	\$0.00	\$52.51	
	3 6	50		\$31.76	\$9.95	\$18.74	\$0.00	\$60.45	
	4 7	70		\$37.06	\$9.95	\$18.74	\$0.00	\$65.75	
	5 8	30		\$42.35	\$9.95	\$18.74	\$0.00	\$71.04	
			; 1:10 thereafter / Steps		7.0.20.10.22/	Mov			
	** R	efrig/AC N		;3:6;4:8;5:10;6:12;7:14;8:17				   	
	** R Apprentic	efrig/AC N	Mechanic **1:1;1:2;2:4	;3:6;4:8;5:10;6:12;7:14;8:17	3 \$33.50		\$14.02	\$0.00	\$55.22
PELAYER	** R Apprentic	efrig/AC N	Mechanic **1:1;1:2;2:4	;3:6;4:8;5:10;6:12;7:14;8:17	3 \$33.50	\$7.70	\$14.02	\$0.00	\$56.06
ELAYER	** R Apprentic	efrig/AC N	Mechanic **1:1;1:2;2:4	;3:6;4:8;5:10;6:12;7:14;8:17 06/01/2018 12/01/2018 06/01/2019	3 \$33.50 3 \$34.34 9 \$35.21	\$7.70 \$7.70 \$7.70	\$14.02 \$14.02	\$0.00 \$0.00	\$56.06 \$56.93
PELAYER	** R Apprentic	efrig/AC N	Mechanic **1:1;1:2;2:4	;3:6;4:8;5:10;6:12;7:14;8:17 06/01/2018 12/01/2018 06/01/2019 12/01/2019	3       \$33.50         3       \$34.34         9       \$35.21         9       \$36.07	\$7.70 \$7.70 \$7.70 \$7.70	\$14.02 \$14.02 \$14.02	\$0.00 \$0.00 \$0.00	\$56.06 \$56.93 \$57.79
ELAYER	** R Apprentic	efrig/AC N	Mechanic **1:1;1:2;2:4	;3:6;4:8;5:10;6:12;7:14;8:17 06/01/2018 12/01/2018 06/01/2019 12/01/2019 06/01/2020	3       \$33.50         3       \$34.34         9       \$35.21         9       \$36.07         9       \$36.96	\$7.70 \$7.70 \$7.70 \$7.70 \$7.70 \$7.70	\$14.02 \$14.02 \$14.02 \$14.02	\$0.00 \$0.00 \$0.00 \$0.00	\$56.06 \$56.93 \$57.79 \$58.68
ELAYER	** R Apprentic	efrig/AC N	Mechanic **1:1;1:2;2:4	;3:6;4:8;5:10;6:12;7:14;8:17 06/01/2018 12/01/2018 06/01/2019 12/01/2019 06/01/2020 12/01/2020	3       \$33.50         3       \$34.34         9       \$35.21         9       \$36.07         9       \$36.96         9       \$37.85	\$7.70 \$7.70 \$7.70 \$7.70 \$7.70 \$7.70 \$7.70	\$14.02 \$14.02 \$14.02 \$14.02 \$14.02	\$0.00 \$0.00 \$0.00 \$0.00 \$0.00	\$56.06 \$56.93 \$57.79 \$58.68 \$59.57
PELAYER	** R Apprentic	efrig/AC N	Mechanic **1:1;1:2;2:4	;3:6;4:8;5:10;6:12;7:14;8:17 06/01/2018 12/01/2018 06/01/2019 12/01/2019 06/01/2020 12/01/2020 06/01/2021	3       \$33.50         3       \$34.34         9       \$35.21         9       \$36.07         9       \$36.96         9       \$37.85         \$38.77	\$7.70 \$7.70 \$7.70 \$7.70 \$7.70 \$7.70 \$7.70 \$7.70	\$14.02 \$14.02 \$14.02 \$14.02 \$14.02 \$14.02	\$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00	\$56.06 \$56.93 \$57.79 \$58.68 \$59.57 \$60.49
ELAYER	2	efrig/AC N	Mechanic **1:1;1:2;2:4 neyworker Ratio:**	;3:6;4:8;5:10;6:12;7:14;8:17 06/01/2018 12/01/2018 06/01/2019 12/01/2019 06/01/2020 12/01/2020	3       \$33.50         3       \$34.34         9       \$35.21         9       \$36.07         9       \$36.96         9       \$37.85         \$38.77	\$7.70 \$7.70 \$7.70 \$7.70 \$7.70 \$7.70 \$7.70 \$7.70	\$14.02 \$14.02 \$14.02 \$14.02 \$14.02	\$0.00 \$0.00 \$0.00 \$0.00 \$0.00	\$56.06 \$56.93 \$57.79 \$58.68 \$59.57
ELAYER ORERS - ZONE 2	2	efrig/AC M ce to Journ	Mechanic **1:1;1:2;2:4 neyworker Ratio:**	;3:6;4:8;5:10;6:12;7:14;8:17 06/01/2018 12/01/2018 06/01/2019 12/01/2019 06/01/2020 12/01/2020 06/01/2021 12/01/2021	3       \$33.50         3       \$34.34         9       \$35.21         9       \$36.07         9       \$36.96         9       \$37.85         \$38.77       \$39.68	\$7.70 \$7.70 \$7.70 \$7.70 \$7.70 \$7.70 \$7.70 \$7.70 \$7.70	\$14.02 \$14.02 \$14.02 \$14.02 \$14.02 \$14.02 \$14.02 \$14.02	\$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00	\$56.06 \$56.93 \$57.79 \$58.68 \$59.57 \$60.49 \$61.40
ELAYER ORERS - ZONE 2 For apprentice ra JMBERS & C	2 ates see "App	efrig/AC M ce to Journ orentice- LAE ERS	Mechanic **1:1;1:2;2:4 neyworker Ratio:**	;3:6;4:8;5:10;6:12;7:14;8:17 06/01/2018 12/01/2018 06/01/2019 12/01/2019 06/01/2020 12/01/2020 06/01/2021	3       \$33.50         3       \$34.34         9       \$35.21         9       \$36.07         9       \$36.96         9       \$37.85         1       \$38.77         1       \$39.68         3       \$54.69	\$7.70 \$7.70 \$7.70 \$7.70 \$7.70 \$7.70 \$7.70 \$7.70 \$7.70 \$7.70 \$7.70	\$14.02 \$14.02 \$14.02 \$14.02 \$14.02 \$14.02	\$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00	\$56.06 \$56.93 \$57.79 \$58.68 \$59.57 \$60.49
ELAYER ORERS - ZONE 2 For apprentice ra JMBERS & C	2 ates see "App	efrig/AC M ce to Journ orentice- LAE ERS	Mechanic **1:1;1:2;2:4 neyworker Ratio:**	3:6;4:8;5:10;6:12;7:14;8:17 06/01/2018 12/01/2018 06/01/2019 12/01/2019 06/01/2020 12/01/2020 06/01/2021 12/01/2021 12/01/2021 03/01/2018	3       \$33.50         3       \$34.34         9       \$35.21         9       \$36.07         9       \$36.96         9       \$37.85         1       \$38.77         1       \$39.68         3       \$54.69         3       \$56.19	\$7.70 \$7.70 \$7.70 \$7.70 \$7.70 \$7.70 \$7.70 \$7.70 \$7.70 \$7.70 \$11.57	\$14.02 \$14.02 \$14.02 \$14.02 \$14.02 \$14.02 \$14.02 \$14.02 \$15.76	\$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00	\$56.06 \$56.93 \$57.79 \$58.68 \$59.57 \$60.49 \$61.40 \$82.02 \$83.52
ELAYER ORERS - ZONE 2 For apprentice ra JMBERS & C	2 ates see "App	efrig/AC M ce to Journ orentice- LAE ERS	Mechanic **1:1;1:2;2:4 neyworker Ratio:**	;3:6;4:8;5:10;6:12;7:14;8:17 06/01/2018 12/01/2018 06/01/2019 12/01/2019 06/01/2020 12/01/2020 06/01/2021 12/01/2021 03/01/2018 09/01/2018	3       \$33.50         3       \$34.34         9       \$35.21         9       \$36.07         9       \$36.96         9       \$37.85         1       \$38.77         1       \$39.68         3       \$54.69         3       \$56.19         9       \$57.69	\$7.70 \$7.70 \$7.70 \$7.70 \$7.70 \$7.70 \$7.70 \$7.70 \$7.70 \$7.70 \$11.57 \$11.57	\$14.02 \$14.02 \$14.02 \$14.02 \$14.02 \$14.02 \$14.02 \$14.02 \$15.76 \$15.76	\$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00	\$56.06 \$56.93 \$57.79 \$58.68 \$59.57 \$60.49 \$61.40 \$82.02 \$83.52 \$85.02
ELAYER ORERS - ZONE 2 For apprentice ra JMBERS & (	2 ates see "App	efrig/AC M ce to Journ orentice- LAE ERS	Mechanic **1:1;1:2;2:4 neyworker Ratio:**	;3:6;4:8;5:10;6:12;7:14;8:17 06/01/2018 12/01/2018 06/01/2019 12/01/2019 06/01/2020 12/01/2020 06/01/2021 12/01/2021 03/01/2018 09/01/2018 03/01/2019	3       \$33.50         3       \$34.34         9       \$35.21         9       \$36.96         9       \$36.96         9       \$37.85         1       \$38.77         1       \$39.68         3       \$54.69         3       \$56.19         9       \$57.69         9       \$59.19	\$7.70 \$7.70 \$7.70 \$7.70 \$7.70 \$7.70 \$7.70 \$7.70 \$7.70 \$11.57 \$11.57 \$11.57 \$11.57	\$14.02 \$14.02 \$14.02 \$14.02 \$14.02 \$14.02 \$14.02 \$14.02 \$15.76 \$15.76 \$15.76	\$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00	\$56.06 \$56.93 \$57.79 \$58.68 \$59.57 \$60.49 \$61.40 \$82.02 \$83.52 \$83.52 \$85.02 \$86.52
PELAYER BORERS - ZONE 2	2 ates see "App	efrig/AC M ce to Journ orentice- LAE ERS	Mechanic **1:1;1:2;2:4 neyworker Ratio:**	;3:6;4:8;5:10;6:12;7:14;8:17 06/01/2018 12/01/2018 06/01/2019 12/01/2019 06/01/2020 12/01/2020 06/01/2021 12/01/2021 03/01/2018 09/01/2018 03/01/2019	3       \$33.50         3       \$34.34         9       \$35.21         9       \$36.07         9       \$36.96         9       \$37.85         1       \$38.77         1       \$39.68         3       \$54.69         3       \$56.19         9       \$57.69         9       \$59.19         9       \$60.69	\$7.70 \$7.70 \$7.70 \$7.70 \$7.70 \$7.70 \$7.70 \$7.70 \$7.70 \$7.70 \$11.57 \$11.57 \$11.57 \$11.57 \$11.57	\$14.02 \$14.02 \$14.02 \$14.02 \$14.02 \$14.02 \$14.02 \$14.02 \$15.76 \$15.76 \$15.76 \$15.76	\$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00 \$0.00	\$56.06 \$56.93 \$57.79 \$58.68 \$59.57 \$60.49 \$61.40 \$82.02

Effective Date - 03/01/2018				Supplemental		
Step percent	Apprentice Base Wage	Health	Pension	Unemployment	Total Rate	
1 35	\$19.14	\$11.57	\$5.72	\$0.00	\$36.43	
2 40	\$21.88	\$11.57	\$6.49	\$0.00	\$39.94	
3 55	\$30.08	\$11.57	\$8.81	\$0.00	\$50.46	
4 65	\$35.55	\$11.57	\$10.36	\$0.00	\$57.48	
5 75	\$41.02	\$11.57	\$11.90	\$0.00	\$64.49	
<b>Effective Date -</b> 09/01/2018				Supplemental		
Step percent	Apprentice Base Wage	Health	Pension	Unemployment	Total Rate	
1 35	\$19.67	\$11.57	\$5.72	\$0.00	\$36.96	
2 40	\$22.48	\$11.57	\$6.49	\$0.00	\$40.54	
3 55	\$30.90	\$11.57	\$8.82	\$0.00	\$51.29	
4 65	\$36.52	\$11.57	\$10.36	\$0.00	\$58.45	
5 75	\$42.14	\$11.57	\$11.90	\$0.00	\$65.61	
Notes:						
** 1:2; 2:6; 3:10; 4:14; 5:19 Step4 with lic\$61.00, Step5						
Apprentice to Journeyworker Rat	io:**					
EUMATIC CONTROLS (TEMP.)	09/01/201	7 \$51.44	\$9.95	\$18.74	\$0.00	\$80.13
PEFITTERS LOCAL 537	09/01/201	8 \$52.94	\$9.95	\$18.74	\$0.00	\$81.63
	09/01/201	9 \$54.44	\$9.95	\$18.74	\$0.00	\$83.13
	09/01/202	0 \$55.94	\$9.95	\$18.74	\$0.00	\$84.63
For apprentice rates see "Apprentice- PIPEFITTER" or "PLU	MBER/PIPEFITTER"					
NEUMATIC DRILL/TOOL OPERATOR	06/01/201	8 \$33.50	\$7.70	\$14.02	\$0.00	\$55.22
BORERS - ZONE 2	12/01/201	8 \$34.34	\$7.70	\$14.02	\$0.00	\$56.06
	06/01/201	9 \$35.21	\$7.70	\$14.02	\$0.00	\$56.93
	12/01/201	9 \$36.07	\$7.70	\$14.02	\$0.00	\$57.79
	06/01/202	0 \$36.96	\$7.70	\$14.02	\$0.00	\$58.68
	12/01/202	0 \$37.85	\$7.70	\$14.02	\$0.00	\$59.57
	06/01/202	1 \$38.77	\$7.70	\$14.02	\$0.00	\$60.49
	12/01/202	1 \$39.68	\$7.70	\$14.02	\$0.00	\$61.40
For apprentice rates see "Apprentice- LABORER"						
WDERMAN & BLASTER	06/01/201	8 \$34.25	\$7.70	\$14.02	\$0.00	\$55.97
BORERS - ZONE 2	12/01/201	8 \$35.09	\$7.70	\$14.02	\$0.00	\$56.81
	06/01/201	9 \$35.96	\$7.70	\$14.02	\$0.00	\$57.68
	12/01/201	9 \$36.82	\$7.70	\$14.02	\$0.00	\$58.54
	06/01/202	0 \$37.71	\$7.70	\$14.02	\$0.00	\$59.43
	12/01/202	0 \$38.60	\$7.70	\$14.02	\$0.00	\$60.32
	06/01/202	1 \$39.52	\$7.70	\$14.02	\$0.00	\$61.24
	12/01/202			\$14.02	\$0.00	\$62.15
For apprentice rates see "Apprentice- LABORER"						

Apprentice -	PLUMBER/GASFITTER - Local 12
	02/01/2019

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Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
POWER SHOVEL/DERRICK/TRENCHING MACHINE OPERATING ENGINEERS LOCAL 4	12/01/2017	\$46.63	\$10.50	\$15.50	\$0.00	\$72.63
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
PUMP OPERATOR (CONCRETE) OPERATING ENGINEERS LOCAL 4	12/01/2017	\$46.63	\$10.50	\$15.50	\$0.00	\$72.63
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
PUMP OPERATOR (DEWATERING, OTHER) OPERATING ENGINEERS LOCAL 4	12/01/2017	\$31.80	\$10.50	\$15.50	\$0.00	\$57.80
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
READY MIX CONCRETE DRIVERS after 4/30/10 (Drivers Hired After 4/30/2010) <i>TEAMSTERS LOCAL 25c</i>	07/01/2017	\$28.18	\$8.48	\$9.72	\$0.00	\$46.38
READY-MIX CONCRETE DRIVER TEAMSTERS LOCAL 25c	07/01/2017	\$29.48	\$8.48	\$9.72	\$0.00	\$47.68
RECLAIMERS OPERATING ENGINEERS LOCAL 4	12/01/2017	\$46.17	\$10.50	\$15.50	\$0.00	\$72.17
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
RIDE-ON MOTORIZED BUGGY OPERATOR	06/01/2018	\$33.50	\$7.70	\$14.02	\$0.00	\$55.22
LABORERS - ZONE 2	12/01/2018	\$34.34	\$7.70	\$14.02	\$0.00	\$56.06
	06/01/2019	\$35.21	\$7.70	\$14.02	\$0.00	\$56.93
	12/01/2019	\$36.07	\$7.70	\$14.02	\$0.00	\$57.79
	06/01/2020	\$36.96	\$7.70	\$14.02	\$0.00	\$58.68
	12/01/2020	\$37.85	\$7.70	\$14.02	\$0.00	\$59.57
	06/01/2021	\$38.77	\$7.70	\$14.02	\$0.00	\$60.49
	12/01/2021	\$39.68	\$7.70	\$14.02	\$0.00	\$61.40
For apprentice rates see "Apprentice- LABORER"						
ROLLER/SPREADER/MULCHING MACHINE OPERATING ENGINEERS LOCAL 4	12/01/2017	\$46.17	\$10.50	\$15.50	\$0.00	\$72.17
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
ROOFER (Inc.Roofer Waterproofng &Roofer Damproofg)	02/01/2018	\$42.36	\$11.35	\$14.80	\$0.00	\$68.51
ROOFERS LOCAL 33	08/01/2018	\$43.46	\$11.35	\$14.80	\$0.00	\$69.61
	02/01/2019	\$44.61	\$11.35	\$14.80	\$0.00	\$70.76

	Appre	ntice - KOOFEK - Local 5.	)								
	Effecti	ive Date - 02/01/2018				Supplemental					
	Step	percent	Apprentice Base Wage	Health	Pension	Unemployment	Total Rate	;			
	1	50	\$21.18	\$11.35	\$3.44	\$0.00	\$35.97				
	2	60	\$25.42	\$11.35	\$14.80	\$0.00	\$51.57				
	3	65	\$27.53	\$11.35	\$14.80	\$0.00	\$53.68				
	4	75	\$31.77	\$11.35	\$14.80	\$0.00	\$57.92				
	5	85	\$36.01	\$11.35	\$14.80	\$0.00	\$62.16				
	Effective Date - 08/01/2018           Step         percent         Apprentice Base Wage         Health         Pension         Supplemental Unemployment         Total Rate           1         50         \$21.73         \$11.35         \$3.44         \$0.00         \$36.52           2         60         \$26.08         \$11.35         \$14.80         \$0.00         \$52.23										
	Step	percent	Apprentice Base Wage	Health	Pension		Total Rate	;			
	1	50	\$21.73	\$11.35	\$3.44	\$0.00	\$36.52				
	2	60	\$26.08	\$11.35	\$14.80	\$0.00	\$52.23				
	3	65	\$28.25	\$11.35	\$14.80	\$0.00	\$54.40	)			
	4	75	\$32.60	\$11.35	\$14.80	\$0.00	\$58.75				
	5	85	\$36.94	\$11.35	\$14.80	\$0.00	\$63.09	1			
	Notes:	** 1:5, 2:6-10, the 1:10; Ret	roofing: 1:4, then 1:1								
		Step 1 is 2000 hrs.; Steps 2 (Hot Pitch Mechanics' rece	-5 are 1000 hrs. ive \$1.00 hr. above ROOFER)								
	Appre	ntice to Journeyworker Ra	tio:**								
		E / PRECAST CONCRETE	02/01/2018	8 \$42.61	\$11.35	\$14.80	\$0.00	\$68.76			
OOFERS LOCAL	33		08/01/2018	8 \$43.71	\$11.35	\$14.80	\$0.00	\$69.86			
			02/01/2019	9 \$44.86	\$11.35	\$14.80	\$0.00	\$71.01			
For apprentice	e rates see	'Apprentice- ROOFER"									
SHEETMETAI			02/01/2018	8 \$44.11	\$12.20	\$24.12	\$2.41	\$82.84			

Apprentice - ROOFER - Local 33

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Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	\$17.64	\$12.20	\$5.61	\$0.00	\$35.45
2	40	\$17.64	\$12.20	\$5.61	\$0.00	\$35.45
3	45	\$19.85	\$12.20	\$10.85	\$1.29	\$44.19
4	45	\$19.85	\$12.20	\$10.85	\$1.29	\$44.19
5	50	\$22.06	\$12.20	\$11.80	\$1.38	\$47.44
6	50	\$22.06	\$12.20	\$12.05	\$1.39	\$47.70
7	60	\$26.47	\$12.20	\$13.70	\$1.57	\$53.94
8	65	\$28.67	\$12.20	\$14.65	\$1.67	\$57.19
9	75	\$33.08	\$12.20	\$16.56	\$1.86	\$63.70
10	85	\$37.49	\$12.20	\$17.96	\$2.03	\$69.68
Notes:						
	Steps are 6 mos.					
Appre	entice to Journeyworker Ratio	:1:4				
TOR		06/01/2013	3 \$25.8	81 \$7.07	\$7.05 \$	50.00 \$ <u>´</u>

## Apprentice - SHEET METAL WORKER - Local 17-A

Apprentice -	SIGN ERECTOR - Local 35 Zone 2
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	Effecti	ive Date - 06/01/2013				Supplemental		
	Step	percent	Apprentice Base Wage	Health	Pension	Unemployment	Total I	Rate
	1	50	\$12.91	\$7.07	\$0.00	\$0.00	\$1	9.98
	2	55	\$14.20	\$7.07	\$2.45	\$0.00	\$2.	3.72
	3	60	\$15.49	\$7.07	\$2.45	\$0.00	\$2:	5.01
	4	65	\$16.78	\$7.07	\$2.45	\$0.00	\$2	5.30
	5	70	\$18.07	\$7.07	\$7.05	\$0.00	\$32	2.19
	6	75	\$19.36	\$7.07	\$7.05	\$0.00	\$3.	3.48
	7	80	\$20.65	\$7.07	\$7.05	\$0.00	\$34	4.77
	8	85	\$21.94	\$7.07	\$7.05	\$0.00	\$30	5.06
	9	90	\$23.23	\$7.07	\$7.05	\$0.00	\$3	7.35
	Notes:							
		Steps are 4 mos.						
	Appre	ntice to Journeyworker Ratio:1:1						
SPECIALIZED TEAMSTERS JOINT		H MOVING EQUIP < 35 TONS IL NO. 10 ZONE B	12/01/2016	5 \$32.44	\$10.91	\$10.89	\$0.00	\$54.24
SPECIALIZED TEAMSTERS JOINT		H MOVING EQUIP > 35 TONS IL NO. 10 ZONE B	12/01/2016	5 \$32.73	\$10.91	\$10.89	\$0.00	\$54.53

#### Classification

SPRINKLER FITTER SPRINKLER FITTERS LOCAL 550 - (Section A) Zone 1

Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
03/01/2018	\$57.78	\$9.12	\$18.15	\$0.00	\$85.05
10/01/2018	\$59.28	\$9.12	\$18.15	\$0.00	\$86.55
01/01/2019	\$59.28	\$9.47	\$18.35	\$0.00	\$87.10
03/01/2019	\$60.78	\$9.47	\$18.35	\$0.00	\$88.60
10/01/2019	\$62.28	\$9.47	\$18.35	\$0.00	\$90.10
03/01/2020	\$63.78	\$9.47	\$18.35	\$0.00	\$91.60
10/01/2020	\$65.28	\$9.47	\$18.35	\$0.00	\$93.10
03/01/2021	\$66.78	\$9.47	\$18.35	\$0.00	\$94.60

#### Apprentice - SPRINKLER FITTER - Local 550 (Section A) Zone 1 Effective Date 03/01/2018

Effecti	ive Date -	03/01/2018				Supplemental		
Step	percent		Apprentice Base Wage	Health	Pension	Unemployment	Total Rate	
1	35		\$20.22	\$9.12	\$8.90	\$0.00	\$38.24	
2	40		\$23.11	\$9.12	\$8.90	\$0.00	\$41.13	
3	45		\$26.00	\$9.12	\$8.90	\$0.00	\$44.02	
4	50		\$28.89	\$9.12	\$8.90	\$0.00	\$46.91	
5	55		\$31.78	\$9.12	\$8.90	\$0.00	\$49.80	
6	60		\$34.67	\$9.12	\$10.40	\$0.00	\$54.19	
7	65		\$37.56	\$9.12	\$10.40	\$0.00	\$57.08	
8	70		\$40.45	\$9.12	\$10.40	\$0.00	\$59.97	
9	75		\$43.34	\$9.12	\$10.40	\$0.00	\$62.86	
10	80		\$46.22	\$9.12	\$10.40	\$0.00	\$65.74	

Effe	ctive Date - 10/01/2018				Supplemental		
Step	percent	Apprentice Base Wage	Health	Pension	Unemployment	Total Rate	e
1	35	\$20.75	\$9.12	\$8.90	\$0.00	\$38.77	7
2	40	\$23.71	\$9.12	\$8.90	\$0.00	\$41.73	3
3	45	\$26.68	\$9.12	\$8.90	\$0.00	\$44.70	)
4	50	\$29.64	\$9.12	\$8.90	\$0.00	\$47.66	6
5	55	\$32.60	\$9.12	\$8.90	\$0.00	\$50.62	2
6	60	\$35.57	\$9.12	\$10.40	\$0.00	\$55.09	)
7	65	\$38.53	\$9.12	\$10.40	\$0.00	\$58.05	5
8	70	\$41.50	\$9.12	\$10.40	\$0.00	\$61.02	2
9	75	\$44.46	\$9.12	\$10.40	\$0.00	\$63.98	3
10	80	\$47.42	\$9.12	\$10.40	\$0.00	\$66.94	1
Not	es: Apprentice entered prior 9/30/10 40/45/50/55/60/65/70/75/80/85					 	
	40/45/50/55/60/65/70/75/80/85 Steps are 850 hours						
App	orentice to Journeyworker Ratio:1	:3					
TEAM BOILER OI		12/01/2017	7 \$46.17	\$10.50	\$15.50	\$0.00	\$72.17
For apprentice rates s	ee "Apprentice- OPERATING ENGINEERS	"					
AMPERS, SELF-P	ROPELLED OR TRACTOR DRAY	WN 12/01/2017	7 \$46.17	\$10.50	\$15.50	\$0.00	\$72.17
For apprentice rates s	ee "Apprentice- OPERATING ENGINEERS	"					

Issue Date: 06/25/2018

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
TELECOMMUNICATION TECHNICIAN	03/01/2018	\$37.61	\$13.00	\$15.93	\$0.00	\$66.54
ELECTRICIANS LOCAL 103	09/01/2018	\$38.51	\$13.00	\$15.96	\$0.00	\$67.47
	03/01/2019	\$39.40	\$13.00	\$15.98	\$0.00	\$68.38

rr							
Effect	ive Date -	03/01/2018				Supplemental	
Step	percent		Apprentice Base Wage	Health	Pension	Unemployment	Total Rate
1	40		\$15.04	\$13.00	\$0.45	\$0.00	\$28.49
2	40		\$15.04	\$13.00	\$0.45	\$0.00	\$28.49
3	45		\$16.92	\$13.00	\$12.74	\$0.00	\$42.66
4	45		\$16.92	\$13.00	\$12.74	\$0.00	\$42.66
5	50		\$18.81	\$13.00	\$13.03	\$0.00	\$44.84
6	55		\$20.69	\$13.00	\$13.32	\$0.00	\$47.01
7	60		\$22.57	\$13.00	\$13.61	\$0.00	\$49.18
8	65		\$24.45	\$13.00	\$13.90	\$0.00	\$51.35
9	70		\$26.33	\$13.00	\$14.19	\$0.00	\$53.52
10	75		\$28.21	\$13.00	\$14.48	\$0.00	\$55.69

### Apprentice - TELECOMMUNICATION TECHNICIAN - Local 103

Effective Date	- 09/01/2018				Supplemental		
Step percen	t	Apprentice Base Wage	Health	Pension	Unemployment	Tota	l Rate
1 40		\$15.40	\$13.00	\$0.46	\$0.00	\$	628.86
2 40		\$15.40	\$13.00	\$0.46	\$0.00	\$	528.86
3 45		\$17.33	\$13.00	\$12.75	\$0.00	\$	643.08
4 45		\$17.33	\$13.00	\$12.75	\$0.00	\$	643.08
5 50		\$19.26	\$13.00	\$13.05	\$0.00	\$	45.31
6 55		\$21.18	\$13.00	\$13.34	\$0.00	\$	647.52
7 60		\$23.11	\$13.00	\$13.62	\$0.00	\$	649.73
8 65		\$25.03	\$13.00	\$13.92	\$0.00	\$	51.95
9 70		\$26.96	\$13.00	\$14.21	\$0.00	\$	54.17
10 75		\$28.88	\$13.00	\$14.50	\$0.00	\$	556.38
Notes:							
	Journeyworker Ratio:1:1						
TERRAZZO FINISHERS BRICKLAYERS LOCAL 3 - MARBLE &	THE	02/01/2018	\$\$1.00	\$10.75	\$20.03	\$0.00	\$81.78
DRICKLATERS LOCAL J - MARDLE &	TILE	08/01/2018	\$52.35	\$10.75	\$20.16	\$0.00	\$83.26
		02/01/2019	\$52.99	\$10.75	\$20.16	\$0.00	\$83.90
		08/01/2019	\$54.34	\$10.75	\$20.30	\$0.00	\$85.39
		02/01/2020	\$54.98	\$10.75	\$20.30	\$0.00	\$86.03

08/01/2020

02/01/2021

08/01/2021

02/01/2022

\$10.75

\$10.75

\$10.75

\$10.75

\$56.33

\$56.97

\$58.37

\$58.96

\$20.45

\$20.45

\$20.61

\$20.61

\$0.00

\$0.00

\$0.00

\$0.00

\$87.53

\$88.17

\$89.73

\$90.32

	Effect Step	ive Date - 02/01/2018 percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate	
	1	50	\$25.50	\$10.75	\$20.03	\$0.00	\$56.28	
	2	60	\$25.50		\$20.03 \$20.03	\$0.00	\$50.28	
	3	70	\$35.70	\$10.75	\$20.03 \$20.03	\$0.00 \$0.00	\$66.48	
	4	80		\$10.75				
	5	90	\$40.80 \$45.00	\$10.75 \$10.75	\$20.03	\$0.00 \$0.00	\$71.58	
	5	90	\$45.90	\$10.75	\$20.03	\$0.00	\$76.68	
	Notes	· · · · · · · · · · · · · · · · · · ·						
L	Appre	entice to Journeyworker Ratio:1:3						
EST BORING			06/01/2018	8 \$39.35	\$7.70	\$15.40	\$0.00	\$62.45
ABORERS - FOUNI	DATION	AND MARINE	12/01/2018	\$40.30	\$7.70	\$15.40	\$0.00	\$63.40
			06/01/2019	\$41.30	\$7.70	\$15.40	\$0.00	\$64.40
			12/01/2019	\$42.30	\$7.70	\$15.40	\$0.00	\$65.40
			06/01/2020	\$43.29	\$7.70	\$15.40	\$0.00	\$66.39
			12/01/2020	\$44.27	\$7.70	\$15.40	\$0.00	\$67.37
			06/01/202	\$45.29	\$7.70	\$15.40	\$0.00	\$68.39
D. (1			12/01/202	\$46.30	\$7.70	\$15.40	\$0.00	\$69.40
For apprentice ra		"Apprentice- LABORER"	0.(101/201)		<b>.</b>	¢15.40	\$0.00	<b><b>(1 1</b></b>
ABORERS - FOUNI			06/01/2018			\$15.40	\$0.00	\$61.17
			12/01/2018			\$15.40	\$0.00	\$62.12
			06/01/2019			\$15.40	\$0.00	\$63.12
			12/01/2019			\$15.40	\$0.00	\$64.12
			06/01/2020			\$15.40	\$0.00	\$65.11
			12/01/2020			\$15.40	\$0.00	\$66.09
			06/01/202			\$15.40	\$0.00	\$67.11
For apprentice ra	ates see	"Apprentice- LABORER"	12/01/202	\$45.02	\$7.70	\$15.40	\$0.00	\$68.12
EST BORING			06/01/2018	3 \$37.95	\$7.70	\$15.40	\$0.00	\$61.05
ABORERS - FOUNI	DATION	AND MARINE	12/01/2018	\$38.90	\$7.70	\$15.40	\$0.00	\$62.00
			06/01/2019	\$39.90	\$7.70	\$15.40	\$0.00	\$63.00
			12/01/2019	9 \$40.90	\$7.70	\$15.40	\$0.00	\$64.00
			06/01/2020	\$41.89	\$7.70	\$15.40	\$0.00	\$64.99
			12/01/2020	\$42.87	\$7.70	\$15.40	\$0.00	\$65.97
			06/01/2021	\$43.89	\$7.70	\$15.40	\$0.00	\$66.99
			12/01/202	\$44.90	\$7.70	\$15.40	\$0.00	\$68.00
		"Apprentice- LABORER"						
PERATING ENGIN	IEERS L		12/01/2017	\$46.17	\$10.50	\$15.50	\$0.00	\$72.17
		"Apprentice- OPERATING ENGINEERS"						
		TH MOVING EQUIPMENT CIL NO. 10 ZONE B	12/01/2016	5 \$33.02	\$10.91	\$10.89	\$0.00	\$54.82

**Issue Date:** 06/25/2018

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Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
FUNNEL WORK - COMPRESSED AIR Aborers (compressed Air)	06/01/2018	\$50.23	\$7.70	\$15.80	\$0.00	\$73.73
ABORERS (COMFRESSED AIR)	12/01/2018	\$51.18	\$7.70	\$15.80	\$0.00	\$74.68
	06/01/2019	\$52.18	\$7.70	\$15.80	\$0.00	\$75.68
	12/01/2019	\$53.18	\$7.70	\$15.80	\$0.00	\$76.68
	06/01/2020	\$54.17	\$7.70	\$15.80	\$0.00	\$77.67
	12/01/2020	\$55.15	\$7.70	\$15.80	\$0.00	\$78.65
	06/01/2021	\$56.17	\$7.70	\$15.80	\$0.00	\$79.67
	12/01/2021	\$57.18	\$7.70	\$15.80	\$0.00	\$80.68
For apprentice rates see "Apprentice- LABORER"						
IUNNEL WORK - COMPRESSED AIR (HAZ. WASTE) LABORERS (COMPRESSED AIR)	06/01/2018	\$52.23	\$7.70	\$15.80	\$0.00	\$75.73
	12/01/2018	\$53.18	\$7.70	\$15.80	\$0.00	\$76.68
	06/01/2019	\$54.18	\$7.70	\$15.80	\$0.00	\$77.68
	12/01/2019	\$55.18	\$7.70	\$15.80	\$0.00	\$78.68
	06/01/2020	\$56.17	\$7.70	\$15.80	\$0.00	\$79.67
	12/01/2020	\$57.15	\$7.70	\$15.80	\$0.00	\$80.65
	06/01/2021	\$58.17	\$7.70	\$15.80	\$0.00	\$81.67
	12/01/2021	\$59.18	\$7.70	\$15.80	\$0.00	\$82.68
For apprentice rates see "Apprentice- LABORER"				** = **		
ΓUNNEL WORK - FREE AIR LABORERS (FREE AIR TUNNEL)	06/01/2018	\$42.30	\$7.70	\$15.80	\$0.00	\$65.80
	12/01/2018	\$43.25	\$7.70	\$15.80	\$0.00	\$66.75
	06/01/2019	\$44.25	\$7.70	\$15.80	\$0.00	\$67.75
	12/01/2019	\$45.25	\$7.70	\$15.80	\$0.00	\$68.75
	06/01/2020	\$46.24	\$7.70	\$15.80	\$0.00	\$69.74
	12/01/2020	\$47.22	\$7.70	\$15.80	\$0.00	\$70.72
	06/01/2021	\$48.24	\$7.70	\$15.80	\$0.00	\$71.74
For apprentice rates see "Apprentice- LABORER"	12/01/2021	\$49.25	\$7.70	\$15.80	\$0.00	\$72.75
FUNNEL WORK - FREE AIR (HAZ. WASTE)	06/01/2018	\$44.30	\$7.70	\$15.80	\$0.00	\$67.80
ABORERS (FREE AIR TUNNEL)	12/01/2018	\$45.25	\$7.70	\$15.80	\$0.00	\$67.00 \$68.75
	06/01/2019	\$46.25	\$7.70	\$15.80	\$0.00	\$69.75
	12/01/2019	\$40.25 \$47.25	\$7.70 \$7.70	\$15.80	\$0.00	\$09.75 \$70.75
	06/01/2020	\$47.23 \$48.24	\$7.70 \$7.70	\$15.80	\$0.00	\$70.73 \$71.74
				\$15.80	\$0.00	
	12/01/2020	\$49.22 \$50.24	\$7.70			\$72.72
	06/01/2021	\$50.24 \$51.25	\$7.70	\$15.80	\$0.00 \$0.00	\$73.74
For apprentice rates see "Apprentice- LABORER"	12/01/2021	\$51.25	\$7.70	\$15.80	\$0.00	\$74.75
VAC-HAUL TEAMSTERS JOINT COUNCIL NO. 10 ZONE B	12/01/2016	\$32.44	\$10.91	\$10.89	\$0.00	\$54.24
WAGON DRILL OPERATOR	06/01/2018	\$33.50	\$7.70	\$14.02	\$0.00	\$55.22
LABORERS - ZONE 2	12/01/2018	\$34.34	\$7.70	\$14.02	\$0.00	\$56.06
	06/01/2019	\$35.21	\$7.70	\$14.02	\$0.00	\$56.93
	12/01/2019	\$36.07	\$7.70	\$14.02	\$0.00	\$57.79
	06/01/2020	\$36.96	\$7.70	\$14.02	\$0.00	\$58.68
	12/01/2020	\$37.85	\$7.70	\$14.02	\$0.00	\$59.57
	06/01/2021	\$38.77	\$7.70	\$14.02	\$0.00	\$60.49
	12/01/2021	\$39.68	\$7.70	\$14.02	\$0.00	\$61.40

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
WASTE WATER PUMP OPERATOR	12/01/2017	\$46.63	\$10.50	\$15.50	\$0.00	\$72.63
OPERATING ENGINEERS LOCAL 4						
For apprentice rates see "Apprentice- OPERATING ENGINEERS"			*	<b><i>ф15 7</i></b> (	<u> </u>	*** **
WATER METER INSTALLER PLUMBERS & GASFITTERS LOCAL 12	03/01/2018	\$54.69	\$11.57	\$15.76	\$0.00	\$82.02
	09/01/2018	\$56.19	\$11.57	\$15.76	\$0.00	\$83.52
	03/01/2019	\$57.69	\$11.57	\$15.76	\$0.00	\$85.02
	09/01/2019	\$59.19	\$11.57	\$15.76	\$0.00	\$86.52
	03/01/2020	\$60.69	\$11.57	\$15.76	\$0.00	\$88.02
	09/01/2020	\$62.19	\$11.57	\$15.76	\$0.00	\$89.52
	03/01/2021	\$63.69	\$11.57	\$15.76	\$0.00	\$91.02
For apprentice rates see "Apprentice- PLUMBER/PIPEFITTER" or "PLUMBER/G/	ASFITTER"					
Outside Electrical - East						
CABLE TECHNICIAN (Power Zone) OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104	09/03/2017	\$27.14	\$7.75	\$1.81	\$0.00	\$36.70
For apprentice rates see "Apprentice- LINEMAN"						
CABLEMAN (Underground Ducts & Cables) OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104	09/03/2017	\$38.45	\$7.75	\$9.53	\$0.00	\$55.73
For apprentice rates see "Apprentice- LINEMAN"						
DRIVER / GROUNDMAN CDL OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104	09/03/2017	\$31.66	\$7.75	\$9.44	\$0.00	\$48.85
For apprentice rates see "Apprentice- LINEMAN"						
DRIVER / GROUNDMAN -Inexperienced (<2000 Hrs) OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104	09/03/2017	\$24.88	\$7.75	\$1.75	\$0.00	\$34.38
For apprentice rates see "Apprentice- LINEMAN"						
EQUIPMENT OPERATOR (Class A CDL) OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104	09/03/2017	\$38.45	\$7.75	\$13.61	\$0.00	\$59.81
For apprentice rates see "Apprentice- LINEMAN"						
EQUIPMENT OPERATOR (Class B CDL) OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104	09/03/2017	\$33.92	\$7.75	\$10.21	\$0.00	\$51.88
For apprentice rates see "Apprentice- LINEMAN"						
GROUNDMAN OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104	09/03/2017	\$24.88	\$7.75	\$1.75	\$0.00	\$34.38
For apprentice rates see "Apprentice- LINEMAN"						
GROUNDMAN -Inexperienced (<2000 Hrs.) OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104	09/03/2017	\$20.35	\$7.75	\$1.61	\$0.00	\$29.71
For apprentice rates see "Apprentice- LINEMAN"						
JOURNEYMAN LINEMAN OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104	09/03/2017	\$45.23	\$7.75	\$16.61	\$0.00	\$69.59

	Step	ve Date - 09/03/2017 percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate	e
	1	60	\$27.14	\$7.75	\$3.31	\$0.00	\$38.20	)
	2	65	\$29.40	\$7.75	\$3.38	\$0.00	\$40.53	3
	3	70	\$31.66	\$7.75	\$3.45	\$0.00	\$42.80	6
	4	75	\$33.92	\$7.75	\$5.02	\$0.00	\$46.69	)
	5	80	\$36.18	\$7.75	\$5.09	\$0.00	\$49.02	2
	6	85	\$38.45	\$7.75	\$5.15	\$0.00	\$51.3	5
	7	90	\$40.71	\$7.75	\$7.22	\$0.00	\$55.68	3
	Notes:							
	••	ntice to Journeyworker Ratio:	.1:2					
ELEDATA CABLE SPLICER		02/05/2018	\$\$\$\$\$\$\$\$	\$4.70	\$3.15	\$0.00	\$37.83	
			02/04/2019	\$30.73	\$4.70	\$3.17	\$0.00	\$38.60
ELEDATA LINEMAN/EQUIPMENT OPERATOR UTSIDE ELECTRICAL WORKERS - EAST LOCAL 104		05/05/2018	\$28.22	\$4.70	\$3.10	\$0.00	\$36.02	
UISIDE ELECTI	MCAL WO	KKEKS - EAST LOCAL 104	02/04/2019	\$28.93	\$4.70	\$3.14	\$0.00	\$36.77
ELEDATA WIREMAN/INSTALLER/TECHNICIAN DUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104		N 02/05/2018	\$28.22	2 \$4.70	\$3.10	\$0.00	\$36.02	
		02/04/2019	\$28.93	\$4.70	\$3.14	\$0.00	\$36.77	
REE TRIMM		RKERS - EAST LOCAL 104	01/31/2016	5 \$18.51	\$3.55	\$0.00	\$0.00	\$22.06
operating, ma	intaining, c	· · · · · · · · · · · · · · · · · · ·	v company, R.E.A. cooperative, or railroad nent, and (c) by a person who is using han			· · ·		
REE TRIMM	IER GRO		01/31/2016	5 \$16.32	2 \$3.55	\$0.00	\$0.00	\$19.87

Apprentice -	LINEMAN (Outside Electrical) - East Local 104
	00/02/2017

Additional Apprentice Information:

classification does not apply to wholesale tree removal.

Minimum wage rates for apprentices employed on public works projects are listed above as a percentage of the pre-determined hourly wage rate established by the Commissioner under the provisions of the M.G.L. c. 149, ss. 26-27D. Apprentice ratios are established by the Division of Apprenticeship Training pursuant to M.G.L. c. 23, ss. 11E-11L.

All apprentices must be registered with the Division of Apprenticeship Training in accordance with M.G.L. c. 23, ss. 11E-11L.

All steps are six months (1000 hours.)

Ratios are expressed in allowable number of apprentices to journeymen or fraction thereof, unless otherwise specified.

\*\* Multiple ratios are listed in the comment field.

\*\*\* APP to JM; 1:1, 2:2, 2:3, 3:4, 4:4, 4:5, 4:6, 5:7, 6:7, 6:8, 6:9, 7:10, 8:10, 8:11, 8:12, 9:13, 10:13, 10:14, etc.

\*\*\*\* APP to JM; 1:1, 1:2, 2:3, 2:4, 3:5, 4:6, 4:7, 5:8, 6:9, 6:10, 7:11, 8:12, 8:13, 9:14, 10:15, 10:16, etc.

#### SECTION 01010

#### SUMMARY OF WORK

#### PART 1- GENERAL:

#### 1.01 PROJECT DESCRIPTION

The project is the improvements of **East School Park** areas as described in the Contract Documents.

#### 1.02 CONTRACT TIME

- A. The work of this contract shall be completed by July 15, 2019.
- B. The Contractor shall submit shop drawings, data and samples or place his/her order sufficiently early to permit consideration and approval by the Landscape Architect\Engineer before materials are necessary for incorporation into the Work. Any delay resulting from the Contractor's failure to do so shall not be used as a basis of a claim against the Owner.

#### 1.03 CONTRACT DOCUMENTS

The Contract Documents are enumerated in the Agreement, and include these Specifications and the Drawings, as prepared for Town of Natick, by Weston & Sampson Engineers, Inc.

#### 1.04 INSPECTION OF THE SITE

It is a contract requirement of the Contractor that his/her subcontractor shall have thoroughly inspected the site during the bidding period. By submitting a bid they confirm that they are thoroughly familiar with the site and all existing conditions which impact and affect their work. Requests for extra compensation will not be considered for any work which could have been foreseen by a visual inspection of the site.

#### 1.05 CONTRACTOR'S USE OF THE SITE

- A. The contractor will have full access to the site shown within the Contract Limit of Work Line.
  - 1. The Contractor, his/her Subcontractors, and their employees may park on the site inside the Contract Limit of Work Line, given that no such on-site parking interferes with the site work.
  - 2. The Contractor shall furnish his/her own toilet facilities on-site.
- B. The Contractor shall take all precautions necessary to protect all abutting properties during construction. Any and all damage caused by construction operations shall be repaired.
  - 1. The project site shall be kept clean and free from accumulation of waste material and debris.
  - 2. The Contractor, his/her Subcontractors, and their employees shall be respectful and courteous of the neighborhood while working on site.

#### 1.06 ENCLOSURES

Provide at the earliest practical time temporary enclosure of materials, work in progress and completed portions of the work to provide protection to the work and the employees.

#### 1.07 SAFETY AND SECURITY

- A. The Contractor shall be responsible for the safety and security of the site within the Contract Limit of Work Line and for the safety of all persons who enter within the Contract Limit of Work Line.
- B. The Contractor shall be responsible for initiating, maintaining, and supervising all safety precautions & programs in connection with the work. He/she shall promulgate safety regulations and shall notify the Owner of particular hazards.
- C. The Contractor shall erect and maintain, as required by existing conditions and progress of work, all reasonable safeguards for safety and security. This includes the construction of barriers and the posting of danger signs and other warnings against hazards. By these and other necessary methods the Contractor shall stop unauthorized entry within the Contract Limit of Work Line.
- D. The Contractor shall cooperate with and maintain a close liaison with the Police Department and Fire Department, and he/she shall abide by safety or security related requests from any of these authorities.

#### 1.08 WORK TO BE DONE

The work of this Contract includes improvements to the East Park property and includes, but is not necessarily limited to the following:

- 1. Excavation, backfill and grading
- 2. Tree clearing, grubbing, and pruning
- 3. Removal and disposal of existing asphalt and gravel driveways
- 4. Installation of two (2) tennis courts, two (1) basketball court
- 5. Installation of play structures and rubber surfacing
- 6. Installation of a little league\pony league baseball field and associated improvements
- 7. Seeding and or sodding of lawn areas as designated
- 8. Installation of stone dust walking paths
- 9. Installation of asphalt drive and parking areas
- 10. Installation of concrete walking paths
- 11. Installation of drainage and utility improvements
- 12. Installation of other miscellaneous site improvements as designated in the Contract Documents

#### END OF SECTION

### SECTION 01025

### MEASUREMENT AND PAYMENT

#### PART 1 - GENERAL:

#### 1.01 BASE BID

- A. Measurement
  - 1. Measurement for payment for improvements to the East School park and Navy Yard Park Properties shall be on a single lump-sum basis.
- B. Payment
  - 1. Payment of the lump-sum price under the Base Bid of the Proposal shall fully compensate the Contractor for furnishing all labor, materials, equipment and incidentals required for work described in SECTION 01010, SUMMARY OF WORK of these Specifications.
  - 2. Contractor shall submit substantiated estimates for payment in an approved form (AIA Pay Requisition Format) at monthly intervals or when mutually agreed by Contractor and Landscape Architect/Engineer.

### 1.02 ADDITIONAL WORK

- A. Increases or decreases in the quantities of certain classes of work, when ordered or approved in writing by the Landscape Architect/Engineer.
- B. Additional Work, if any shall be performed at a mutually satisfactory price agreed upon between the Landscape Architect/Engineer and Contractor.

### END OF SECTION

#### SECTION 01031

#### ALLOWANCE

#### PART 1 GENERAL

#### 1.01 RELATED DOCUMENTS

- A. All of the Contract Documents, including the General and Supplementary Conditions and Division 0 – Bidding Documents, Contract Forms, and Conditions of the Contract and Division 1 – General Requirements, apply to the work of this Section.
- B. Carefully examine all the Contract Documents for requirements that affect the work of this Section. The exact scope of this Section cannot be determined without a thorough review of all specification sections and other Contract Documents.

#### 1.02 SUMMARY

- A. The Schedule of Allowances included on the bid form lists all the Allowances which appear in the Contract Documents, and the Specification Sections which are affected by each Alternate.
- B. Furnish all labor, materials, equipment and incidentals necessary to construct and develop a naturally developed well complete as specified herein, including test pumping and all accessories or related items required for proper installation and development.
- 1.03 GENERAL INSTRUCTIONS
  - A. Each Bidder shall be held fully responsible for examining the scope of the Allowance generally defined herein.
  - B. Irrigation Wells East Park and Navy Park

8" x 1,200-foot deep open bedrock well - Target Well Yield is 50 gpm

- C. Bedrock Irrigation Well
  - 1. Well contractor shall be licensed for well drilling, and shall furnish proof of successful installation of similar wells with similar capacity and size on five installations over the past ten years. The well licensed water well contractor shall furnish proof that the company is a registered Massachusetts well driller.
  - 2. All materials used to construct the water production well shall be ANSI/NSF 61 approved for contact with potable water. No petroleum products shall be used on the

#### 01030-1 ALLOWANCES

casings, well screens, casing coatings, or other materials that penetrate the ground surface. Casings and well materials shall be new, free of dirt, grease, oil, etc. Engineer may require steam cleaning or other cleaning methods may be required as deemed necessary by the Engineer.

- 3. All local permits shall be obtained by the contractor.
- 4. Sufficient containment and erosion control measures to minimize overland flow and buildup of drill water and drill cuttings on the site and neighboring properties and prevent flow of drill water and cuttings into surface water and sanitary or storm drains.
- 5. Overburden drilling to top of bedrocka. Estimated to be up to 50-feet below existing grade
- 6. Installation of 63-feet of 8-inch steel casing to create sanitary seal a minimum of 10-feet into competent bedrock and have a minimum 2-foot stick up above final grade.
- 7. Advancement nominal 8-inch diameter hammer bit up to 1,200-feet into bedrock
  - a. Target yield is 50 gpm.
  - b. Identify and develop water bearing fractures during advancement of the open bedrock borehole.
  - c. Conduct brief flow test at each location where appreciable flow is encountered to rate and approximate the well yield.
  - d. Should the target yield of 50 gpm be achieved at a depth prior to 1,200-feet the drilling shall be terminated and the borehole cleaned out to its full depth prior to removing the drill string.
  - e. To confirm the potential yield the well will be tested by conducting a prolonged, 4-hour development of the borehole utilizing the downhole drill tools.
- 8. Provide a complete Well Completion Report including all diameters, depths, casing length, fracture locations, fracture yields and a log of the borehole.
- D. Submersible Well Pumping Equipment
  - 1. To be installed by a Licensed MA Well Driller.
  - 2. Prepare and deliver equipment submittal information.
  - 3. Disinfect well by the addition of a 50 ppm chlorine solution.
  - 4. Furnish and install submersible well pumping equipment including the following:
    - a. MAASS Midwest 8J2 side mount pitless adapter
    - b. MA DEP approved water tight well cap
    - c. 500-feet of 2-inch diameter threaded and coupled galvanized steel drop pipe
      - 21-foot max length

#### 01030-2 ALLOWANCES

- d. An all stainless-steel submersible well pump with built in check valve designed to deliver 50 gpm against a TDH of 680-feet
  - Design based on a Grundfos 45S150-28 pump bowl
- e. A 6-inch diameter 15Hp, 3-phase, 460 Volt three wire submersible electric motor
- f. 550-feet of a minimum #8/3 flat double jacketed copper wire/submersible pump cable
- 5. Coordinate with irrigation contractor for all necessary irrigation connections.
- 6. Provide equipment startup services to ensure proper operation of the new equipment providing Operations and Maintenance manuals for the pump and motor assemblies and training as needed.

### 1.04 SUBMITTALS

- A. Prior to use of any material for this well, the Contractor shall provide to the Engineer the following submittals:
  - 1. A bill of lading or other approved evidence identifying the casing pipe.
  - 2. All proposed equipment
  - 3. A construction plan generally describing the methods, techniques, material, and changes or deviations from the work as described herein.

### 1.05 RECORD DRAWING

1. A Record Drawing shall be prepared by the Contractor for this well which shall show in pictorial for the depth for each change of formation (strata), a description of each formation, static water level and appropriate remarks on subsurface conditions as may be appropriate. Also, the record drawing shall show all details of construction but with actual length and materials as installed for the well.

### CONTROL OF WORK AND MATERIALS

### PART 1 – GENERAL

Not Used.

### PART 2 – PRODUCTS

Not Used

### PART 3 - EXECUTION

### 3.01 HAULING, HANDLING AND STORAGE OF MATERIALS:

- A. The Contractor shall, at his own expense, handle and haul all materials furnished by him and shall remove any of his surplus materials at the completion of the work.
- B. The Contractor shall provide suitable and adequate storage for equipment and materials furnished by him that are liable to injury and shall be responsible for any loss of or damage to any equipment or materials by theft, breakage, or otherwise.
- C. All excavated materials and equipment to be incorporated in the Work shall be placed so as not to injure any part of the Work or existing facilities and so that free access can be had at all times to all parts of the Work and to all public utility installations in the vicinity of the work. Materials and equipment shall be kept neatly piled and compactly stored in such location as will cause a minimum of inconvenience to public travel and adjoining owners, tenants and occupants.
- D. The Contractor shall be responsible for all damages to the work under construction during its progress and until final completion and acceptance even though partial payments have been made under the Contract.
- E. Construction entrance shall be as marked on the Contract Documents and **will require a tracking pad / truck wash station** to ensure no debris leaves the site. Contractor is responsible for cleaning the streets should debris be tracked off site. A detail will be furnished within the conformed plan set.

### 3.02 OPEN EXCAVATIONS:

A. All open excavations shall be adequately safeguarded by providing temporary barricades, caution signs, lights and other means to prevent accidents to persons, and damage to property. The Contractor shall, at his own expense, provide suitable and safe means for

completely covering all open excavations and for accommodating travel when work is not in progress.

- B. Bridges provided for access to private property during construction shall be removed when no longer required.
- C. The length of open trench will be controlled by the particular surrounding conditions but shall always be confined to the limits prescribed by the Engineer.
- D. If the excavation becomes a hazard, or if it excessively restricts traffic at any point, then special construction procedures shall be taken, such as limiting the length of trench and prohibiting stocking excavated material in the street.
- E. All street excavations shall be completely closed at the end of each work day. Backfilling or use of steel plates of adequate strength to carry traffic shall be used.

# 3.03 MAINTENANCE OF TRAFFIC:

- A. Unless permission to close the street is received in writing from the proper authority, all excavated materials and equipment shall be placed so that vehicular and pedestrian traffic may be safely maintained at all times.
- B. The contractor is required by the Director of Traffic and Parking to have workforce carpool to the site in order to reduce traffic at the beginning and end of the work day. Director of Traffic and Parking deem it necessary, uniformed officers will be assigned to direct traffic. The Contractor shall make all arrangements in obtaining uniformed officers required.
- C. The Contractor shall at his own expense, as directed by the Police Traffic Control/Safety Officer, provide and erect acceptable barricades, barrier fences, traffic signs, and all other traffic devices not specifically covered in a bid item, to protect the work from traffic, pedestrians, and animals. He shall provide sufficient temporary lighting such as lanterns/flashers (electric battery operated) or other approved illuminated traffic signs and devices to afford adequate protection to the traveling public, at no additional cost to the Owner.
- D. The Contractor shall furnish all construction signs that are deemed necessary by and in accordance with Part VI of the <u>Manual on Uniform Traffic Control Devices</u> as published by the U.S. Department of Transportation. In addition, the Contractor may be required

to furnish up to 128 square feet of additional special construction warning signs. Size and exact wording of signs shall be determined by the Engineer during construction.

- E. The intent of policing is to ensure public safety by direction of traffic. Police officers are not to serve as watchmen to protect the Contractor's equipment and materials.
- F. Nothing contained herein shall be construed as relieving the Contractor of any of his responsibilities for protection of persons and property under the terms of the Contract.

### 3.04 CARE AND PROTECTION OF PROPERTY:

The Contractor shall be responsible for the preservation of all public and private property, and shall use every precaution necessary to prevent damage thereto. If any direct or indirect damage is done to public or private property by or on account of any act, omission, neglect, or misconduct in the execution of the work on the part of the Contractor, such property shall be promptly restored by the Contractor, at his expense, to a condition similar or equal to that existing before the damage was done, to the satisfaction of the Engineer.

- 3.05 PROTECTION AND RELOCATION OF EXISTING STRUCTURES AND UTILITIES:
  - A. All existing buildings, utilities, pipes, poles, wires fences, curbing, property line markers and other structures which the Engineer decides must be preserved in place without being temporarily or permanently relocated, shall be carefully supported and protected from

damage by the contractor. Should such property be damaged, it shall be restored by the Contractor, at no additional cost to the Owner.

- C. The Contractor shall determine the location of all underground structures and utilities (including existing water services, drain lines, electrical lines, and sewers). Services to
- D. buildings shall be maintained, and all costs or charges resulting from damage thereto shall be paid by Contractor.
- C. When fences interfere with the Contractor's operations, he shall remove and (unless otherwise specified) promptly restore them in accordance with the contract.
- D. On paved surfaces the Contractor shall not use or operate tractors, bulldozers, or other power-operated equipment with treads or wheels which are shaped so as to cut or otherwise damage such surfaces.
- E. All property damaged by the Contractor's operations shall be restored to a condition at least equal to that in which it was found immediately before work was begun. Suitable materials and methods shall be used for such restoration.
- F. Restoration of existing property and structures shall be carried out as promptly as practicable and shall not be left until the end of the construction period.
- 3.06 MAINTENANCE OF FLOW:
  - A. The Contractor shall at his own cost, provide for the flow of sewers and drains interrupted during the progress of the work, and shall immediately cart away and dispose of all offensive matter. The entire procedure of maintaining existing flow shall be fully discussed with the Engineer well in advance of the interruption of any flow.
  - B. All existing drainage facilities including, but not limited to; brooks, streams, canals, channels, ditches, culverts, catch basins and drainage piping shall be adequately safeguarded so as not to impede drainage or to cause siltation of downstream areas in any

manner whatsoever. If the Contractor damages or impairs any of the aforesaid drainage facilities, he shall repair the same within the same day.

C. At the conclusion of the work, the Contractor shall remove all silt in drainage structures caused by his operations as described in Section 01 74 00, CLEANING UP.

### 3.07 REJECTED MATERIALS AND DEFECTIVE WORK:

- A. Materials furnished by the Contractor and condemned by the Engineer as unsuitable or not in conformity with the specifications shall forthwith be removed from the work by the Contractor, and shall not be made use of elsewhere in the work.
- B. Any errors, defects or omissions in the execution of the work or in the materials furnished by the Contractor, even though they may have been passed or overlooked or have appeared after the completion of the work, discovered at any time before the final payment is made hereunder, shall be forthwith rectified and made good by and at the expense of the Contractor and in a manner satisfactory to the Engineer.
- C. The Contractor shall reimburse the Owner for any expense, losses or damages incurred in consequence of any defect, error, omission or act of the Contractor or his employees, as determined by the Engineer, occurring previous to the final payment.

### 3.08 SANITARY REGULATIONS:

Sanitary conveniences for the use of all persons employed on the work, properly screened from public observation, shall be provided in sufficient numbers in such manner and at such locations as may be approved. The contents shall be removed and disposed of in a satisfactory manner as the occasion requires. The Contractor shall rigorously prohibit the committing of nuisances within, on or about the work. Any employees found violating these provisions shall be discharged and not again employed on the work without the written consent of the Engineer. The sanitary conveniences specified above shall be the obligation and responsibility of the Contractor.

### 3.09 SAFETY AND HEALTH REGULATIONS:

This project is subject to the Safety and Health regulations of the U.S. Department of Labor set forth in 29 CFR, Part 1926, and to the Laws and Rules of the Commonwealth of Massachusetts Department of Labor. Contractors shall be familiar with the requirements of these regulations.

### 3.10 SITE INVESTIGATION:

The Contractor acknowledges that he has satisfied himself as to the conditions existing at the site of the work, the type of equipment required to perform this work, the quality and quantity of the materials furnished insofar as this information is reasonably ascertainable from an inspection of the site, as well as from information presented by the drawings and specifications made a part of this contract. Any failure of the Contractor to acquaint himself with available information will not relieve him from the responsibility for estimating properly the difficulty or cost of successfully performing the work. The Owner assumes no responsibility for any conclusion or interpretation made by the Contractor on the basis of the information made available by the Owner.

### 3.11 HANGERS, PADS, AND SUPPORTS:

- A. Unless otherwise indicated, hangers and supports shall be by the trade providing the supported item.
- B. Except where detailed or specified, design of hangers and supports shall be the responsibility of the Contractor. All parts of such hangers or supports shall be designed in accordance with accepted engineering practice, using a factor of safety of at least 2½.
- C. When proprietary hangers, etc., are supplied, satisfactory evidence of the strength of such items shall be furnished.
- D. Hangers for items hung from steel and concrete shall be centered on the vertical center of gravity of the beam.
- E. Locations and sizes of openings, sleeves, concrete pads, steel frames, and other equipment supports are indicated on the drawings for bidding purposes only. Final sizes and locations of such items shall be obtained from the shop drawings.
- 3.12 SLEEVES, HOLES, HANGERS, INSERTS, ETC.:
  - A. Except where holes and openings are dimensioned, and hangers, inserts, and supports are fully called for on the architectural and structural drawings (or reference is made thereon to drawings containing such information) to accommodate mechanical or electrical items, they shall be by the mechanical or electrical trade concerned.
  - B. Sleeves, inserts, anchors, etc., supplied under the mechanical and electrical contracts in sufficient time to so permit, shall be set in concrete, masonry, etc., or fastened to steel deck, etc., by the respective architectural or structural trade. Where not supplied in

sufficient time, installation of such items shall be the responsibility of the mechanical or electrical trade involved.

- C. Nothing shall be suspended from the steel roof deck and no fastenings made to it, except with the prior permission of the Engineer. Request for permission shall be accompanied by full details of the hanger or fastener, including the weight of the item to be suspended.
- D. Nailers and other wood members attached to steel or masonry, for which fasteners are not indicated on the design drawings or in the specification, shall be fastened with the equivalent of <sup>1</sup>/<sub>2</sub>-inch diameter bolts at 3 feet o.c.
- E. Openings for mechanical and electrical items in finished areas of the building shall be closed off with near escutcheon plates or similar closures. These closures shall be by the mechanical or electrical trade involved.

### 3.13 WORK PROTECTION:

Where work must be performed over completed work, the pavement shall be protected by 2 layers of ½-inch thick plywood, laid with joints in the second layer offset 1/2 sheet width and length from joints in the first layer. No material shall be stored or work performed on areas of completed site which are not so protected.

### 3.14 WEATHER PROTECTION:

In conformance with OSHA and the Massachusetts Department of Labor the General Contractor shall install weather protection and shall furnish adequate heat in the area so protected during the months of November through March.

### 3.15 ELECTRIC SERVICE:

- A. The Contractor shall make all necessary applications and arrangements and pay for all fees and charges for electrical energy for power and light necessary for the proper completion of this contract during its entire progress. The Contractor shall provide and pay for all temporary wiring, switches, connections, and meters.
- B. There shall be sufficient electric lighting so that all work may be done in a workmanlike manner where there is not sufficient daylight.

# PROJECT MEETINGS

### PART 1 - GENERAL:

### 1.01 GENERAL PROVISIONS

Attention is directed to the General Conditions of the Contract, all Divisions of the specifications, and the Contract Drawings, all of which apply to work of this section.

### 1.02 SCOPE OF WORK

Work included: To enable orderly review during progress of the Work, and to provide for systematic discussion of problems, if deemed necessary by the Landscape Architect/Engineer and Owner throughout the construction period. Related work: The Contractor's relations with his subcontractors and materials suppliers, and discussions relative thereto, are the Contractor's responsibility and normally are not part of Project Meetings content.

### 1.03 QUALITY ASSURANCE

For those persons designated by the Contractor to attend and participate in Project Meetings, provide required authority to commit the Contractor to solutions agreed upon in the Project Meetings.

# PART 2 - EXECUTION:

### 2.01 MEETING SCHEDULE

- A. Except as noted below for Preconstruction Meeting, frequency of Project Meetings will be weekly, or as determined by the Owner, depending on work progress.
- B. Coordinate as necessary, to establish mutually acceptable schedule for meetings.

### 2.02 MEETING LOCATIONS

Project Meetings will be held at the job sites, unless otherwise requested or indicated prior to meeting.

### 2.03 PRECONSTRUCTION MEETING

- A. The contractor shall arrange for a Preconstruction Meeting within 5 days after the award of contact. The limitations on the use of the premises, as outlined in SECTION 01010, SUMMARY OF WORK, will be discussed, and the Owner will describe the parking assignment, delivery procedures, toilet facilities, and other provisions he/she may wish to establish.
- B. Contractor is to coordinate attendance by authorized representatives of the Owner, the Contractor, site work subcontractors, and the Landscape Architect/Engineer.
- C. Minimum agenda: Data will be distributed and discussed on at least the following items:
  - 1. Organizational arrangement of Contractor's forces and personnel, and those of subcontractors, materials suppliers, and Owner.
  - 2. Channels and procedures for communication.
  - 3. Construction schedule, including sequence of critical work.
  - 4. Contract Documents and revisions.
  - 5. Processing of Shop Drawings and other data submitted to the Owner for review.
  - 6. Processing of Bulletins, field decisions, and Change Orders.
  - 7. Procedures for safety, first aid, security, quality control, housekeeping, and related matters.
  - 8. Submittal of Construction Fence layout.
  - 9. Submittal of Progress Schedule, Tabulation of Submittals and
  - 10. Schedule of Values.

### 2.04 PROJECT MEETINGS

A. Frequency: Project Meetings shall, in general, be held once a week. Meetings shall be chaired by the Landscape Architect/Engineer, who will also prepare the meeting agenda.

- B. Attendance:
  - 1. To the maximum extent practicable, assign the same person or persons to represent the Contractor at Project Meetings throughout progress of the Work.
  - 2. Site work subcontractors, material suppliers, and others may be required to attend those Project Meetings in which their aspect of the Work is involved.
- C. Minimum agenda:
  - 1. Review progress of the Work since last meeting, including status of submittals for approval.
  - 2. Identify problems which impede planned progress.
  - 3. Develop corrective measures and procedures to regain planned schedule.
  - 4. Complete other current business.
- D. Revisions to Minutes:
  - 1. Unless published minutes are challenged in writing prior to the next regularly scheduled Project Meeting, they will be accepted as properly stating the activities and decisions of the meeting.
  - 2. Persons challenging published minutes shall reproduce and distribute copies of the challenge to all indicated recipients of the particular set of minutes.
  - 3. Challenge to minutes shall be settled at start of the next regularly scheduled meeting.

### SUBMITTALS

### PART I - GENERAL

### 1.01 SCOPE OF WORK

- A. The work to be performed under this Section shall include the compilation and submittal of all required shop drawings, manufacturer's cuts, specifications, and certifications of all materials and equipment for the Engineer's approval. Actual product samples may also be required as stipulated in the technical specifications sections.
- B. All submittals shall be submitted in two (2) copies per General Conditions promptly after award of the contract, and shall be in not more than three (3) submittal packages so that a manual can be prepared for office and field reference. Alternatively, submittals may be made and distributed digitally with the approval of the Owner via email or File Transfer Protocol (FTP) site.

### PART II - SUBMITTALS

#### 2.01 REQUIREMENTS

- A. References are made throughout the specifications where submittals are required. All finishes, colors, and patterns are to be reviewed and approved by submittal or field sample.
- B. Where the Contractor's intention is to furnish the materials or equipment as specified, a list of all such elements, by Specification section, shall accompany the submittals so that the entire submittal is complete for the project.

### PART III - EXECUTION

- 3.01 Submit all documents and data in a collated, manual format, with six (6) manuals to be submitted. Include a Table of Contents of the material for reference. The submittal is to be entire and complete, addressing all furnishings and installation.
- 3.02 Submit all required product or material samples concurrent with the materials/equipment information manuals described above. Each submittal shall reference its appropriate specification section, part and paragraph.

# PERMITS

# PART I - GENERAL

### 1.01 DESCRIPTION:

This Section provides specific information and defines specific requirements of the Contractor regarding the preparation and acquisition of permits required to perform the work of this project.

### 1.02 SCOPE OF WORK

- A. The Contractor shall be responsible for obtaining all permits required to complete the work of this contract, to provide all coordination and furnish all bonds, assurances and required warranties. As applicable, the Contractor shall be responsible for any/all fees associated with the securing of permits necessary for the execution of the work of this contract. The Town of Natick will waive all Town associated fees.
- B. The Town has already secured an Order of Conditions from the Conservation Commission for this project, which is attached after this Section. The contractor shall comply with all requirements of the Order of Conditions.
- C. The Town has already secured Site Plan Approval and Land Disturbance Permits from the Planning Board for this project. The contractor shall comply with all requirements of both as necessary.

### 1.03 GENERAL REQUIREMENTS:

A. The Contractor shall perform the work in accordance with the Contract Documents, including the attached permits/order of conditions, and any applicable municipal requirements.

The Owner has obtained or will obtain and pay for the permits listed below, which are required for this project. The Contractor shall assist in obtaining certain permits, as indicated. The Contractor shall obtain and pay for all other permits required, as defined under the <u>Permits</u> subsection of Section 00410, GENERAL CONDITIONS.

Permits by Owner	<u>Status</u>
BWP AQ 06 Notification Prior to Construction or Demolition	*
Building Permit (as required)	*
Conservation Commission Order of Conditions (Ch. 131, s. 40)	(Attached)
Town of Natick Land Disturbance Permit	(Attached)
Backflow Preventers	*
Trench Permit (520 CMR 14.00)(eff. date 3/1/09)	*
Mass. Div. of WPC Sewer Extension or Connection Permit (314 CMR's 7.00 & 12.00)	*
**NPDES Construction General Permit	*
*Contractor shall prepare permit application and obtain the permit after contract is awarded, bearing all expenses. Owner will pay for and/or waive the permit application fee, if applicable.	

# 1.03 DIGSAFE

A. Contact Digsafe seventy-two (72) hours prior to initiating work at telephone # 1-888-344-7233.

# 1.04 CONSERVATION COMMISSION ORDERS:

The Conservation Commission has under the authority of Massachusetts General Laws Chapter 131, Section 40, issued an Order of Conditions on the work under this contract. This Order is to become a part of the Contract Documents and the Contractor shall perform all work in strict conformance with said Order. A copy of this Order is attached to this section.

# PART II - MATERIALS

A. All materials and equipment shall conform to permit requirements and the Town's standards for utilities, excavation, backfill, patching, and surveying or other work unless otherwise stated in these specifications. Coordinate as necessary with the appropriate Town official and/or private utility.

# 3.01 EXECUTION

- A. Execute all work per permit requirements. All plumbing and electric work to be approved by Town Inspectors. The Contractor shall perform the work in accordance with the Contract Documents, including the attached permits/order of conditions, and any applicable municipal requirements.
- B. Prior to commencing any construction activities, the Contractor shall demonstrate to the Owner and the Engineer, through on-site inspection and submitting copies of permits or approvals, that it is in full compliance with the terms and conditions of all permits specified herein. The Contractor shall maintain full compliance with all permits throughout the performance of the work, and upon request, grant access to permitting authorities to inspect the site for the purpose of verifying such compliance.

# 4.01 GUARANTEE

A. Guarantee all work per permit requirements.



# Massachusetts Department of Environmental Protection Bureau of Resource Protection - Wetlands WPA Form 5 – Order of Conditions

Provided by MassDEP: 233-778 MassDEP File #

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

eDEP Transaction # Natick City/Town

# A. General Information

Please note:	_	Natick							
this form has been modified	1. From:	Conservation Commissio	'n						
with added space to accommodate	2. This iss (check	suance is for one):	a. 🖾 Order of	Con	ditions ъ.[	] Amer	nded Ord <b>e</b>	r of Conditi	ions
the Registry of Deeds Requirements	з. То: А	pplicant:							
·	Jemn	าล			Lambert				
Important:	a. First	Name			b. Last Nan	ne			
When filling		nunity Services Dept.							
out forms on	c. Orga	anization							
the computer,		ast Central Street							
use only the	d. Mail	ing Address							
tab key to	Natic				MA			01760	
move your cursor - do	e. City/	Town			f. State			g. Zip Cod	е
not use the return key.	4. Propert	y Owner (if different fro	om applicant):		,				
	a, First	Name		_	b. Last Nan	ne			
	Town	of Natick							
	c. Orga	anization					•		
rətum	13 Ea	ast Central Street							
,	d. Mail	ing Address							
	Natic	k			MA			01760	
	e. City/	Town			f. State			g. Zip Cod	e
	5. Project	Location:							
	90 Oa	ak Street			Natick				
	a. Stre	et Address			b. City/Tow	n			
	21				00002430	C, 00002	234B, 000	0243A	
	c. Asse	essors Map/Plat Number			d. Parcel/Lo	ot Number			
	Latitu	de and Longitude, if kr		d	m	\$	d	m	<u>s</u>
	Ladu	ue anu Longitude, il M	d. La	atitude	9		e. Longitu	de	



# Massachusetts Department of Environmental Protection

Bureau of Resource Protection - Wetlands

# WPA Form 5 – Order of Conditions

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:
233-778
MassDEP File #

eDEP Transaction # Natick City/Town

# A. General Information (cont.)

6. Property recorded at the Registry of Deeds for (attach additional information if more than one parcel):

	Middlese	X		
	a. County		b. Certificate Number (if re	egistered land)
	04810		00566	
	c. Book		d. Page	
7.	Dates:	August 10, 2017 a. Date Notice of Intent Filed	December 26, 2017 b. Date Public Hearing Closed	January 12, 2018 c. Date of Issuance
8.	as neede		ments (attach additional plan c	or document references

a. Plan Title		
Weston & Sampson	Eugene Bolling	er, PE
b. Prepared By	c. Signed and Starr	nped by
August 2017	1''=20'	
d. Final Revision Date	e. Scale	
Planting Plan		November 2017
f. Additional Plan or Document Title		g. Date

# **B.** Findings

1. Findings pursuant to the Massachusetts Wetlands Protection Act:

Following the review of the above-referenced Notice of Intent and based on the information provided in this application and presented at the public hearing, this Commission finds that the areas in which work is proposed is significant to the following interests of the Wetlands Protection Act (the Act). Check all that apply:

a.	Public Water Supply	b.	Land Containing Shellfish	с.	Prevention of Pollution
d.	Private Water Supply	e.	Fisheries	f.	Protection of Wildlife Habitat
g.	Groundwater Supply	h.	Storm Damage Prevention	i.	Flood Control

2. This Commission hereby finds the project, as proposed, is: (check one of the following boxes)

#### Approved subject to:

a. A the following conditions which are necessary in accordance with the performance standards set forth in the wetlands regulations. This Commission orders that all work shall be performed in accordance with the Notice of Intent referenced above, the following General Conditions, and any other special conditions attached to this Order. To the extent that the following conditions modify or differ from the plans, specifications, or other proposals submitted with the Notice of Intent, these conditions shall control.



Massachusetts Department of Environmental Protection Bureau of Resource Protection - Wetlands

WPA Form 5 – Order of Conditions

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP: 233-778 MassDEP File #

eDEP Transaction # Natick City/Town

# B. Findings (cont.)

#### Denied because:

- b. I the proposed work cannot be conditioned to meet the performance standards set forth in the wetland regulations. Therefore, work on this project may not go forward unless and until a new Notice of Intent is submitted which provides measures which are adequate to protect the interests of the Act, and a final Order of Conditions is issued. A description of the performance standards which the proposed work cannot meet is attached to this Order.
- c. the information submitted by the applicant is not sufficient to describe the site, the work, or the effect of the work on the interests identified in the Wetlands Protection Act. Therefore, work on this project may not go forward unless and until a revised Notice of Intent is submitted which provides sufficient information and includes measures which are adequate to protect the Act's interests, and a final Order of Conditions is issued. A description of the specific information which is lacking and why it is necessary is attached to this Order as per 310 CMR 10.05(6)(c).
- 3. Buffer Zone Impacts: Shortest distance between limit of project <u>15</u> disturbance and the wetland resource area specified in 310 CMR 10.02(1)(a) <u>a. linear feet</u>

Inland Resource Area Impacts: Check all that apply below. (For Approvals Only)

Resource Area	Proposed Alteration	Permitted Alteration	Proposed Replacement	Permitted Replacement
4. 🔲 Bank	a. linear feet	b. linear feet	c. linear feet	d. linear feet
5. Bordering Vegetated Wetland 6. Land Under	a. square feet	b. square feet	c. square feet	d. square feet
<ol> <li>Land Under Waterbodies and Waterways</li> </ol>	a. square feet	b. square feet	c. square feet	d. square feet
_	e. c/y dredged	f. c/y dredged		
<ol> <li>Bordering Land Subject to Flooding</li> </ol>	a. square feet	b. square feet	c. square feet	d. square feet
Cubic Feet Flood Storage	e. cubic feet	f. cubic feet	g. cubic feet	h. cubic feet
<ol> <li>Isolated Land Subject to Flooding</li> </ol>	a. square feet	b. square feet		
Cubic Feet Flood Storage	c. cubic feet	d. cubic feet	e. cubic feet	f. cubic feet
9. 🔲 Riverfront Area	a. total sq. feet	b. total sq. feet		
Sq ft within 100 ft	c. square feet	d. square feet	e. square feet	f. square feet
Sq ft between 100- 200 ft	g. square feet	h. square feet	i. square feet	j. square feet



# Massachusetts Department of Environmental Protection Bureau of Resource Protection - Wetlands

# WPA Form 5 – Order of Conditions

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:
233-778
MassDEP File #

eDEP Transaction # Natick City/Town

# B. Findings (cont.)

Coastal Resource Area Imp	acts: Check all th	at apply below.	(For Approvals	Only)
	Proposed Alteration	Permitted Alteration	Proposed Replacement	Permitted Replacement
10. Designated Port Areas	Indicate size u	inder Land Unde	er the Ocean, bel	ow
11. Land Under the Ocean	a. square feet	b. square feet		
	c. c/y dredged	d. c/y dredged		
12. 🗌 Barrier Beaches	Indicate size u below	inder Coastal Be	eaches and/or Co	oastal Dunes
13. 🗌 Coastal Beaches	a. square feet	b. square feet	cu yd c. nourishment	cu yd d. nourishment
14. 🔲 Coastal Dunes	a. square feet	b. square feet	cu yd c. nourishment	cu yd d. nourishment
15. 🔲 Coastal Banks	a. linear feet	b. linear feet		
16. 🔲 Rocky Intertidal Shores	a. square feet	b. square feet		
17. 🗌 Salt Marshes	a. square feet	b. square feet	c. square feet	d. square feet
18. 🔲 Land Under Salt Ponds	a. square feet	b. square feet		
	c. c/y dredged	d. c/y dredged		
19. 🔲 Land Containing Shellfish	a. square feet	b. square feet	c. square feet	d. square feet
20. 🔲 Fish Runs		d/or inland Land	anks, Inland Banl I Under Waterbo	
	a. c/y dredged	b. c/y dredged		
21. 🔲 Land Subject to Coastal Storm Flowage	a. square feet	b. square feet		
22. 🔲 Riverfront Area	a. total sq. feet	b. total sq. feet		
Sq ft within 100 ft	c. square feet	d. square feet	e. square feet	f. square feet
Sq ft between 100- 200 ft	g. square feet	h. square feet	i. square feet	j. square feet



# Massachusetts Department of Environmental Protection

Bureau of Resource Protection - Wetlands

# WPA Form 5 – Order of Conditions

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:	
233-778	
MassDEP File #	

eDEP Transaction # Natick City/Town

# B. Findings (cont.)

\* #23. If the 23. project is for the purpose of restoring or enhancing a wetland in addition to the square footage that has been entered in Section B.5.c (BVW) or B.17.c (Salt Marsh) above, 1 please enter the additional amount here. 2,

Restoration/Enhancement *:

a. square feet of BVW

resource area 24. Stream Crossing(s):

b. square feet of salt marsh

a. number of new stream crossings

b. number of replacement stream crossings

# C. General Conditions Under Massachusetts Wetlands Protection Act

#### The following conditions are only applicable to Approved projects.

- 1. Failure to comply with all conditions stated herein, and with all related statutes and other regulatory measures, shall be deemed cause to revoke or modify this Order.
- 2. The Order does not grant any property rights or any exclusive privileges; it does not authorize any injury to private property or invasion of private rights.
- 3. This Order does not relieve the permittee or any other person of the necessity of complying with all other applicable federal, state, or local statutes, ordinances, bylaws, or regulations.
- 4. The work authorized hereunder shall be completed within three years from the date of this Order unless either of the following apply:
  - a. The work is a maintenance dredging project as provided for in the Act; or
  - b. The time for completion has been extended to a specified date more than three years, but less than five years, from the date of issuance. If this Order is intended to be valid for more than three years, the extension date and the special circumstances warranting the extended time period are set forth as a special condition in this Order.
  - c. If the work is for a Test Project, this Order of Conditions shall be valid for no more than one year.
- 5. This Order may be extended by the issuing authority for one or more periods of up to three years each upon application to the issuing authority at least 30 days prior to the expiration date of the Order. An Order of Conditions for a Test Project may be extended for one additional year only upon written application by the applicant, subject to the provisions of 310 CMR 10.05(11)(f).
- 6. If this Order constitutes an Amended Order of Conditions, this Amended Order of Conditions does not extend the issuance date of the original Final Order of Conditions and the Order will expire on <u>1-12-23</u> unless extended in writing by the Department.
- 7. Any fill used in connection with this project shall be clean fill. Any fill shall contain no trash, refuse, rubbish, or debris, including but not limited to lumber, bricks, plaster, wire, lath, paper, cardboard, pipe, tires, ashes, refrigerators, motor vehicles, or parts of any of the foregoing.



# Massachusetts Department of Environmental Protection Bureau of Resource Protection - Wetlands WPA Form 5 – Order of Conditions

Provided by MassDEP: 233-778 MassDEP File #

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

eDEP Transaction # Natick City/Town

### C. General Conditions Under Massachusetts Wetlands Protection Act

- 8. This Order is not final until all administrative appeal periods from this Order have elapsed, or if such an appeal has been taken, until all proceedings before the Department have been completed.
- 9. No work shall be undertaken until the Order has become final and then has been recorded in the Registry of Deeds or the Land Court for the district in which the land is located, within the chain of title of the affected property. In the case of recorded land, the Final Order shall also be noted in the Registry's Grantor Index under the name of the owner of the land upon which the proposed work is to be done. In the case of the registered land, the Final Order shall also be noted on the Land Court Certificate of Title of the owner of the land upon which the proposed work is done. The recording information shall be submitted to the Conservation Commission on the form at the end of this Order, which form must be stamped by the Registry of Deeds, prior to the commencement of work.
- 10. A sign shall be displayed at the site not less then two square feet or more than three square feet in size bearing the words,

"Massachusetts Department of Environmental Protection" [or, "MassDEP"]

"File Number 233-778

- 11. Where the Department of Environmental Protection is requested to issue a Superseding Order, the Conservation Commission shall be a party to all agency proceedings and hearings before MassDEP.
- 12. Upon completion of the work described herein, the applicant shall submit a Request for Certificate of Compliance (WPA Form 8A) to the Conservation Commission.
- 13. The work shall conform to the plans and special conditions referenced in this order.
- 14. Any change to the plans identified in Condition #13 above shall require the applicant to inquire of the Conservation Commission in writing whether the change is significant enough to require the filing of a new Notice of Intent.
- 15. The Agent or members of the Conservation Commission and the Department of Environmental Protection shall have the right to enter and inspect the area subject to this Order at reasonable hours to evaluate compliance with the conditions stated in this Order, and may require the submittal of any data deemed necessary by the Conservation Commission or Department for that evaluation.
- 16. This Order of Conditions shall apply to any successor in interest or successor in control of the property subject to this Order and to any contractor or other person performing work conditioned by this Order.



### Massachusetts Department of Environmental Protection Bureau of Resource Protection - Wetlands WPA Form 5 – Order of Conditions

Provided by MassDEP: 233-778 MassDEP File #

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

eDEP Transaction # Natick City/Town

### C. General Conditions Under Massachusetts Wetlands Protection Act (cont.)

- 17. Prior to the start of work, and if the project involves work adjacent to a Bordering Vegetated Wetland, the boundary of the wetland in the vicinity of the proposed work area shall be marked by wooden stakes or flagging. Once in place, the wetland boundary markers shall be maintained until a Certificate of Compliance has been issued by the Conservation Commission.
- 18. All sedimentation barriers shall be maintained in good repair until all disturbed areas have been fully stabilized with vegetation or other means. At no time shall sediments be deposited in a wetland or water body. During construction, the applicant or his/her designee shall inspect the erosion controls on a daily basis and shall remove accumulated sediments as needed. The applicant shall immediately control any erosion problems that occur at the site and shall also immediately notify the Conservation Commission, which reserves the right to require additional erosion and/or damage prevention controls it may deem necessary. Sedimentation barriers shall serve as the limit of work unless another limit of work line has been approved by this Order.
- 19. The work associated with this Order (the "Project")

(1) is subject to the Massachusetts Stormwater Standards

(2) is NOT subject to the Massachusetts Stormwater Standards

# If the work is subject to the Stormwater Standards, then the project is subject to the following conditions:

a) All work, including site preparation, land disturbance, construction and redevelopment, shall be implemented in accordance with the construction period pollution prevention and erosion and sedimentation control plan and, if applicable, the Stormwater Pollution Prevention Plan required by the National Pollution Discharge Elimination System Construction General Permit as required by Stormwater Condition 8. Construction period erosion, sedimentation and pollution control measures and best management practices (BMPs) shall remain in place until the site is fully stabilized.

b) No stormwater runoff may be discharged to the post-construction stormwater BMPs unless and until a Registered Professional Engineer provides a Certification that:

*i.* all construction period BMPs have been removed or will be removed by a date certain specified in the Certification. For any construction period BMPs intended to be converted to post construction operation for stormwater attenuation, recharge, and/or treatment, the conversion is allowed by the MassDEP Stormwater Handbook BMP specifications and that the BMP has been properly cleaned or prepared for post construction operation, including removal of all construction period sediment trapped in inlet and outlet control structures; *ii.* as-built final construction BMP plans are included, signed and stamped by a Registered Professional Engineer, certifying the site is fully stabilized;

*iii.* any illicit discharges to the stormwater management system have been removed, as per the requirements of Stormwater Standard 10;



# Massachusetts Department of Environmental Protection Bureau of Resource Protection - Wetlands

WPA Form 5 – Order of Conditions

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:
233-778
MassDEP File #

eDEP Transaction # Natick City/Town

### C. General Conditions Under Massachusetts Wetlands Protection Act (cont.)

*iv.* all post-construction stormwater BMPs are installed in accordance with the plans (including all planting plans) approved by the issuing authority, and have been inspected to ensure that they are not damaged and that they are in proper working condition;

v. any vegetation associated with post-construction BMPs is suitably established to withstand erosion.

c) The landowner is responsible for BMP maintenance until the issuing authority is notified that another party has legally assumed responsibility for BMP maintenance. Prior to requesting a Certificate of Compliance, or Partial Certificate of Compliance, the responsible party (defined in General Condition 18(e)) shall execute and submit to the issuing authority an Operation and Maintenance Compliance Statement ("O&M Statement) for the Stormwater BMPs identifying the party responsible for implementing the stormwater BMP Operation and Maintenance Plan ("O&M Plan") and certifying the following:

i.) the O&M Plan is complete and will be implemented upon receipt of the Certificate of Compliance, and

ii.) the future responsible parties shall be notified in writing of their ongoing legal responsibility to operate and maintain the stormwater management BMPs and implement the Stormwater Pollution Prevention Plan.

d) Post-construction pollution prevention and source control shall be implemented in accordance with the long-term pollution prevention plan section of the approved Stormwater Report and, if applicable, the Stormwater Pollution Prevention Plan required by the National Pollution Discharge Elimination System Multi-Sector General Permit.

e) Unless and until another party accepts responsibility, the landowner, or owner of any drainage easement, assumes responsibility for maintaining each BMP. To overcome this presumption, the landowner of the property must submit to the issuing authority a legally binding agreement of record, acceptable to the issuing authority, evidencing that another entity has accepted responsibility for maintaining the BMP, and that the proposed responsible party shall be treated as a permittee for purposes of implementing the requirements of Conditions 18(f) through 18(k) with respect to that BMP. Any failure of the proposed responsible party to implement the requirements of Conditions or Certificate of Compliance. In the case of stormwater BMPs that are serving more than one lot, the legally binding agreement shall also identify the lots that will be serviced by the stormwater BMPs. A plan and easement deed that grants the responsible party access to perform the required operation and maintenance must be submitted along with the legally binding agreement.

f) The responsible party shall operate and maintain all stormwater BMPs in accordance with the design plans, the O&M Plan, and the requirements of the Massachusetts Stormwater Handbook.



# Massachusetts Department of Environmental Protection

Bureau of Resource Protection - Wetlands

WPA Form 5 – Order of Conditions

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP: 233-778 MassDEP File #

eDEP Transaction # Natick City/Town

### C. General Conditions Under Massachusetts Wetlands Protection Act (cont.)

- g) The responsible party shall:
  - 1. Maintain an operation and maintenance log for the last three (3) consecutive calendar years of inspections, repairs, maintenance and/or replacement of the stormwater management system or any part thereof, and disposal (for disposal the log shall indicate the type of material and the disposal location);
  - 2. Make the maintenance log available to MassDEP and the Conservation Commission ("Commission") upon request; and
  - 3. Allow members and agents of the MassDEP and the Commission to enter and inspect the site to evaluate and ensure that the responsible party is in compliance with the requirements for each BMP established in the O&M Plan approved by the issuing authority.

h) All sediment or other contaminants removed from stormwater BMPs shall be disposed of in accordance with all applicable federal, state, and local laws and regulations.

i) Illicit discharges to the stormwater management system as defined in 310 CMR 10.04 are prohibited.

j) The stormwater management system approved in the Order of Conditions shall not be changed without the prior written approval of the issuing authority.

k) Areas designated as qualifying pervious areas for the purpose of the Low Impact Site Design Credit (as defined in the MassDEP Stormwater Handbook, Volume 3, Chapter 1, Low Impact Development Site Design Credits) shall not be altered without the prior written approval of the issuing authority.

I) Access for maintenance, repair, and/or replacement of BMPs shall not be withheld. Any fencing constructed around stormwater BMPs shall include access gates and shall be at least six inches above grade to allow for wildlife passage.

Special Conditions (if you need more space for additional conditions, please attach a text document):

#### See special conditions

20. For Test Projects subject to 310 CMR 10.05(11), the applicant shall also implement the monitoring plan and the restoration plan submitted with the Notice of Intent. If the conservation commission or Department determines that the Test Project threatens the public health, safety or the environment, the applicant shall implement the removal plan submitted with the Notice of Intent or modify the project as directed by the conservation commission or the Department.



#### Massachusetts Department of Environmental Protection Bureau of Resource Protection - Wetlands

Provided by MassDEP: 233-778 MassDEP File #

# WPA Form 5 – Order of Conditions

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

eDEP Transaction # Natick City/Town

# D. Findings Under Municipal Wetlands Bylaw or Ordinance

- 1. Is a municipal wetlands bylaw or ordinance applicable? 🛛 Yes 🗌 No
- 2. The <u>Natick</u> hereby finds (check one that applies): Conservation Commission
  - a. I that the proposed work cannot be conditioned to meet the standards set forth in a municipal ordinance or bylaw, specifically:

1. Municipal Ordinance or Bylaw

Therefore, work on this project may not go forward unless and until a revised Notice of Intent is submitted which provides measures which are adequate to meet these standards, and a final Order of Conditions is issued.

b. In that the following additional conditions are necessary to comply with a municipal ordinance or bylaw:
 Natick Wetlands Bylaw

1. Municipal Ordinance or Bylaw

2. Citation

2. Citation

3. The Commission orders that all work shall be performed in accordance with the following conditions and with the Notice of Intent referenced above. To the extent that the following conditions modify or differ from the plans, specifications, or other proposals submitted with the Notice of Intent, the conditions shall control.

The special conditions relating to municipal ordinance or bylaw are as follows (if you need more space for additional conditions, attach a text document):



# Massachusetts Department of Environmental Protection Bureau of Resource Protection - Wetlands

# WPA Form 5 – Order of Conditions

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP: 233-778 MassDEP File #

eDEP Transaction # Natick City/Town

# E. Signatures

This Order is valid for three years, unless otherwise specified as a special condition pursuant to General Conditions #4, from the date of issuance.

1. Date of Issuance 2. Number of Signers

Please indicate the number of members who will sign this form. This Order must be signed by a majority of the Conservation Commission.

The Order must be mailed by certified mail (return receipt requested) or hand delivered to the applicant. A copy also must be mailed or hand delivered at the same time to the appropriate Department of Environmental Protection Regional Office, if not filing electronically, and the property owner, if different

om applicant.	
ignatures: A Mund B-	Dom Sternet
	- pory sveper
by hand delivery on	by certified mail, return receipt requested, on $I - I - I $
Date	Date

# F. Appeals

The applicant, the owner, any person aggrieved by this Order, any owner of land abutting the land subject to this Order, or any ten residents of the city or town in which such land is located, are hereby notified of their right to request the appropriate MassDEP Regional Office to issue a Superseding Order of Conditions. The request must be made by certified mail or hand delivery to the Department, with the appropriate filing fee and a completed Request for Departmental Action Fee Transmittal Form, as provided in 310 CMR 10.03(7) within ten business days from the date of issuance of this Order. A copy of the request shall at the same time be sent by certified mail or hand delivery to the Conservation Commission and to the applicant, if he/she is not the appellant.

Any appellants seeking to appeal the Department's Superseding Order associated with this appeal will be required to demonstrate prior participation in the review of this project. Previous participation in the permit proceeding means the submission of written information to the Conservation Commission prior to the close of the public hearing, requesting a Superseding Order, or providing written information to the Department prior to issuance of a Superseding Order.

The request shall state clearly and concisely the objections to the Order which is being appealed and how the Order does not contribute to the protection of the interests identified in the Massachusetts Wetlands Protection Act (M.G.L. c. 131, § 40), and is inconsistent with the wetlands regulations (310 CMR 10.00). To the extent that the Order is based on a municipal ordinance or bylaw, and not on the Massachusetts Wetlands Protection Act or regulations, the Department has no appellate jurisdiction.



# Massachusetts Department of Environmental Protection

Bureau of Resource Protection - Wetlands

# WPA Form 5 – Order of Conditions

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:
233-778
MassDEP File #

eDEP Transaction # Natick City/Town

# G. Recording Information

Prior to commencement of work, this Order of Conditions must be recorded in the Registry of Deeds or the Land Court for the district in which the land is located, within the chain of title of the affected property. In the case of recorded land, the Final Order shall also be noted in the Registry's Grantor Index under the name of the owner of the land subject to the Order. In the case of registered land, this Order shall also be noted on the Land Court Certificate of Title of the owner of the land subject to the Order of Conditions. The recording information on this page shall be submitted to the Conservation Commission listed below.

Conservation Commission		annin ar 1
Detach on dotted line, have stamped by the Regi Commission.		
To:		
Conservation Commission		
Please be advised that the Order of Conditions f	or the Project at:	
Project Location	MassDEP File Nu	mber
Has been recorded at the Registry of Deeds of:		
County	Book	Page
for: Property Owner		
and has been noted in the chain of title of the af	fected property in:	
Book	Page	
In accordance with the Order of Conditions issue	ed on:	
Date		
If recorded land, the instrument number identifyi	ng this transaction	is:
Instrument Number		
If registered land, the document number identify	ing this transactior	ı is:
Document Number	<u></u>	
Signature of Applicant		



Massachusetts Department of Environmental Protection Bureau of Resource Protection - Wetlands **Request for Departmental Action Fee Transmittal Form** Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

# A. Request Information

1. Location of Project

a. Street Address	b. City/Town, Zip
c. Check number	d. Fee amount
Person or party making request (if appropriate, na	me the citizen group's representative):

When filling out forms on the computer, use only the tab k mov curse not u

2.

Name

Important:

use only the		
tab key to move your		Mailing Address
cursor - do not use the		City/Town
return key.		Phone Number
	3.	Applicant (as shown on Determination of App (Form 4B), Order of Conditions (Form 5), Res Non-Significance (Form 6)):
<del>,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,</del>		Name
		Mailing Address

Applicant (as shown on Determination of Applicability (Form 2), Order of Resource Area Delineati (Form 4B), Order of Conditions (Form 5), Restoration Order of Conditions (Form 5A), or Notice of Non-Significance (Form 6)):					
Name					
Mailing Address					
City/Town	State	Zip Code			
Phone Number	Fax Number (if ap	Fax Number (if applicable)			
DEP File Number:					

State

Fax Number (if applicable)

# **B. Instructions**

- 1. When the Departmental action request is for (check one):
  - Superseding Order of Conditions Fee: \$120.00 (single family house projects) or \$245 (all other projects)
  - Superseding Determination of Applicability Fee: \$120
  - Superseding Order of Resource Area Delineation Fee: \$120

4.

DEP File Number:

Provided by DEP

Zip Code



# Massachusetts Department of Environmental Protection Bureau of Resource Protection - Wetlands Request for Departmental Action Fee Transmittal Form Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

DEP File Number:

Provided by DEP

# B. Instructions (cont.)

Send this form and check or money order, payable to the Commonwealth of Massachusetts, to:

Department of Environmental Protection Box 4062 Boston, MA 02211

- 2. On a separate sheet attached to this form, state clearly and concisely the objections to the Determination or Order which is being appealed. To the extent that the Determination or Order is based on a municipal bylaw, and not on the Massachusetts Wetlands Protection Act or regulations, the Department has no appellate jurisdiction.
- 3. Send a **copy** of this form and a **copy** of the check or money order with the Request for a Superseding Determination or Order by certified mail or hand delivery to the appropriate DEP. Regional Office (see <u>http://www.mass.gov/eea/agencies/massdep/about/contacts/</u>).
- 4. A copy of the request shall at the same time be sent by certified mail or hand delivery to the Conservation Commission and to the applicant, if he/she is not the appellant.

### QUALITY CONTROL

### PART 1 - GENERAL:

### 1.01 GENERAL PROVISIONS

Attention is directed to the General Conditions of the Contract, all Divisions of the Specifications and the Drawings, all of which apply to this section.

### 1.02. SCOPE OF WORK

- A. The scope of the work under this Specification section, without limiting the generality thereof, includes the furnishing of all labor, materials, equipment, services, and incidentals necessary to complete all of the work in accordance with the Contract Documents, which are intended to describe and provide for a finished piece of work.
- B. The work includes the following, without limiting the generality thereof;
  - 1. The making available to the Owner's testing laboratory any samples or specimens which the laboratory may require to perform quality control testing on concrete, fill materials, or other material as the Owner may elect.
  - 2. The coordinating and scheduling of work and the giving of timely notice so as to afford the Owner's testing laboratory the opportunity to take samples and make observations or tests.
  - 3. Provide safe access to the site or area for the Owner's agent to collect data, samples, and the like.

# 1.03. TESTING LABORATORY

- A. The Owner will select, engage, and pay for the services of an independent testing laboratory to perform structural tests on concrete, soil testing, compaction testing and such other materials as the Landscape Architect/Engineer may deem appropriate.
- B. Retesting of materials which fail the original test shall be paid for by the Contractor.

### SAMPLING & TESTING

### PART I - GENERAL

### 1.01 SCOPE OF WORK

A. In the event that Owner testing discovers unsatisfactory work, the Contractor shall conduct any additional testing in accordance with this specification. The work under this Section shall consist of performing or ordering the work of collecting samples for testing, having tests performed by a Certified Testing Laboratory satisfactory to the Engineer, having all test results forwarded to the Engineer for approval, and paying all costs associated with the collection and sampling, transportation, shipping, postage, and testing, and the coordination of test results and approvals.

### 1.02 SUBMITTALS

A. In accordance with Section 01330 of these Specifications, submit the names, addresses and certification of laboratories to be utilized for approval by the Engineer.

#### PART II - MATERIALS

#### 2.01 CONTAINERS AND TOOLS

A. Utilize tools recommended by the laboratory to obtain samples, packaging or containers suitable to, or furnished by, the laboratory, and collect all samples in the proper number and quantity to permit tests to be conducted.

### 2.02 TESTS

- A. Refer to Section specifications for test requirements and criteria for results; coordinate with the Owner's Representative.
- B. All building utilities, park elements, play/fitness equipment, locking gates, lighting systems, and any other components from the scope of work as requested by the Owner's Representative shall be tested to ensure complete compliance with manufacturer's installation instructions and warrantee requirements.

# PART III - EXECUTION

# 3.01 METHODOLOGY

- A. Unless otherwise directed by the Section specifications, perform sampling and testing will be ordered by the Contractor and approved by the Owner's Representative. Locations, number and quantity of samples shall be submitted for approval as directed in accordance with the Specifications.
- B. Sampling and Testing results must be provided to the Owner's Representative and Approved prior to the installation of any work potentially impacted by unacceptable test results.

# 3.02 PAYMENT

A. Payment for additional sampling and testing efforts shall be included in the lump sum contract price bid.

### TEMPORARY FACILITIES

### PART 1 - GENERAL:

### 1.01 GENERAL PROVISIONS

Attention is directed to the General Conditions of the Contract, all Divisions of the Specifications and the Contract Drawings, all of which apply to this section.

#### 1.02 SCOPE OF WORK

- A. The scope of the work under this Specification section, without limiting the generality thereof, includes the furnishing of all labor, materials, equipment, services, and incidentals necessary to complete all of the work in accordance with the Contract Documents, which are intended to describe and provide for a finished piece of work.
- B. The work includes the following, without limiting the generality thereof;
  - 1. Temporary utilities.
  - 2. Field office (not required).
  - 3. Barriers and enclosures.
  - 4. Safety and security.

### 1.02. TEMPORARY UTILITIES

- A. The Contractor is responsible for all temporary electrical distribution, lighting, and water distribution from existing sources.
- B. The Contractor shall provide and pay for his own temporary telephone service within the Contract Limit Line.
- C. The provision for temporary toilets is included under SECTION 01010 SUMMARY OF WORK.

### 1.03 FIELD OFFICE

- A. The contractor is responsible for his/her own office space, if deemed necessary.
- B. The Contractor shall provide appropriate survey equipment on site for use by the Engineer, field checking layouts and installations.

### 1.04 BARRIERS AND ENCLOSURES

A. The Contractor shall maintain the construction fence if required by the Owner and furnish warning signs around the work area to limit unauthorized entry within the Contract Limit Line.

#### 01500-1 TEMPORARY FACILITIES

B. At the earliest practical time provide temporary enclosure of materials, equipment, work in progress and completed portions of the work to provide protection to the work and employees.

### 1.05 SAFETY AND SECURITY

- A. The Contractor shall be responsible for the safety and security of the buildings and the site within the Contract Limit Line, and for the safety of all persons who enter within the Contract Limit Line.
- B. The Contractor shall be responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the work.
- C. The Contractor shall erect and maintain, as required by existing conditions and progress of the work, all reasonable safeguards for safety and protection, including posting danger signs and other warnings against hazards, promulgating safety regulations, and notifying the Owner of particular hazards.
- D. The Contractor shall cooperate with and maintain a close liaison with the Police Department and Fire Department, and he shall abide by safety-related requests from any of these agencies.

# DUST CONTROL

# PART 1- GENERAL

### 1.01 DESCRIPTION

This section of the specification covers the control of dust via calcium chloride and water, complete.

### 1.02 CALCIUM CHLORIDE

- A. Calcium chloride shall conform to the requirements of AASHTO-M 144, Type I or Type II and Specification for Calcium Chloride, ASTM D98. The calcium chloride shall be packaged in moisture proof bags or in airtight drums with the name of manufacturer, name of product, net weight, and percentage of calcium chloride guaranteed by the manufacturer, legibly marked on each container.
- B. Calcium chloride failing to meet the requirements of the aforementioned specifications or that which has become caked or sticky in shipment may be rejected by the Engineer.

### 1.03 WATER

A. Water shall not be brackish and shall be free from oil, acid, and injurious alkali or vegetable matter.

### 1.04 APPLICATION

- A. Calcium chloride shall be applied when ordered by the Engineer and only in areas which will not be adversely affected by the application. See Section 01570, ENVIRONMENTAL PROTECTION.
- B. Calcium chloride shall be uniformly applied at the rate of 1-1/2 pounds per square yard or at any other rate as directed by the Engineer. Application shall be by means of a mechanical spreader, or other approved methods. The number and frequency of applications shall be determined by the Engineer.
- C. Water may be sprinkler applied with equipment including a tank with gauge-equipped pressure pump and a nozzle-equipped spray bar.
- D. Water shall be dispersed through the nozzle under a minimum pressure of 20 pounds per square inch, gauge pressure.

# END OF SECTION

01562-1 DUST CONTROL

### ENVIRONMENTAL PROTECTION

### 1.01 DESCRIPTION

- A. The work covered by this section of the specifications consists of furnishing all labor, materials, tools and equipment and performing all work required for the prevention of environmental pollution during and as a result of construction operations under this contract.
- B. The requirements set forth in this section of the specifications apply to construction in and adjacent to wetlands & environmental resources, unless otherwise specifically stated.
- C. All work under this Contract shall be in accordance with the Conservation Commissions' Order of Conditions (and Land Disturbance Permit) as well as any conditional requirements applied, all of which are attached to Special Conditions Section PERMITS.

### 1.02 NOTIFICATION

The Engineer or Owner will notify the Contractor in writing of any non-compliance with the foregoing provisions. The Contractor shall, after receipt of such notice, immediately take corrective action. Such notice, when delivered to the Contractor or his authorized representative at the site of the work, shall be deemed sufficient for the purpose. If the Contractor fails to act promptly, the Engineer may order stoppage of all or part of the work until satisfactory corrective action has been taken. No claim for an extension of time or for excess costs or damage incurred by the Contractor as a result of time lost due to any stop work orders shall be made unless it was later determined that the Contractor was in compliance.

### 1.03 IMPLEMENTATION

- A. Prior to commencement of work, the Contractor shall meet with representatives of the Engineer to develop mutual understandings relative to compliance of the environmental protection program.
- B. SUBMITTALS: The Contractor shall submit for approval two sets of details and literature fully describing environmental protection methods to be employed in carrying out construction activities within 100 feet of wetlands or across areas designated as wetlands. Refer to Special Conditions Contractor's Shop and Working Drawings.

### 1.04 AREA OF CONSTRUCTION ACTIVITY

As far as possible, the Contractor shall confine his construction activities to those areas defined by the plans and specifications. All land resources within the project boundaries and outside the limits of permanent work performed under this contract shall be preserved in their present condition or be restored to a condition after completion of construction at least equal to that which existed prior to work under this contract.

## 1.05 PROTECTION OF WATER RESOURCES

- A. The Contractor shall not pollute streams, lakes or reservoirs with fuels, oils, bitumens, calcium chloride, acids or other harmful materials. It is the Contractor's responsibility to comply with all applicable Federal, State, County and Municipal laws regarding pollution of rivers and streams.
- B. Special measures should be taken to insure against spillage of any pollutants into public waters.

## 1.06 CONSTRUCTION IN AREAS DESIGNATED AS WETLANDS ON THE DRAWINGS

- A. As far as possible, the Contractor shall make every effort to minimize disturbance within areas designated as wetlands.
- B. The Contractor shall perform his work in such a way that these areas are left in the condition existing prior to construction.
- C. Excavated materials shall not be permanently placed or temporarily stored in areas designated as wetlands. Temporary storage areas for excavated material shall be as directed by the Engineer.
- D. The use of a temporary gravel roadway or access whatsoever in the wetlands area is not acceptable.

## 1.07 PROTECTING AND MINIMIZING EXPOSED AREAS

- A. The Contractor shall limit the area of land which is exposed and free from vegetation during construction. In areas where the period of exposure will be greater than two (2) months, temporary vegetation, mulching or other protective measures shall be provided as specified.
- B. The Contractor shall take account of the conditions of the soil where temporary cover crop will be used to insure that materials used for temporary vegetation are adaptive to the sediment control. Materials to be used for temporary vegetation shall be approved by the Engineer.

## 1.08 LOCATION OF STORAGE AREAS

- A. The location of the Contractor's storage areas for equipment and/or materials shall be upon cleared portions of the job site or areas to be cleared as a part of this project, and shall require written approval of the Engineer. Plans showing storage facilities for equipment and materials shall be submitted for approval of the Engineer.
- B. No excavated materials or materials used in backfill operations shall be deposited within a minimum distance of one hundred (100) feet of any watercourse or any drainage facility. Adequate measures for erosion and sediment control such as the placement of

silt fence around the downstream perimeter of stockpiles shall be employed to protect any downstream areas from siltation. There shall be no use of baled hay or straw.

- C. There shall be no storage of equipment or materials in areas designated as wetlands.
- D. The Engineer may designate a particular area or areas where the Contractor may store materials.

## 1.09 PROTECTION OF LANDSCAPE

- A. This work applies to all landscape protection within the project area.
- B. The Contractor shall not deface, injure, or destroy trees or shrubs nor remove or cut them without written authority from the Owner. No ropes, cables, or guys shall be fastened to or attached to any existing nearby trees for anchorages unless specifically authorized by the Engineer. Excavating machinery and cranes shall be of suitable type and be operated with care to prevent injury to trees that are not to be removed, particularly overhanging branches and limbs. The Contractor shall, in any event, be responsible for any damage resulting from such use.
- C. Branches, limbs, and roots shall not be cut except by permission of the Engineer. All cutting shall be smoothly and neatly done without splitting or crushing. When there is unavoidable injury to branches, limbs and trunks of trees, the injured portions shall be neatly trimmed and covered with an application of grafting wax or tree healing paint as directed.
- D. Place tree protection barrier as indicated on the drawings or around trees to remain within the construction limits that are adjacent to proposed improvements. Any trees or landscape feature scarred or damaged by the Contractor's equipment or operations shall be restored as nearly as possible to its original condition at the expense of the Contractor. The Engineer will decide what method of restoration shall be used, and whether damaged trees shall be treated and healed or removed and disposed of under the provisions of Section 02230, CLEARING AND GRUBBING.
- E. Cultivated hedges, shrubs, and plants which could be injured by the Contractor's operations shall be protected by suitable means or shall be dug up, balled and temporarily replanted and maintained. After construction operations have been substantially completed, they shall be replanted in their original positions and cared for until growth is re-established. If cultivated hedges, shrubs, and plants are injured to such a degree as to affect their growth or diminish their beauty or usefulness, they shall be replaced by items of a kind and quality at least equal to that existing at the start of the work.

## 1.10 CLEARING AND GRUBBING

A. The Contractor shall clear and grub only on the Owner's land or the Owner's easements, and only the area required for construction operations, as approved by the Engineer. Removal of mature trees (4 inches or greater DBH) will not be allowed on temporary easements. B. The Contractor shall not remove trees in the Owner's temporary easements without permission of the Engineer.

## 1.11 DISCHARGE OF DEWATERING OPERATIONS

- A. Any water that is pumped and discharged from the trench and/or excavation as part of the Contractor's water handling shall be filtered by an approved method prior to its discharge into a receiving water or drainage system.
- B. Under no circumstances shall the Contractor discharge water to the areas designated as wetlands. When constructing in a wetlands area, the Contractor shall discharge water from dewatering operations directly to the nearest drainage system, stream, or waterway after filtering by an approved method.
- C. The pumped water shall be filtered through baled hay, a vegetative filter strip or a vegetated channel to trap sediment occurring as a result of the construction operations. The vegetated channel shall be constructed such that the discharge flow rate shall not exceed a velocity of more than 1 foot per second. Accumulated sediment shall be cleared from the channel periodically.

## 1.12 DUST CONTROL

- A. During the progress of the work, the Contractor shall conduct his operations and maintain the area of his activities, including sweeping and sprinkling of streets as necessary, to minimize creation and dispersion of dust. If the Engineer decides it is necessary to use calcium chloride for more effective dust control, the Contractor shall furnish and spread the material, as directed. Calcium chloride shall be as specified under Section 01562, DUST CONTROL.
- B. Calcium Chloride shall not be used for dust control within a drainage basin or in the vicinity of any source of potable water.

## 1.13 SEPARATION AND REPLACEMENT OF TOPSOIL

Topsoil shall be carefully removed from improvement areas where earthwork and excavations are to be made, and separately stored to be used again at the discretion of the contractor and or owner or as directed. The topsoil shall be stored in an area acceptable to the Engineer and adequate measures shall be employed to prevent erosion of said material.

## 1.14 SILT FENCE

A. Where indicated on the drawings or where directed by the Engineer, the Contractor shall erect and maintain a temporary silt fence. In areas designated as wetlands, the Contractor shall line the limits of the construction easement with a silt fence. The silt fence shall be used specifically to contain sediment from runoff water and to minimize environmental damage caused by construction.

B. The silt fence shall consist of a 3-foot wide continuous length sediment control fabric, stitched to a 22-foot wide, continuous length support netting, and stapled to preweathered oak posts installed as shown on the drawings. The oak posts shall be 1½-inches by 1½-inches (Minimum Dimension) by 48 inches and shall be tapered. The support netting shall be industrial strength polypropylene. The bottom edge of the sediment control fabric shall be buried as shown on the drawings. The sediment control fabric shall be buried as shown on the drawings. The sediment control fabric shall be buried as shown on the drawings. The sediment control fabric shall be buried as shown on the drawings. The sediment control fabric shall conform to the following properties:

Property	Value	<b>Test Method</b>
1. Grab Strength (lbs.)	124	ASTM D-4632
2. Elongation (%)	15%	ASTM D-4632
3. Puncture Strength (lbs.)	65	ASTM D-4833
4. Burst Strength (psi)	300	ASTM D-3786
5. Trapezoid Tear (lbs.)	60	ASTM D-4533
6. Equivalent Opening Size (U.S. Sieve)	No. 30	ASTM D-4571
7. Permittivity (sec <sup>-1</sup> )	0.10	ASTM D-4491
8. Water Flow Rate (gal/min/sf.)	10	ASTM D-4491
9. UV Resistance (%)	70	ASTM D-4355

## 1.15 INLET PROTECTION IN PAVED AND NON-PAVED AREAS

- A. Where indicated on the drawings or where directed by the Engineer, the Contractor shall erect and maintain a temporary inlet protection.
- B. The Contractor shall install catch basin filter bags in roadways and parking lots with and adjacent to the construction area.
- C. The contractor shall also install filter bags as shown in drawings, catch basins and other proposed structures to trap sediment and to prevent sediment from clogging drainage systems.
- D. The Contractor shall be responsible for cleaning silt in drainage structures within and adjacent to the project area.

#### PROJECT SIGNS

#### PART I – GENERAL

#### 1.01 SCOPE OF WORK

A. Provide all materials, labor, mountings and incidentals for one (1) temporary construction sign, four feet by eight feet (4' x 8'), installed in a location directed by the Owners Representative at each site. one (1) temporary construction sign will be provided in total.

#### PART II – MATERIALS

#### 2.01 SIGN

- A. Sign shall be made of durable, exterior plywood or metal, securely mounted to wood posts or attached to existing fencing, as directed by the Owner's Representative. Sign shall be professionally lettered. Wording and layout to be supplied by the Owner. Submit samples of color and a Shop Drawing indicating lettering layouts to Engineer for approval. Electronic file with sign layout to be provided to Contractor and Owner's representative by the Landscape Architect.
  - 1. Sign shall be a project sign (or banner) and will include color renderings of the final park layout as well as the Town Seal and other pertinent information to be provided by the Owner's Representative.
- B. Sign shall be securely mounted with galvanized metal attachments and shall be framed so as to be durable. All attachments and mountings shall be child safe and vandal resistant. Should a project banner be provided, it may be securely attached to construction fencing.

#### PART III – EXECUTION

#### 3.01 PLACEMENT

- A. Sign shall be installed facing the street or access point to the construction area so as to be visible and inform the general public. Where possible, the sign should be located so as not to conflict with the construction activity nor to require moving during the construction process.
- B. The construction sign shall be maintained in satisfactory condition during construction and then removed and disposed of legally by the Contractor just prior to the final acceptance of the work.

## CONSTRUCTION LAYOUT

## PART I - GENERAL

#### 1.01 SCOPE OF WORK

- A. The work under this section shall consist of field staking the horizontal and vertical alignment of all essential features and proposed work including walkways, pavement areas, retaining walls, monuments, fencing, plantings, utilities and other related features as shown on the plans by a <u>registered Engineer or Land Surveyor Registered in the Commonwealth of Massachusetts</u>. The Contractor shall familiarize himself with the existing conditions and shall be responsible for locating or re-establishing survey field ties, property lines, and benchmarks indicated on the plans.
- B. Existing survey tie information, if available, shall be provided by the Town upon request.
- C. The individual retained to perform the work of this Section shall be as approved by the Town Representative.

#### 1.02 QUALIFICATIONS & SUBMITTALS

- A. The Contractor shall engage the services of a <u>Professional Engineer or Land</u> <u>Surveyor Registered in the Commonwealth of Massachusetts</u> and shall <u>submit</u> the name, address, and registration number of such person or persons to the Engineer in writing.
- B. Whenever reference is made on the plans or in these specifications to a Land Surveyor registered in the Commonwealth of Massachusetts, the Contractor may substitute a Registered Professional Engineer, qualified in the laying out of similar facilities.

#### PART II - MATERIALS

#### 2.01 LAYOUT AND STAKING

- A. The Contractor shall be responsible for furnishing all stakes, pins, and grade markings as required to implement the work of layout and staking and shall make all field adjustments ordered by the Project Representative at no extra cost to the Owner.
- B. Upon request by the Project Representative, the Contractor shall make available to the Owner survey instruments necessary to check the proposed vertical and horizontal alignments at no extra cost.

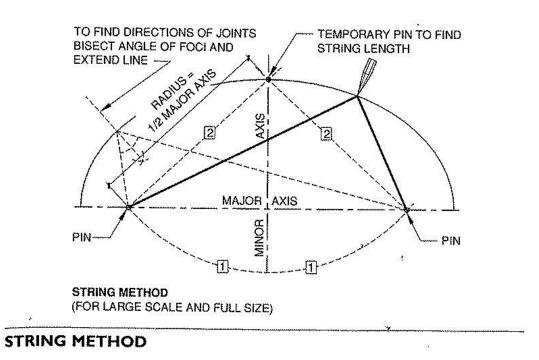
C. Ellipses shall be laid out using #6 rebar "pins" as focal point 1 (F1) and focal point 2 (F2) embedded 2' into the ground for stability. The layout "string" shall be a minimum 3/16" wire rope. Submit product data on wire rope in accordance with section "SUBMITTALS".

## PART III - EXECUTION

## 3.01 SURVEY LAYOUT

- A. The Contractor shall use the alignments shown on the plans to establish the layout of all proposed features and shall perform field adjustments as ordered by the Project Representative.
- B. The Surveyor shall lay out the essential or necessary grades and locations of footings, pavements, utilities, structures and all other proposed site features and elements. The surveyor shall verify the location of any existing spikes, stakes, pipes, drill holes, etc. and shall be responsible for their accuracy. Proposed features shall be located in relation to dimensions shown on the drawings and as adjusted by the Project Representative.
- C. The Contractor shall inform the Project Representative when the general layout is completed and shall not begin excavation until the Project Representative approves the various alignments. Any discrepancies encountered in field conditions shall be reported to the Project Representative immediately and shall be adjusted as directed.
- D. The Contractor shall be responsible for maintaining the correct vertical and horizontal alignment of all elements, which responsibility shall not be waived by the Project Representative's approval of basic layout and stakeout.
- E. The Contractor shall layout any ellipses using the "string method" as indicated on the following page. Alternate layout methods may be acceptable if approved by Landscape Architect. Contractor shall submit shop drawing for proposed alternate layout method for approval in accordance with section "SUBMITTALS".

## **ELLIPSE CONSTRUCTION**



Layout from: "Landscape Architectural Graphic Standards, Leonard J. Hopper, RLA, FASLA. John Wiley & Sons, Inc."

## PROJECT CLOSE-OUT

#### PART 1 - GENERAL:

#### 1.01 GENERAL PROVISIONS

Attention is directed to the General Conditions of the Contract, all Divisions of the Specifications and the Drawings, all of which apply to this section.

#### 1.02 SCOPE OF WORK

- A. The scope of work under this specification section, without limiting the generality thereof, includes the furnishing of all labor, materials, equipment, services, and incidentals necessary to complete all of the work in accordance with the Contract Documents, which are intended to describe and provide for a finished piece of work.
- B. The type of work includes the following, without limiting the generality thereof:
  - 1. Substantial completion
  - 2. Final cleaning.
  - 3. Record drawings.
  - 4. Operating and maintenance data.
  - 5. Warranties.
  - 6. Maintenance materials.
  - 7. Final completion.

#### 1.03 SUBSTANTIAL COMPLETION

- A. Prior to requesting Substantial Completion as provided in the General Conditions the Contractor shall make a thorough inspection of the Work. During this inspection the Contractor shall prepare a comprehensive list of all items remaining to be completed or corrected. This list shall include all remaining Contractor and Subcontractor items to be provided under the Contract Documents.
- B. Upon completion of the list, the Contractor shall notify, the Landscape Architect\Engineer\Engineer in writing, that the Work is Substantially Complete. The Landscape Architect\Engineer\Engineer shall then conduct a thorough inspection. If the Landscape Architect\Engineer\Engineer agrees that the Work is Substantially Complete, the Landscape Architect\Engineer will promptly prepare a monetized punch list, setting forth in accurate detail any items on the Contractor's list and additional items that are not acceptable or incomplete. The Contractor shall coordinate all Subcontractors to achieve prompt completion of the punch list.

- C. The Contractor shall not be relieved of the responsibility to provide Contract items left off of the Landscape Architect\Engineer's\Engineer's punch list.
- D. If the Landscape Architect\Engineer determines that the Work is not Substantially Complete, the Landscape Architect\Engineer shall inform the Contractor of those items that must be completed before the Landscape Architect\Engineer will prepare a monetized punch list. Upon completion of those items, the Contractor shall again request the Landscape Architect\Engineer to prepare a punch list.
- E. When the punch list has been prepared, the Landscape Architect\Engineer will arrange a meeting with the Contractor and Subcontractors to identify and explain all punch list items and answer questions on work which must be done before final acceptance.
- F. The Landscape Architect\Engineer may revise the punch list, from time to time, to ensure that all items of Work are properly completed.

## 1.04 FINAL CLEANING

- A. Immediately prior to Substantial Completion of the work, the Contractor shall perform all cleanup work as follows:
  - 1. Remove all waste materials and rubbish from the site and legally dispose of it.
  - 2. Remove all tools, equipment, machinery, surplus material, temporary enclosures, and any other material belonging to the Contractor or his Subcontractors.
  - 3. Clean all surfaces, fixtures, and equipment within the work areas, and any surfaces outside the work area which have been made dirty by the work of the contract. Leave the entire site clean and ready for use.

## 1.05 RECORD DRAWINGS/AS-BUILT DRAWINGS

- A. During the course of the work the Contractor shall maintain, at the site, a clean set of black line prints of the contract drawings. This set of prints will be marked "Record Drawings" and shall be kept in a clean condition and separate from the drawings in general reference use. On these record drawings, the Contractor shall record all deviations from the work as described in the contract drawings, especially those deviations in utilities work.
- B. At the completion of the work, neat, clean and complete record drawings shall be prepared and submitted to the Owner as a condition precedent to final payment. At his own expense the Contractor shall obtain reproducibles of working drawing sheets from the Owner from which as-built drawings will be prepared.

### 1.06 OPERATING AND MAINTENANCE DATA

At substantial completion of the project, the Contractor shall deliver to the Owner two sets of all operating and maintenance instructions for the various pieces of equipment or paints included in the project. This information shall be neatly bound in loose leaf notebooks for the Owner's permanent record.

#### 1.07 WARRANTIES

At substantial completion of the project, the Contractor shall deliver to the Landscape Architect\Engineer copies of all warranties for the various materials and pieces of equipment included in the project. These warranties shall be submitted in duplicate and shall be bound together with the operating and maintenance data called for above.

#### 1.08 FINAL COMPLETION

- A. Related Requirements: The Contractor's attention is directed to the General Conditions of the Contract.
- B. Final Completion:
  - 1. Within 10 days after Substantial Completion, if any of the items on the Landscape Architect\Engineer's punch list are not complete or if the Contractor has not provided the appropriate Record Drawings, Operating Manuals, Warranties, Guarantees, or Spare Parts, the Landscape Architect\Engineer shall assign a monetary value for each incomplete item as well as any other items as provided by M.G.L. c.30 sec.39K.
  - 2. The Contractor shall provide the Landscape Architect\Engineer with a Notarized Contractor's Certificate and Release and an appropriate Application for Payment. This Application shall be for an amount equal to the remaining balance of the Contract less the amount of the Landscape Architect\Engineer's monetized punch list and any other items as provided under M.G.L. c.30 sec.39K.
  - 3. The Contractor shall complete all remaining Work in accordance with the provisions of the General Conditions.
  - 4. Upon completion of all remaining items, and after receipt of all appropriate Record Drawings, Operating Manuals, Warranties, Guarantees and Spare Parts required by the Contract Documents, The Contractor shall provide a notarized Contractor's Certificate and Release and a final Application for Payment to complement this close-out process.
  - 5. The Contractor shall provide copies of Lien Waivers for all subcontractors and suppliers to obtain final payment. No final payment or release of

01700-3 PROJECT CLOSEOUT retainage shall be made without notarized copies of all Lien Waivers for the completed project.

#### GEOTEXTILE FABRICS

#### PART 1 - GENERAL

#### 1.01 WORK INCLUDED:

This Section covers furnishing of all labor, materials, and equipment necessary to install specified geotextile fabrics in locations shown on the drawings and as required by the Engineer.

## 1.02 SUBMITTALS: IN ACCORDANCE WITH REQUIREMENTS OF GENERAL SPECIFICATIONS, SUBMIT THE FOLLOWING:

Six (6) sets of shop drawings or working drawings and material specifications shall be submitted to the Engineer for review for each type of geotextile fabric furnished. General installation practices and installation schedule shall be included.

#### PART 2 - PRODUCTS

- 2.01 EROSION CONTROL FABRIC:
  - A. Erosion Control Fabric shall be of the best quality proven design and construction and shall be entirely suitable in every respect for the intended service.
  - B. Erosion Control fabric "B" shall be Tencate Miramesh as manufactured by Tencate Geosynthetics, Pendergrass, GA; Enkamat Soil Erosion Matting as manufactured by Bonar, Asheville, N.C.; Tenax Radix Erosion Control Netting as manufactured by Tenax Corp., Baltimore, MD or approved equal.
- 2.02 FILTER/DRAINAGE FABRIC:
  - A. The filter/drainage fabric shall be composed of continuous-filament fibers bonded together to form a sheet. The fabric shall be an average of 20 mils thick and possess the characteristics of Mirafi 140N.
  - B. The filter/drainage fabric shall be Mirafi 140N as manufactured by TenCate Geosynthetics; Foss-65 by Foss Manufacturing Co., Hampton, NH; US 120NW, as manufactured by US Fabrics, Cincinnati, OH, or approved equal.

### PART 3 - EXECUTION

#### 3.01 INSTALLATION:

#### A. GENERAL:

Installation of geotextile fabrics shall be strictly in accordance with manufacturer's instructions and specific layout plans and details reviewed by the Engineer.

#### B. EROSION CONTROL FABRIC:

Erosion control fabric shall be placed over the prepared surface in drainage swales and other locations as required by the Engineer. The fabric shall be unrolled, placed in the direction of water flow, overlapped, pinned down with wood stakes, and seeded. All installation work shall be in accordance with manufacturer's recommendations or as required by the Engineer.

#### C. FILTER/DRAINAGE FABRIC:

The filter/drainage fabric shall be installed in the final graded trench bottom prior to placement of the crushed stone bedding and at other locations shown on the drawings or designated by the Engineer. The drainage fabric in place shall cover the entire trench bottom and trench sides as shown on the drawings. Each width of drainage fabric shall be overlapped in accordance with manufacturer's recommendations, but not less than 2 feet, to prevent intrusion of soil fines into the bedding.

#### 3.02 FINAL INSPECTION AND ACCEPTANCE:

- A. The Contractor shall, at his expense, have a manufacturer's representative inspect the work at completion of the installation. Any work found to be unsatisfactory shall be corrected at the Contractor's expense.
- B. The Engineer, at the Contractor's expense, reserves the right to have a manufacturer's representative inspect the installation process at any time during construction.

#### DEMOLITION

#### PART 1- GENERAL

#### 1.01 SCOPE OF WORK:

- A. Work under this Section shall consist of the careful removal, storage on site, storage for reuse, legal transportation off-site, or demolition, of all structures and site features encountered or noted to be removed or abandoned to four feet below finished grade, and the removal and legal disposal of all materials not called for to be reused or salvaged, in accordance with the contract drawings, these specifications, and the directions of the Engineer. Provide all labor, equipment, materials, transportation and permits necessary to complete the work.
- B. Items plan-referenced to be removed and stored shall be carefully removed and stored on site in a manner and location designated by the Engineer for reinstallation later or pick up by DPW representatives as shown on the plans or as required by the Engineer.
- C. Items plan referenced, or as required by the Engineer to be removed and disposed of shall be removed from the site and properly and legally disposed of by the Contractor.
- D. Items indicated on the contract drawings or in the specifications to be removed and salvaged, or other items required to be removed by the Engineer, shall be transported to a municipal storage facility, located within the Town's confines, and unloaded and stacked as required by the Engineer or Project Manager.
- E. The scope for the general work/demolition requirements of this section include:
  - 1. Removing cement and bituminous concrete pavements.
  - 2. Removal and salvage of flag poles, monuments and other site amenities for reuse, as indicated on the drawings.
  - 3. Clearing and grubbing of existing vegetation.
  - 4. Stripping and stockpiling of existing top soil.
  - 5. Removal of existing fences, bollards, stairs, and curbs.
  - 6. Removal of abandoned utility poles and lights.
  - 7. Removal and disposal of miscellaneous site features within the project areas, as indicated on the drawings.

8. Installation and maintenance of erosion controls.

## 1.02 PROTECTION:

- A. The Contractor shall assume complete responsibility and liability for the safety and structural integrity of all work and utilities to remain during demolition.
- B. Provide safeguards including, but not limited to, warning signs, barricades, temporary fences, warning lights and other items required for protection of personnel and the general public during performance of all work.
- C. All features related to protection shall be maintained until that work has been completed to the point when such safeguards are no longer required.

## 1.03 SPECIAL REQUIREMENTS:

- A. The Contractor shall salvage all, frames, grates, and covers from any demolition work and transport these to the Municipal Storage Yard unless these are called for to be reused, stored on site, or ordered by the Engineer to be disposed of.
- B. Install erosion controls to protect adjacent areas from eroded materials likely to enter wetlands, resource areas, or drainage ways/systems, downstream of areas disturbed by work activities. Refer to Section 01570 ENVIRONMENTAL PROTECTION.
- C. Where items to be demolished are located within or adjacent to pavements to remain, the Contractor shall make provisions to protect that pavement to remain. Cut concrete pavement back to nearest score line and cut bituminous concrete pavement back far enough so as not to allow disturbance to base course materials. Pavements damaged as a result of Contractor activities shall be replaced to the extent determined by the Engineer at no additional cost to the Owner.

## PART 2 - MATERIALS

## 2.01 BACKFILL:

- A. The Contractor shall provide suitable backfill as specified under Section 02300 EARTHWORK of these Specifications, to fill voids left by removal or abandonment of site features, and shall provide all pipe cap ends, mortar, brick and other material needed to cap off or plug pipes of various sizes and kinds.
  - B. Suitable materials shall be used as base course fill and topsoil to the depth as specified herein. Restore disturbed areas with similar materials blended to match the line and grades of adjacent surfaces.

#### 2.02 TEMPORARY FENCE:

A. Refer to Section 02821- TEMPORARY CHAIN LINK FENCE

### PART 3 – EXECUTION

#### 3.01 SALVAGEABLE MATERIAL:

A. Frames, grates and other salvageable material shall be carefully removed to minimize damage and stored for later reuse, transport, or removal from site.

#### 3.02 ABANDONED STRUCTURES:

- A. All inlets and outlets shall be plugged with at least eight (8) inches of brick and mortar masonry. Upper portions of masonry structures shall be removed to a depth of three feet. The bottoms of all structures shall be broken to allow drainage, and the structure shall be filled with suitable backfill material placed in six (6) inch layers and thoroughly compacted at each level.
- B. The Engineer shall review work related to abandoned structures before backfilling. Those items not reviewed before backfilling shall be uncovered and backfill procedures observed, at no expense to the Owner.

#### 3.04 ABANDONED PIPES OR CONDUITS:

- A. Plug previously abandoned drainpipes encountered with masonry brick at least eight (8) inches in thickness.
- B. Abandon discontinued water supplies that are encountered during the execution of this contract in accordance with Town requirements.
- C. Electrical conduits encountered and previously abandoned shall be capped or plugged.

#### CLEARING AND GRUBBING

#### PART 1 - GENERAL

#### 1.01 SCOPE OF WORK:

A. The work under this Section shall consist of clearing, grubbing, cutting, removal and disposal of all vegetation and debris from areas within the Limit of Work where noted on the plans or as designated by the Landscape Architect\Engineer. The work shall also include the preservation from injury or defacement of all vegetation and objects designated or directed to remain.

#### 1.02 SPECIAL INSTRUCTIONS:

- A. The burning of trees, brush, stumps, etc., shall not be permitted. The Contractor shall provide other satisfactory methods of disposal without additional compensation.
- B. When fencing is installed outside normal clearing areas, every reasonable effort shall be made to preserve trees or shrubs whose removal is not essential to the installation of the fencing.
- C. Trees and shrubs that are not to be cut, removed, destroyed or trimmed shall be saved from harm and injury. All damage done to trees by the Contractor's operation shall be appropriately pruned in accordance with accepted horticultural practice unless damage is so extensive that the damage claim process shall be adopted.
- D. Equipment and supply storage areas shall be kept well away from the root zones of existing trees. This zone is determined to be equal to the outreach of the above ground branch structure of the trees. All effort shall be made to minimize any activity in these areas to help insure the continued good health of the existing trees.

#### 1.03 PERMITS:

A. Per Permit Section of these Specifications, the Engineer shall be furnished notarized copies of agreements between the Contractor and owners of legal landfills and disposal or storage areas upon request. The Contractor shall make arrangements and negotiations necessary for the satisfactory legal disposal of trees, shrubs, stumps, roots, dead-wood and other litter off site.

#### PART 2 - MATERIALS

#### 2.01 SUITABLE BACKFILL:

A. Refer to Specification Section 02300 EARTHWORK for suitable backfill

requirements.

#### PART 3- EXECUTION

#### 3.01 CLEARING AND GRUBBING:

- A. Clear and grub all areas as designated on the plans or as required to provide for proposed improvements. At the discretion of the Owner, individual plant materials, not plan referenced, may be denoted in the field to remain as determined by the Project Representative.
- B. The stumps of all trees, brush and major roots shall be grubbed and removed per Section 02236 SELECTIVE INVASIVE SPECIES REMOVAL of these Specifications.
- 3.02 DISPOSAL OF TREES, BRUSH AND STUMPS:
  - A. Trees and stumps shall be properly disposed of off-site at a legal dump site as specified.
- 3.03 DISPOSAL OF DUTCH ELM DISEASED WOOD SHALL BE DONE IN THE MANNER HEREIN SPECIFIED:
  - A. Dutch Elm diseased wood shall be disposed of in accordance with the provisions of General Law, Chapter 87, Section 5 and Chapter 132, Sections 8 and 11, as amended; and in accordance with any additional local regulations.
  - B. Where the work includes the removal of elm trees or the limbs of elm trees, such trees or limbs thereof shall be disposed of immediately after cutting or removal and in such a manner as to prevent the spread of Dutch Elm disease. This shall be accomplished by covering them with earth to a depth of at least six (6) inches at the off-site location where the Contractor has arranged for disposal.
  - C. Where the work includes the removal and disposal of stumps of elm trees, such stumps shall be completely disposed of immediately after cutting in the manner specified above.
- 3.04 BACKFILLING:
  - A. Fill all voids with suitable backfill in controlled eight (8) inch maximum compacted lifts flush with proposed subgrades in adjacent areas.

#### TREE PRUNING AND TREE AND STUMP REMOVALS

#### PART 1 - GENERAL

#### 1.01 WORK INCLUDED:

- A. The work of this Section includes the following:
  - 1. Pruning Class II, including the removal of all limbs necessary to execute the proposed site improvements or recommended by a Massachusetts Certified Arborist including but not limited to aesthetics, structural and or tree health concerns, field, playground and fence work required under this contract.

Standard tree trimming consists of the removal of dead, dying, diseased, decaying, interfering, objectionable, obstructing, and weak branches, as well as selective thinning to lessen wind resistance.

- 2. Removal of trees and stumps completely.
- B. Refer to the Contract Drawings for general location of trees along the site perimeter and within the designated limit of work boundaries. In general, all trees are to removed completely or are to be pruned in conformance with this Specification unless otherwise noted on the contract plans. Tree removals shall be limited to the area denoted on the plans and shall include the removal of individual trees that would impede the construction of proposed facilities.

#### 1.02 QUALIFICATIONS OF CONTRACTOR:

- A. This work shall be limited to individuals, partnerships and corporations who are actively engaged in the field of Arboriculture, and who demonstrate competence, experience and financial capability to carry out the terms of this project. The Owner may require proof of these qualifications.
- B. All work shall be conducted by qualified and trained personnel under the direct supervision of a Massachusetts Certified Arborist (MCA) in the Contractor's employ.
- 1.03 PERSONNEL:
  - A. The Contractor shall submit each employee's name and title prior to the commencement of work. The Contractor shall advise the Owner of any changes

in personnel assigned to this Contract.

- B. The crew foreman shall have a minimum of five (5) years climbing/pruning experience. At least one (1) crew person shall be an MCA and shall be certified in CPR.
- C. Each trimmer shall be experienced and highly qualified with the necessary tree worker skills to successfully complete the work of this Section, including the ability and training to perform aerial rescue. Said skill shall also include worker safety and ability in compliance with current OSHA and ANSI Z-133.1 Standards.

## 1.04 SPECIAL REQUIREMENTS:

A. All Dutch Elm diseased wood shall be disposed of in accordance with provisions of General Laws, Chapter 87, Section 5, and Chapter 132, Sections 8 and 11 as amended; and in accordance with any additional local regulations.

All wood, branches, stumps, and leaf litter shall be removed from the site and be properly disposed of in accordance with state and local regulations.

- B. No burning or burying shall be permitted on the project site.
- C. Prior to commencing work, the Contractor shall submit a plan to the Owner for legal disposal of removed materials, in conformance with State and Federal regulations.

#### 1.05 STANDARDS AND DEFINITIONS:

- A. All pruning work shall be performed in accordance with the following:
  - 1. The ANSI A300 'Standard Practices for Trees, Shrubs, and Other Wood Plant Materials' of the Secretariat: National Arborist Association, Post Office Box 1094, Amherst, New Hampshire 03031.
  - 2. American National Standards Institute (ANSI) Standard Z-133.1.
  - 3. The standards and practices of the International Society of Arborists.
  - 4. The standards and practices of the Massachusetts Arborist Association.
  - 5. The standards and practices of the American Association of Nurserymen.
- B. The term 'Owner' shall mean the Owner's designated representative charged with carrying out the requirements of this Project, Architect, Engineer, Planner, or Tree Warden as referenced herein, rendering approvals for the Owner.

#### 1.06 EXAMINATION OF SITE AND DOCUMENTS:

A. The Contractor shall be responsible for having a clear understanding of the existing site conditions and shall be responsible for fully carrying out the work of this Section, regardless of actual site conditions encountered.

#### 1.07 ORDER OF WORK:

A. Based on the site conference, the Contractor shall submit a schedule of work for the Owner's review and approval prior to beginning work. Unless otherwise authorized by the Owner, failure of the Contractor to comply with the approved removal schedule shall be sufficient cause to give notice that the Contractor is in default of the contract.

#### 1.08 PROTECTION OF THE VEGETATION TO BE PRESERVED:

- A. The Contractor shall protect all existing trees, shrubs, lawns and other site features designated to remain. The placement of protection devices located at the limits of each tree canopies drip line, such as snow fence or approved equal enclosures, may be adjusted at the Owner's discretion and at no cost to the Owner.
- B. Damage no plants, trees and vegetation to remain by burning, pumping water, cutting of live roots or branches, or any other means. Neither vehicles nor equipment shall be parked within the dripline of trees to remain, or where ever damage may result to trees to be saved. Construction material shall not be stored beneath trees to be saved.
- C. The Contractor shall be liable for any damage to any trees, shrub, lawn or other site features to remain, and shall immediately report to the Owner. Damaged shrubs or lawns shall be restored or replaced to match existing to remain to the satisfaction of the Owner.
- D. The Contractor shall compensate the Owner for damages by installing replacement tree(s) of the size and species approved by the Owner and of sufficient quantity such that the sum of the Diameter at Breast Height (DBH) inches for replacement trees equals the total DBH inches of the damaged tree(s). Damaged shrubs shall be replaced with shrubs(s) of the same size, species, and quantity, unless determined otherwise by the Owner.

## 1.09 USE AND CARE OF THE SITE:

- A. The Contractor shall leave the work site at the end of each working period in a condition satisfactory to the Owner.
- B. Pavements shall be swept and lawns or other surfaces raked and/or otherwise cleaned of all material related to the work operation. Degree of clean-up required

will be described by the Owner and will be based upon the character of the work area.

- C. All trimmings or any other form of debris (except diseased materials or trimmings from Elms) shall be collected and chipped. The Contractor shall remove all materials and shall dispose of such materials off site in a legal manner.
- D. The Contractor shall be fully and solely responsible for any damage to equipment or vehicles left at the site of the work. All necessary permits shall be obtained by the Contractor.

## PART 2 - PRODUCTS

#### 2.01 EQUIPMENT:

- A. Equipment necessary for this Contract shall be properly maintained and in good operating condition to the Town's satisfaction. The Contractor shall promptly remove and replace any equipment which the Owner deems to be in unsatisfactory condition or otherwise unsuitable.
- B. Cutting tools shall be kept well sharpened to provide clean smooth cuts. Any tools utilized on any tree suspected to have cankers or other fungal, bacterial or viral diseases shall be sterilized or not used on any other specimen.
- C. A disc chipper shall be used which will process material up to twelve (12) inches in diameter.

## PART 3 - EXECUTION

#### 3.01 PRUNING:

- A. Under this Section, the Contractor shall furnish all labor, materials, equipment and transportation required to complete all aspects of the work in accordance with all local, state and federal regulations in force at the same time of this Contract and in accordance with tree pruning as specified herein.
- B. The work of this Section consists of all pruning work and related items as specified herein and includes, but is not limited to:
  - 1. Pruning Class II throughout the designated areas and limb removal required to allow for the proper installation of all new site improvements including but not limited to fields, play equipment and fencing.

Class II pruning is defined as medium pruning and shall consist of the removal of dead, dying, diseased, interfering, objectionable and weak branches on the main trunks as well as those within the leaf area. An occasional branch one (1) inch or less in diameter may remain within the main leaf area where it is not practical to remove it.

#### 3.02 DESCRIPTION OF PRUNING WORK:

- A. Pruning and trimming are generally described as the removal and disposal of limbs, branches and stubs which are either dead, potentially detrimental to the health of the tree or dangerous to pedestrians, visually deficient, interfering or otherwise objectionable as determined by the Owner.
- B. The limits of all trees to be pruned have been identified on the plans or referenced elsewhere in this specification section.
- C. Vehicle access shall be controlled and approved by the Owner.
- D. If the Contractor discovers tree(s) which have not been marked for pruning, but whose condition is such that removal is warranted, whether due to death, disease, decay, or structural weakness, such tree(s) shall not be pruned and the Contractor shall immediately report these findings in writing to the Owner and await the Owner's direction before proceeding with work on the particular tree(s) in question.
- E. All pruning shall be performed in a manner that maintains the natural aesthetic characteristics of the species and variety of trees. No topping or dehorning of trees or stubbing back of branches shall be permitted. All cuts shall be made to a lateral branch that is a minimum of one third (1/3) the size of the branch being removed, unless otherwise instructed by the Owner.
- F. The use of climbing spurs or spiked shoes shall not be permitted and their use will result in the immediate cancellation of the contract.
- G. All cuts shall be made sufficiently close to the parent stem so that wound closure can be readily started under normal conditions. Cuts shall, however, never be made through the branch collar. Slab cuts and rip cuts will result in cancellation of the contract.
- H. All limbs over two (2) inches in diameter to be removed shall be precut to prevent splitting. Any branches that by falling would injure existing trees to remain or other objects shall be lowered to the ground by proper ropes.
- I. On trees known to be diseased and where there is known to be danger of transmitting the disease on tools, tools shall be disinfected with alcohol or bleach after each cut between trees.
- J. Lateral branches as well as occasional branch suckers ("water sprouts") may be retained. Complete removal of secondary laterals and branch suckers resulting in the stripping of major limbs, ("lion tailing") will not be permitted.

- K. Tree paint to seal pruning cuts shall not be used.
- L. All branches and limbs shall be manually lowered to the ground via rope and pulley. This practice must be consistent with the National Arborist Association Standards for Pruning. All grade-level artifacts and landscaping must be protected from damage.

#### 3.03 REMOVALS:

A. The Contractor shall furnish all labor, materials, equipment and transportation required to complete all aspects of the removals work in accordance with all local, state, and federal regulations in force at the time of this contract and in accordance with tree and stump removals as specified herein.

#### 3.04 DESCRIPTION OF REMOVAL WORK:

- A. Removal is generally described as the removal of groups and individual trees and shrubs which interfere with the growth of more desirable types of trees; the clearing away of lesser growth that may obscure outstanding trees; and thinning out to provide space for healthy growth by the elimination of thinner, weaker trees.
- B. The Contractor shall adhere to the specifications and provide suitable facilities for inspecting the work. Failure of the Owner to immediately reject unsatisfactory work or to notify the Contractor of deviations from the specification shall not relieve the Contractor of responsibility to correct or remedy unsatisfactory work.
- C. The Contractor shall only work on trees designated by the Owner. No compensation will be made for work performed on any other tree or trees.
- D. Trees designated to be removed shall be taken down and all leaves, branches and trunks of trees properly disposed of by chipping and removal from the premises.
- E. Fell trees in a manner that allows all site features and those trees to be saved undamaged.
- F. Removal of all the parts of each tree shall be completed on the same day that the tree is cut.
- G. Where approved prior to commencing the work by the Owner, stumps shall be ground to eighteen (18) inches below grade by grinding or other means acceptable to the Owner. The void from the stump removal operations shall be filled with ordinary borrow soil to within six (6) inches of finished grade. The top six (6) inches shall be filled with screened loam, moderately tamped to prevent future settling. In areas where indicated on the plans as proposed seed areas the disturbed area shall be sown with grass seed of a mix per specifications, as directed by the

Owner.

- H. Excavation or grading within the branch spread of trees to be saved shall be performed only under the direction of the Owner unless otherwise directed. Removal of pavement such as bituminous concrete in these zones shall be by hand tools and/or air spade to ensure root health for trees to remain.
- I. All equipment to be used and all work to be performed must be in full compliance with all standards as promulgated by OSHA at the time of bidding, including but not limited to those regulations concerning noise levels, protective devices and operator safety.
- J. The Contractor shall be solely responsible for pedestrian and vehicular safety and control within the work site and shall protect the public and its property from injury or damage that could be caused by the progress of the work. To this end the Contractor shall provide, erect, and maintain protective devices acceptable to the Owner, including but not limited to barricades, lights and warning signs.
- K. Any practice employed by the Contractor that is obviously hazardous as determined by the Owner shall be immediately discontinued by the Contractor upon receipt of either written or oral notice from the Owner to discontinue such practice.

#### SELECTIVE INVASIVE SPECIES REMOVAL

#### PART 1 - GENERAL

#### 1.01 SCOPE OF WORK

- A. The work of this Section includes the following:
  - 1. Pruning Class II, to include all existing trees and shrubs located within the designated limits of work of each parks. Work shall also include the removal of limbs as necessary to provide appropriate clearances and installation of new site improvements including but not limited to fields, courts, playgrounds and other various site features.
  - 2. Removal of selected living trees and removal of all dead, dying or diseased vegetation from within the project limits in accordance with the contract documents specifications. Trees requiring removal in the areas indicated as "selective clearing" will be tagged by the Owner during Construction.
  - 3. Removal of invasive species and undesirable undergrowth in accordance with these specifications.
  - 4. Complete removal and disposal of trees and stumps as designated herein and as described on the contract drawings.
- B. Refer to the Contract Drawings for the general quantity and locations of existing trees that require pruning or removal. Trees shall be pruned in conformance with this specification. Tree removals shall be limited to areas as denoted on the plans and shall include the removal of individual trees that would impede the construction of proposed facilities or those that are dead or dying.
- C. Prospective bidders are advised to complete a site visit to review the extent of work required and to confirm existing conditions, access issues, terrain and the general nature of the work of the Section.

### 1.02 QUALIFICATIONS OF CONTRACTOR

A. This work shall be limited to individuals, partnerships and corporations who are actively engaged in the field of Arboriculture, and who demonstrate competence, experience and financial capability to carry out the terms of this project. Eligible contractors must derive a majority of their income from arboricultural work. The Owner may require proof of these qualifications.

B. All work shall be conducted by qualified and trained personnel under the direct supervision of a Massachusetts Certified Arborist (MCA) in the Contractor's employ.

## 1.03 SPECIAL REQUIREMENTS

- A. Trees: The trees to be removed shall be those shown on the plans or designated by the Engineer/Arborist.
- B. Undergrowth: All plants less than 4 inches in diameter, measured at a height of 4 feet 6 inches above the ground, shall be classified as undergrowth. All undergrowth shall be removed from areas shown on the plans, described in the special provisions, or designated by the Engineer; except for those plants designated by the Engineer to be preserved.
- C. General: When specified in the special provisions, stumps shall be treated with a herbicide immediately after cutting to prevent sprouting. The herbicide to be used, and the method and rate of application shall be as specified in the special provisions. The Contractor shall follow all applicable instructions, warnings, and safety precautions stated on the manufacturer's label, and shall comply with all laws and regulations governing herbicides that are in effect at the time of use. When work is performed properly in accordance with these specifications, no subsequent recutting of sprouts or seeding growth will be required. All trees and undergrowth cut shall be disposed of in accordance with the applicable requirements of Section 02220 Demolition of these specifications.
- D. Dutch Elm diseased wood shall be disposed of in accordance with provisions of General Laws, Chapter 87, Section 5, and Chapter 132, Sections 8 and 11 as amended; and in accordance with any additional local regulations. All wood shall be removed from the site and be properly disposed of in accordance with state and local regulations.
- E. No burning shall be permitted on the project site.
- F. Prior to commencing work, the Contractor shall submit a plan to the Owner for legal disposal of removed materials, in conformance with State and Federal regulations.

#### 1.04 STANDARDS AND DEFINITIONS

- A. All pruning work shall conform to the following:
  - 1. The ANSI A300 'Standards Practices for Trees, Shrubs, and Other Wood Plant Materials' of the Secretariat: National Arborist Association, Post Office Box 1094, Amherst, New Hampshire 03031.

- 2. American National Standards Institute (ANSI) Standard Z-133.1.
- B. The term 'Owner' shall mean the Town of Natick designated representative charged with carrying out the requirements of this Project 'Landscape Architect', 'Arborist', 'Engineer', 'Planner', or 'Tree Warden' as referenced herein, rendering approvals for the Owner.
- C. The owner's representative or engineer will monitor job progress throughout the project and approve all payments. A site walk will be conducted before work begins between the contractor and the owner's representative or landscape architect. Specific trees, undergrowth and invasive species may be identified at this time for removal/eradication.

## 1.05 EXAMINATION OF SITE AND DOCUMENTS

A. The Contractor shall be responsible for having a clear understanding of the existing site conditions and shall be responsible for fully carrying out the work of this Section, regardless of actual site conditions encountered.

#### 1.06 ORDER OF WORK

A. Based on the site conference, the Contractor shall submit a schedule of work for the Owner's review and approval prior to beginning work. Unless otherwise authorized by the Owner, failure of the Contractor to comply with the approved removal schedule shall be sufficient cause to give notice that the Contractor is in default of the contract.

## 1.07 PROTECTION OF THE VEGETATION TO BE PRESERVED

- A. The Contractor shall protect all existing trees, shrubs, lawns and other site features designated to remain. The placement of protection devices, such as snow fence enclosures, shall, however, be at the Contractor's discretion.
- B. Damage no plant to remain by burning, pumping water, cutting of live roots or branches, or any other means. Neither vehicles nor equipment shall be parked within the dripline of trees to remain, or where ever damage may result to trees to be saved. Construction material shall not be stored beneath trees to be saved.
- C. The Contractor shall be liable for any damage to any trees, shrub, lawn or other site features to remain, and shall immediately report to the Owner. Damaged shrubs or lawns shall be restored or replaced to match existing to remain to the satisfaction of the Owner.
- D. The Contractor shall compensate the Owner for damages by installing

replacement tree(s) of the size and species approved by the Town and of sufficient quantity such that the sum of the caliper inches for replacement trees equals the total caliper inches of the damaged tree(s). Damaged shrubs shall be replaced with shrubs(s) of the same size, species, and quantity, unless determined otherwise by the Owner.

- E. Any plants that are damaged to such an extent as to destroy their value for landscape purposes shall be cut and disposed of, and grass that is damaged shall be reseeded and remulched as necessary by the Contractor at no cost to the Owner when so directed by the Engineer.
- F. The Contractor shall conduct his operations in such a manner to prevent injury to trees, shrubs, grass, or other types of vegetation that are to remain growing, and also to prevent damage to adjacent property.
- G. When any such injuries to trees or shrubs occur, broken branches shall be removed and rough edges of scarred areas shaped and made smooth in accordance with generally accepted horticultural practice.

#### 1.08 USE AND CARE OF THE SITE

- A. The Contractor shall leave the work site at the end of each working period in a condition satisfactory to the Owner.
- B. Pavements shall be swept and lawns or other surfaces raked and/or otherwise cleaned of all material related to the work operation. Degree of clean-up required will be described by the Owner and will be based upon the character of the work area.
- C. All trimmings or any other form of debris (except diseased materials or trimmings from Elms) shall be collected and chipped. The Contractor shall remove all materials and shall dispose of such materials off site in a legal manner.
- D. The Contractor shall be fully and solely responsible for any damage to equipment or vehicles left at the site of the work. All necessary permits shall be obtained by the Contractor.

## PART 2 - MATERIALS

- 2.01 EQUIPMENT
  - A. Equipment necessary for this Contract shall be properly maintained and in good operating condition to the Town's satisfaction. The Contractor shall promptly remove and replace any equipment which the Owner deems to be in unsatisfactory condition or otherwise unsuitable.

- B. Cutting tools shall be kept well sharpened to provide clean smooth cuts. Any tools utilized on any tree suspected to have cankers or other fungal, bacterial, or viral disease shall be sterilized or not used on any other specimen.
- C. A disc chipper shall be used which will process material up to twelve (12) inches in diameter.

### 2.02 PERSONNEL

- A. The Contractor shall submit each employee's name and title prior to the commencement of work. The Contractor shall advise the Owner of any changes in roster assigned to this contract.
- B. A crew shall consist of one (1) tree trimmer/climber, and one (1) ground person (one of whom shall be a crew foreman). The crew foreman shall have a minimum of five (5) years climbing/pruning experience. At least one (1) crew person shall be a MCA or ISA certified arborist and shall be certified in CPR.
- C. Each trimmer shall be experienced and highly qualified with the necessary tree worker skills to successfully complete the work of this Section, including the ability and training to perform aerial rescue. Said skill shall also include worker safety and ability in compliance with current OSHA and ANSI Z-133.1 Standards.

## PART 3 - EXECUTION OF SELECTIVE CLEARING AND INVASIVE SPECIES REMOVAL

#### 3.01 SELECTIVE CLEARING AND INVASIVE SPECIES REMOVAL

A. The Contractor shall furnish all labor, materials, equipment and transportation required to complete all aspects of the selective clearing and invasive species work in accordance with all local, state, and federal regulations in force at the time of this contract and in accordance with selective clearing and invasive species removal as specified herein.

# 3.02 DESCRIPTION OF WORK-SELECTIVE CLEARING AND INVASIVE SPECIES REMOVAL

- A. The work under this item shall consist of the removal of hazardous growth and dead, dying or diseased plant material; the removal of groups and individual plants which interfere with the growth of more desirable types of trees and the clearing away of lesser growth that may obscure outstanding trees, tree groups, or scenic views. Any part of tree trunks or base of plant material located on the Property Lines shall be considered within the property.
- B. Contractor shall educate themselves and completely understand the different control methods before commencing with the work. Many plants may be able to

be removed by hand, mowed or cut. Herbicides can also effectively remove invasive plants, but should be used in accordance with the manufactures instructions and with discretion. Contractor shall submit all herbicides to Owner for approval prior to commencing work. Never apply herbicides prior to a rain event or near wetlands, rivers, streams or conservation areas.

- C. Densely wooded areas shall be thinned to provide space for healthy growth by eliminating thinner, weaker trees and the reduction of number of varieties.
- D. The Contractor's attention is called to the requirements for work under this item. The desired appearance to be attained in certain areas of heavy growth may require three or more operations. First, the obvious dead, dying and diseased trees and undergrowth shall be cut and cleared out of the area. This work includes removal of any previously fallen trees, branches, uprooted stumps and other debris as directed. Next, the area is to be thinned out, as directed, by removing the less desirable trees and brush which interfere with the growth of the better plant material. Finally, clear out lesser growth which may obscure outstanding trees, tree groups or scenic views.
- E. Contractor shall keep records of all products used and provide them to the Town prior to final completion.

#### DEWATERING

#### PART 1 - GENERAL

#### 1.01 WORK INCLUDED:

This section specifies designing, furnishing, installing, maintaining, operating and removing temporary dewatering systems as required to lower and control water levels and hydrostatic pressures during construction; disposing of pumped water; constructing, maintaining, observing and, except where indicated or required to remain in place, removing of equipment and instrumentation for control of the system.

#### 1.02 RELATED WORK:

- A. Section 00890, PERMITS
- B. Section 01570, ENVIRONMENTAL PROTECTION
- C. Section 02252, SUPPORT OF EXCAVATION
- D. Section 02300, EARTHWORK
- 1.03 SYSTEM DESCRIPTION:
  - A. Dewatering includes lowering the water table and intercepting seepage which would otherwise emerge from the slopes or bottom of the excavation; increasing the stability of excavated slopes; preventing loss of material from beneath the slopes or bottom of the excavation; reducing lateral loads on sheeting and bracing; improving the excavation and hauling characteristics of sandy soil; preventing rupture or heaving of the bottom of any excavation; and disposing of pumped water.
- 1.04 QUALITY ASSURANCE:
  - A. The Contractor is responsible for the adequacy of the dewatering systems.
  - B. The dewatering systems shall be capable of effectively reducing the hydrostatic pressure and lowering the groundwater levels to a minimum of 2 feet below excavation bottom, unless otherwise required by the Engineer, so that all excavation bottoms are firm and dry.
  - C. The dewatering system shall be capable of maintaining a dry and stable subgrade until the structures, pipes and appurtenances to be built therein have been completed to the extent that they will not be floated or otherwise damaged.

D. The dewatering system and excavation support (see Section 02252, SUPPORT OF EXCAVATION) shall be designed so that lowering of the groundwater level outside the excavation does not adversely affect adjacent structures, utilities or wells.

#### 1.05 SUBMITTALS

A. Contractor shall submit six copies of a plan indicating how they intend to control the discharge from any dewatering operations on the project, whether it is discharge of groundwater from excavations or stormwater runoff during the life of the project.

## PART 2 - PRODUCTS: NOT APPLICABLE

## PART 3 - EXECUTION

- 3.01 DEWATERING OPERATIONS:
  - A. All water pumped or drained from the work shall be disposed of in a manner that will not result in undue interference with other work or damage to adjacent properties, pavements and other surfaces, buildings, structures and utilities. Suitable temporary pipes, flumes or channels shall be provided for water that may flow along or across the site of the work. All disposal of pumped water shall conform to the provisions of Section 01570 ENVIRONMENTAL PROTECTION and Section 00890 PERMITS.
  - B. Dewatering facilities shall be located where they will not interfere with utilities and construction work to be done by others.
  - C. Dewatering procedures to be used shall be as described below:
    - 1. Crushed stone shall encapsulate the suction end of the pump to aid in minimizing the amount of silt discharged.
    - 2. For dewatering operations with relatively minor flows, pump discharges shall be directed into hay bale sedimentation traps lined with filter fabric. Water is to be filtered through the hay bales and filter fabric prior to being allowed to seep out into its natural watercourse.
    - 3. For dewatering operations with larger flows, pump discharges shall be into a steel dewatering basin. Steel baffle plates shall be used to slow water velocities to increase the contact time and allow adequate settlement of sediment prior to discharge into waterways.
    - 4. Where indicated on the contract drawings or in conditions of excess silt suspended in the discharge water, silt control bags shall be utilized in catch basins.

D. The Contractor shall be responsible for repair of any damage caused by his dewatering operations, at no cost to the Owner.

#### SUPPORT OF EXCAVATION

#### PART 1 - GENERAL

#### 1.01 WORK INCLUDED:

- A. This section of the specification covers wood sheeting and bracing for support of excavations. The requirements of this section shall also apply, as appropriate, to other methods of excavation support and underpinning which the Contractor elects to use to complete the work.
- B. The Contractor shall furnish and place timber sheeting of the kinds and dimensions required, complying with these specifications, where indicated on the drawings or required by the Engineer.

#### 1.02 RELATED WORK:

- A. Section 02300, EARTHWORK.
- B. Section 02240, DEWATERING.
- 1.03 QUALITY ASSURANCE:
  - A. This project is subject to the Safety and Health regulations of the U.S. Department of Labor set forth in 29 CFR, Part 1926, and to the Massachusetts Department of Labor and Industries, Division of Industrial Safety "Rules and Regulations for the Prevention of Accidents in Construction Operations (454 CMR 10.0 et seq.) Contractors shall be familiar with the requirements of these regulations.
  - B. The excavation support system shall be of sufficient strength and be provided with adequate bracing to support all loads to which it will be subjected. The excavation support system shall be designed to prevent any movement of earth that would diminish the width of the excavation or damage or endanger adjacent structures.

## PART 2 - PRODUCTS

#### 2.01 MATERIALS:

A. Timber sheeting shall be sound spruce, pine, or hemlock, planed on one side and either tongue and grooved or splined. Timber sheeting shall not be less than nominal 2 inches thick.

B. Timber and steel used for bracing shall be of such size and strength as required in the excavation support design. Timber or steel used for bracing shall be new or undamaged used material which does not contain splices, cutouts, patches, or other alterations which would impair its integrity or strength.

# PART 3 - EXECUTION

### 3.01 INSTALLATION:

- A. Work shall not be started until all materials and equipment necessary for their construction are either on the site of the work or satisfactorily available for immediate use as required.
- B. The sheeting shall be securely and satisfactorily braced to withstand all pressures to which it may be subjected and be sufficiently tight to minimize lowering of the groundwater level outside the excavation, as required in Section 02240, DEWATERING.
- C. The sheeting shall be driven by approved means to the design elevation. No sheeting may be left so as to create a possible hazard to safety of the public or a hindrance to traffic of any kind.
- D. If boulders or very dense soils are encountered, making it impractical to drive a section to the desired depth, the section shall, as directed, be cut off.
- E. The sheeting shall be left in place where indicated on the drawings or ordered by the Engineer in writing. At all other locations, the sheeting may be left in place or salvaged at the option of the Contractor. Steel or wood sheeting permanently left in place shall be cut off at a depth of not less than two feet below finish grade unless otherwise directed.
- F. All cut-off will become the property of the Contractor and shall be removed by him from the site.
- G. Responsibility for the satisfactory construction and maintenance of the excavation support system, complete in place, shall rest with the Contractor. Any work done, including incidental construction, which is not acceptable for the intended purpose shall be either repaired or removed and reconstructed by the Contractor at his expense.
- H. The Contractor shall be solely responsible for repairing all damage associated with installation, performance, and removal of the excavation support system.

# END OF SECTION

#### SECTION 02290

#### SEEDING

#### PART 1 - GENERAL

#### 1.01 WORK INCLUDED:

- A. This Section includes furnishing all labor, materials, equipment, seed and incidental materials necessary to accomplish all grass seeding and related work, complete in place, maintained, and accepted, in accordance with the Contact Drawings and Specifications. All grassed areas disturbed by the Contractor's operations shall be repaired as herein specified.
- B. The Contractor shall bear the responsibility and cost of furnishing and applying water or any other substances, as necessary to ensure the sustainability of grass seeded areas, as part of the work of this contract.

#### 1.02 RELATED WORK:

- A. Section 02329, TOPSOIL LOAM BORROW.
- B. Section 02911, ROOT ZONE MIX FOR BALLFIELDS

#### 1.03 SUBMITTALS:

In accordance with requirements of general specifications, the Contractor shall submit the following to the Engineer for review and approval:

- A. Six copies of information for seed mixes including the following:
  - 1. Name and address of the seed supplier.
  - 2. Source of origin and dates of harvest for each of the various types of seed
  - 3. Certification of seed mix composition and proportion, indicating named seed varieties by percent, percent germination, purity, and percent crop seed, percent inert matter, and percent weed seed content.
  - 4. Estimated number of seeds per pound of each type of seed in the mix
  - 5. Ingredients that comprise the hydroseed mix
  - 6. Soil amendments and fertilizers and indicated in Appendix A Sand and Soil Amendments

- B. Six copies of information detailing proposed limestone, fertilizers, mulch materials, hydroseeding materials (as required), and slope protection material (as required) to be applied to seeded areas.
- C. Six copies of watering, fertilizing and maintenance schedule.
- D. Six copies of marked up prints indicating the square footage of all proposed seeded areas with quantities of various soil additives and amendments, and quantities of seed for each area prior to beginning work.
- PART 2 PRODUCTS
- 2.01 MATERIALS:
  - A. LOAM BORROW;
    - 1. Loam Borrow shall be as specified in Section 02910, SCREENED LOAM BORROW AND TOPSOIL RE-USED.
  - B. LIMESTONE:
    - 1. Lime shall be an approved agricultural limestone containing at least 50 percent total oxides (calcium oxide and magnesium oxide). The material will be ground such that 50 percent of the material will pass through a No. 100 mesh sieve and 98 percent will pass a No. 2 mesh sieve. Lime shall be uniform in composition, dry and free-flowing and shall be delivered to the site in the original sealed containers, each bearing the manufacturer's guaranteed analysis.
  - C. FERTILIZER:
    - 1. Fertilizer shall be a complete, standard commercial fertilizer, homogenous and uniform in composition, dry and free-flowing, and shall be delivered to the site in the manufacturer's original sealed containers, each bearing the manufacturer's guaranteed analysis and marketed in compliance with State and Federal Laws. All fertilizer shall be used in accordance with the manufacturer's recommendations. Refer to Appendix A Sand and Soil Amendments for required fertilizers. All fertilizers and soil amendments shall meet these requirements or be an approved equal.
    - 2. Refer to Appendix A Sand and Soil Amendments for required fertilization requirements.
  - D. SEED:
    - 1. Seed shall be of an approved perennial variety mixture, the previous year's crop, clean, and high in germinating value. Weed seed content shall be less than 0.5 percent and include no noxious weeds. Seed shall be obtained from a reliable seed company and shall be accompanied by certificates of compliance relative to mixture

purity and germinating value. Seed shall be furnished and delivered in new, clean, sealed and properly labeled containers. All seed shall comply with applicable State and Federal laws. Seed that has become wet, moldy or otherwise damaged shall not be accepted.

2. Grass seed for playing field areas shall conform to the following requirements: TOUCHDOWN 80/20 MIX or approved equal.

Botanical and Common Names	Proportion by Weight	Germination Rate	Purity Minimum
Touchdown Kentucky Bluegrass	30%	70%	97%
Mercury Kentucky Bluegrass	30%	90%	98%
Armada Bluegrass	20%	80%	85%
Futura 3000 Ryegrass Blend	20%	90%	98%

Refer to Appendix A – for technical information on the seed types

3. Seed for landscape lawn areas (not athletic fields) shall conform to the following requirements: Green Space Mix or equivalent. Install at a rate of 6lb/1000 s.f.

30% Falcon IV Tall Fescue20% Dallas Tall Fescue20% Metolius Perennial Rye20% Diva Kentucky Blue10% Double Time Perennial Rye

#### E. TEMPORARY COVER CROP:

#### 1. Temporary cover crop shall conform to the following requirements:

Botanical and Common Names	Proportion by Weight	Germination Rate	Purity Minimum
Annual Ryegrass (Lolium multiflorum)	80% min.	85%	%
Creeping Red Fescue (Festuca rubra)	4% min.	85%	95%
Perennial Ryegrass (Lolium perenne)	3% min.	90%	98%

(Trifolium pratense)	3% min.	90%	%
Other Crop Grass Noxious Weed Seed Inert Matter	0.5% max. 0.5% max. 1.0% max.		

# G. MULCH

- 1. Materials to be used in mulching seeded areas shall be free of weed seed and shall conform to the following requirements:
  - a. Hay Mulch shall consist of mowed and properly cured grass, clover or other acceptable plants. No salt hay shall be used.
  - b. Straw Mulch shall consist of stalks or stems of grain after threshing.

# H. HYDROSEED MULCH, TACKIFIERS AND WATER RETENTION AGENTS:

- 1. Wood fiber mulch for Hydroseed application shall be a manufactured product of natural wood cellulose fibers with a non-toxic green marking dye incorporated to ensure uniform distribution. Mulch shall be packed in sealed original containers, clearly labeled with brand name and manufacturer. It shall have delivered moisture content less than 12 percent.
- 2. Hydroseed tackifier shall be a powdered starch-based product approved by the Engineer. Hydroseed tackifier shall be applied in conjunction with the hydroseed slurry in accordance with the manufacturer's recommendations.
- 2. Moisture retention agent shall be a powdered starch-based product, approved by the Engineer, and shall be capable of retaining up to 400 times their weight in water. Moisture retaining agents shall be added to the hydroseed slurry in accordance with the manufacturer's recommendations. Moisture retention agent shall be 'Hydro-Gel', as manufactured by Finn Corporation, Fairfield, OH.
- 3. Contractor to submit mix ingredients prior to installation of hydroseed.

# I. SLOPE EROSION PROTECTION:

1. Erosion control blanket shall be 100 percent biodegradable mesh with 100 percent biodegradable straw or straw/coconut fill. Fill shall be held together by biodegradable fastening. Weight shall be 0.50 pounds per square yard. Erosion control blankets shall be applied parallel to direction of water flow. The erosion control blankets shall be by North American Green, Evansville, IN or approved

equal. For slopes 4:1 or greater, erosion control blanket shall be composed of 70 percent straw 30 percent coconut fiber, Model SC150. For slopes less than 4:1, erosion control blanket shall be high velocity straw matting, Model S150.

3. Six-inch wire staples shall be placed in accordance with the manufacturer's recommendations to anchor the mesh material. Staples shall be biodegradable.

# J. WATER:

1. Water shall be furnished by the Contractor, unless otherwise specified, and shall be suitable for irrigation and free from ingredients harmful to plant growth and viability. The delivery and distribution equipment required for the application of water shall be the furnished by the Contractor, at no additional cost to the Owner.

# PART 3 - EXECUTION

# 3.01 GENERAL:

- A. All work shall be performed by skilled workers with a minimum of 2 years of sports field seeded lawn construction and establishment experience and under the full-time supervision of a qualified foreman.
- B. Seeding operations shall not begin less than 4 days after the application of lime and fertilizer and the seedbed areas are reviewed and approved by the Engineer.
- C. Seeding shall be done when soil and weather conditions permit in early spring, until June 15, or from September 10 to October 15, unless otherwise approved. If it becomes necessary for seed to be sown after June 15, provisions shall be made for supplementary water and using mulch cover over lawn areas.
- D. If there is a delay in seeding, during which weeds grow, or soil is washed out, the Contractor shall eliminate the weeds by physical means, or replace the soil before sowing the seed, without additional compensation. Immediately before seeding is begun, the soil shall be lightly raked.
- E. Seed shall be sown at the approved rate, on a non-windy day by machine, or as approved by the Engineer.
- F. The surface shall be kept moist by a fine spray until the seed shows uniform germination over the entire area. Wherever poor germination occurs in areas larger than 3 square feet, the Contractor shall reseed, roll, straw and water as necessary to obtain proper germination.
- G. If there is insufficient time in the planting season to complete soil preparations, fertilizing, and seeding, permanent seeding may be left until the following planting season, at the option of the Contractor, or on order of the Engineer. In that event, a temporary cover crop

shall be sown. This cover crop shall be cut and watered as necessary until the beginning of the following planting season, at which time it shall be plowed or harrowed into the soil, the area shall be fertilized and the permanent seed crop shall be sown as specified.

H. Protection of all newly loamed and graded areas is required and shall be accomplished by whatever means necessary such as mulch applied with a tackifier, or by other means approved by the Engineer. The Contractor shall be responsible for the prevention of siltation in areas beyond the limit of work and for all means of protection throughout the maintenance period at no additional cost to the Owner.

# 3.02 ROOT ZONE MIX TESTING REQUIREMENTS

- A. Root zone mix (vegetative support layer) samples shall be collected from in-place mix at a minimum of every 1000 cubic yards and analyzed for grain size (ASTM D422), pH (ASTM D6276) and organic content (ignition test).
- 3.02 SURFACE PREPARATION:
  - A. Refer to SECTION 02911 ROOT ZONE MIX FOR BALL FIELDS and Appendix A Sand and Soil Amendments for surface preparation.

# 3.03 BROADCAST SEEDING, PLACING MULCH AND SLOPE EROSION PROTECTION:

- A. Athletic field seeding shall be sown by slice seeding and broadcast spreader. 5lb/1,000 s.f. shall be sown by slice seeding, the remaining 1lb/1,000 s.f by broadcast spreader., or as directed by the Engineer. Seed shall be divided into 2 equal amounts and uniformly distributed in 2 applications at right angles to each other. Seed shall then be raked lightly into the soil to a depth of 1/4 inch.
- B. If mulch is not necessary the seed shall be directly firmed into the soil with a roller that will apply pressure between 75 and 100 pounds per linear foot of width.
- C. Hay or Straw Mulch shall be used based on time of seeding as previously specified over all seeded areas, as designated on the plans, or as otherwise directed. If mulch is to be used, it shall be loosely spread to a uniform depth at a rate of 4-1/2 tons per acre to provide ¼ inch of cover, or as otherwise directed. The seed and mulch shall then be firmed into the soil with a roller that will apply a pressure between 75 and 100 pounds per foot of width.
- D. Hay or Straw Mulch may be applied by mechanical apparatus, if in the judgment of the Engineer, the apparatus spreads the mulch uniformly and forms a suitable mat to control slope erosion. The apparatus shall be capable of spreading at least 80 percent of the hay or straw in lengths of 6-inches or more, otherwise it shall be spread by hand without additional compensation.

E. Slope erosion control blankets shall be placed as indicated on the plans or as directed by the Engineer.

# 3.04 HYDROSEEDING:

- A. The application of lime, fertilizer, grass seed and mulch may be accomplished in a single operation with the use of approved hydroseeding equipment. The materials shall be mixed with water in the machine and kept in an agitated state in order that the materials may be uniformly suspended in the water. The slurry shall be of such consistency that it can be sprayed from a hydroseed gun or through at least 200 feet of 1 ½ inch diameter hose. The spraying equipment shall be so designed that when the solution is sprayed over an area, the resulting deposits of lime, fertilizer, grass seed, and mulch shall be equal to the specified quantities.
- B. Prior to the start of hydroseeding, the Contractor shall furnish to the Engineer, in writing, the weights of limestone, fertilizer, grass seed, mulch, tackifier (as required) and moisture retention agent (as required) per 100 gallons of water to be used. This statement should also specify the number of square yards of seeding that can be covered with the solution specified above. If the results of hydroseeding operations are unsatisfactory, the Contractor will be required to abandon this method and to apply the lime, fertilizer, grass seed and mulch by other means.
- C. Seed shall be incorporated with the mulching material to obtain a minimum hydroseeded sown coverage of 200 pounds of the specified seed mix per acre, as recommended by the seed suppliers, or as directed by the Engineer.
- D. Wood fiber mulch shall be uniformly spread over certain selected seeded areas at the minimum rate of 1,400 pounds per acre unless otherwise directed. Mulch shall be placed by spraying from an approved spraying machine with pressure sufficient to cover the entire area in a single operation.
- E. The Contractor shall immediately cleanup hydroseed oversprays from plant materials, pavements, furnishings, etc., to the satisfaction of the Engineer.

# 3.05 MAINTENANCE:

- A. The Contractor shall maintain and protect the entire seeded area, as necessary to ensure dense healthy growth, until completion of the guarantee period and final acceptance of the project, or for 60 days, whichever is longer. If lawns are planted in late summer or during the fall, maintenance shall continue through the following spring for at least 60 days. Maintenance shall include watering as specified, liming, fertilizing, removal of stones, control of weeds, insect pests and fungal pathogens, and regular mowing. Defective work shall be corrected as soon as possible after it becomes apparent and weather and season permit.
- B. The first cutting of lawn areas shall be done when the grass is between 2 <sup>1</sup>/<sub>2</sub> 3 inches in height. The lawn shall be cut no shorter than 2 inches in height and shall be regularly mowed as necessary to maintain the above-prescribed conditions. All cuttings shall be

removed from the lawn during the maintenance period and disposed of off-site. Cutting shall be accomplished with approved equipment that is weed free, clean of all herbicides and pesticides and has freshly sharpened blades. No mowing shall occur without inspection and approval of the Engineer.

- C. The Contractor shall be responsible to regularly water seeded areas with the equivalent of 1-inch minimum of rainfall per week, or as necessary to develop and sustain dense, green growth.
- D. Six weeks after turf has established, and only during the months of April, May, or September, the Contractor shall apply fertilizer as specified above, at one half the rate recommended by the initial soils laboratory tests, or as directed by the Engineer.
- E. The Contractor shall be responsible for securing all seeded areas from physical damage as necessary, including warning signs, barriers, temporary fencing, or other means of protection, through the guarantee period until final acceptance. All damaged areas shall be repaired to reestablish healthy vigorous growth of turf to the satisfaction of the Engineer, at no additional cost to the Owner. All temporary barriers shall remain the property of the Contractor and shall be removed by the Contractor upon final acceptance by the Engineer.
- F. Pavement shall be kept clean and clear of cuttings and debris at all times during the maintenance period to the satisfaction of the Engineer.
- 3.06 INSPECTION AND PRELIMINARY ACCEPTANCE:
  - A. At the beginning of the planting season following that in which the permanent grass crop is sown, seeded areas will be inspected. Any section not showing dense, vigorous growth shall be promptly reseeded by the Contractor at no additional cost to the Owner. The seeded areas shall be watered, weeded, cut and otherwise maintained by the Contractor, as many times as necessary, in accordance with these specifications, until they are accepted.
  - B. The Contractor shall provide written notice to the Engineer not less than 10 days before the anticipated date of inspection for preliminary acceptance. The Engineer shall recommend preliminary acceptance of the work of this Section only after completion and re-inspection of all necessary repairs, renewals, or replacements.
  - C. Inspection and acceptance of seeded areas may be requested and granted in part, provided the areas for which acceptance is requested are relatively substantial in size, and with clearly definable boundaries. Acceptance and use of these areas by the Owner shall not waive any other provisions of this Contract.
  - D. Refer to Appendix A Sand and Soil Amendments
- 3.07 GUARANTEE:
  - A. Seeded areas shall be guaranteed until final acceptance of the project, or, in the case of late summer or fall planting, the guarantee period shall extend through the following spring.

- B. When the work is accepted in part, the guarantee period shall extend from each partial acceptance to the terminal date of the last guarantee period. All guarantee periods terminate at one time.
- C. Guarantee shall not apply to the replacement of seeded lawns resulting from the removal, loss, or damage due to occupancy of the project in any part; vandalism or acts of neglect on the part of others; physical damage by animals, vehicles, etc.; and Acts of God, including but not limited to, catastrophic fire, hurricanes, riots, war, etc.
- D. In the instance of curtailment of water by local water authorities (when supply was to be furnished by the Owner), the Contractor shall furnish all necessary water by water tanker, the cost of which will be approved and paid for by the Owner.
- 3.08 FINAL INSPECTION AND FINAL ACCEPTANCE:
  - A. At the end of the guarantee period, the Contractor shall provide written notice to the Engineer not less than 10 days before the anticipated date of final inspection for final acceptance.
  - B. The Engineer shall recommend final acceptance of the work of this Section only after completion and re-inspection of all necessary repairs, renewals or replacements.

# END OF SECTION

#### SECTION 02300

### EARTHWORK

#### PART 1 - GENERAL

#### 1.01 WORK INCLUDED:

- A. Work included: The Contractor shall furnish all labor, materials, equipment and transportation required to complete Earthwork as indicated on the drawings, as designated by the Engineer, or as specified herein, and to complete all proposed work including but not limited to the following:
  - 1. Without limiting the generality thereof, Earthwork shall include excavating, furnishing borrow materials as necessary, and backfilling for the construction of all proposed work from existing grades to finished grades. Work shall include the removal of unclassified material, such as bituminous pavements, curbs, ledge and boulders under one (1) cubic yard in size, concrete, reinforced and plain, structures, and metal or wood posts; and unsuitable materials of every nature throughout the site within twelve (12) inches below finished subgrade elevations for proposed work or as indicated or required for new construction; transportation of the excavated materials; backfilling to proposed base course subgrades with approved excavated and/or furnished materials; and the legal disposal of unsuitable, and/or surplus excavated materials.
  - 2. Work under this Section shall also include the stripping, removing the turf and sod clumps and vegetation complete from existing topsoil, and the complete excavation, stockpiling, handling, amending to meet the requirements of Section 02910 of these Specifications, spreading, and re-use (placing) of the on-site topsoil in conformity with the lines, grades and dimensions shown on the plans. This material <u>may</u> be utilized where <u>general embankment</u> (not beneath pavements or structural improvements) is proposed at the sole discretion of the Owner. The Contractor shall take extreme care in the process of removing of the existing topsoil to insure that subsoil to remain in place is not mixed with the topsoil.
  - 3. Work under this Section shall include the furnishing of all borrow materials required to complete the proposed work as designed. Where "processed gravel", "gravel borrow", or "gravel" is indicated in the specifications or on the drawings, only Structural Fill conforming to this section of the specifications may be utilized.
  - 4. All topsoil/loam for sod, seed or plant material beds, whether re-used or furnished from off-site, shall conform to Section 02910 of these Specifications.
  - 5. The Contractor shall make excavations of normal depth in earth for trenches and structures, shall backfill and compact such excavations to the extent necessary, shall furnish the necessary material and construct embankments and fills, and shall make miscellaneous earth excavations and do miscellaneous grading.
- B. Site-Specific Issues:

- 1. Site preparation and earthwork will encounter cobbles, boulders, buried organics, and debris within the required excavation depths for site grading, foundations, pavements, utilities, and other site improvements. Completed explorations indicate subsurface conditions at specific locations only and only to the depths penetrated. They do not reflect subsurface conditions present between exploration locations. Variation of subsurface conditions should be anticipated.
- 2. Silty soils are highly susceptible to softening and disturbance by construction activity during wet or freezing weather. Subgrade protection is the responsibility of the contractor and special precautions and protective measures appropriate for the weather conditions during construction shall be used during earthwork and foundation construction to preserve the integrity of subgrades. Disturbed subgrades shall be repaired at the sole expense of the Contractor.
- C. Geotechnical Field and Laboratory Testing:
  - 1. The Owner will retain the services of a geotechnical testing laboratory to conduct laboratory analyses and field testing of soil materials required by this specification. Coordinate locations and types of field tests to be performed with the Engineer and cooperate in every way with the Engineer and testing laboratory during field testing and with collection of soil samples for laboratory testing.

### 1.02 RELATED WORK:

- A. Section 00320, SUBSURFACE INFORMATION
- B. Section 01350, PERMITS
- C. Section 01570, ENVIRONMENTAL PROTECTION
- D. Section 02230, CLEARING AND GRUBBING
- E. Section 02240, DEWATERING
- F. Section 02252, SUPPORT OF EXCAVATION
- G. Section 02290, SEEDING
- H. Section 02745, BITUMINOUS CONCRETE PAVING
- I. Section 02910, SCREENED LOAM BORROW AND TOPSOIL RE-USED

# 1.03 REFERENCES:

AASHTO - American Association of State Highway and Transportation Officials (tests or specifications). AASHTO or AASHO

AWWA - American Waterworks Association

American Society for Testing and Materials (ASTM)

- ASTM C 131 Test Method for Resistance to Degradation of Small Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.
- ASTM C136 Method for Sieve Analysis of Fine and Coarse Aggregates.
- ASTM C330 Specification for Lightweight Aggregate for Structural Concrete.

- ASTM DI 556 Test Method for Density of Soil in Place by the Sand Cone Method.
   ASTM D1557 Test Methods for Moisture-density Relations of Soils and Soil Aggregate Mixtures Using Ten-pound (10 Lb.) Hammer and Eighteen-inch (18") Drop.
   ASTM D2922 Test Methods for Density of Soil and Soil-aggregate in Place by Nuclear Methods (Shallow Depth).
- ASTM F-2396 04 Standard Guide for Construction of High Performance Sand-Based Rootzones for Sports Fields

Commonwealth of Massachusetts Highway Department Standard Specification for Highways and Bridges.

Code of Massachusetts Regulations (CMR) 310.40.0032 Contaminated Media and Contaminated Debris

Code of Massachusetts Regulations (CMR) 520 CMR 1400 Excavation & Trench Safety Regulations.

### 1.04 SUBMITTALS AND TESTING

- A. Refer to Section 01 33 23, Submittals, for submittal provisions and procedures.
  - 1. Backfill Materials: Submit 50-pound samples for each backfill material from each proposed source including on-site materials. Samples of off-site soil borrow for submission shall be collected in the presence of the Engineer so that the Engineer has the opportunity to see each borrow material at the source. Submit a grain size distribution curve performed in accordance with ASTM D422 and results of a moisture-density relationship determination in accordance with ASTM D1557 for each proposed backfill material for review by the Engineer. Additional samples and analysis shall be submitted if a change in material occurs at the borrow source.
  - 2. Excavation and Excavation Support Plan: Submit detailed work plans including engineering design calculations for excavation support and dewatering as required by the applicable sections.
  - 3. Within one week after making field adjustments, resubmit revised working drawings as necessary to reflect changes required by field conditions.

# 1.05 EXAMINATION OF SITE DOCUMNETS:

- A. It is hereby understood that the Contractor has carefully examined the sites and all conditions affecting work under this Section. No claim for additional costs will be allowed because of a lack of knowledge of existing conditions as indicated in the Contract Documents, or obvious from observation of the sites.
- B. Plans, surveys, measurements and dimensions under which the work is to be performed are believed to be correct, but the Contractor shall have examined them for himself during the bidding period and formed his own conclusions as to the full requirements of

the work involved.

# 1.06 EXISTING SITE AND SUBSURFACE CONDITIONS

Refer to Section 00320, Subsurface Data for information on site and subsurface conditions.

# 1.07 EXCAVATION CLASSIFICATIONS

- A. Earth Excavation or "Excavation" consists of removing materials encountered to the subgrade elevations indicated and subsequent reuse or disposal of the materials removed. All excavation is classified as earth excavation unless it otherwise meets the classifications provided below for unauthorized excavation, additional excavation, or rock excavation.
- B. Unauthorized Excavation consists of removal of materials beyond indicated subgrade elevations or dimensions without specific direction of the Engineer. Unauthorized excavation, as well as remedial work required by the Engineer, shall be at the Contractor's expense.
  - 1. Under footings, foundations, concrete slabs, retaining walls or other structures, fill unauthorized excavations to the proper elevations with Structural Fill as defined herein. Elsewhere, backfill and compact unauthorized excavations as specified for excavations of the same class, unless otherwise required.
- C. Additional Excavation:
  - 1. When excavation has reached required subgrade elevations, notify the Engineer, who will observe subgrade conditions.
  - 2. If unsuitable bearing materials are encountered at the required subgrade elevations, carry excavations deeper and to the lateral extent as required by the Engineer. Replace excavated material as required by the Engineer.
  - 3. Unsuitable materials are anticipated below proposed foundations as indicated in the logs included in Section 00320, Subsurface Data.
  - 3. Removal of unsuitable material and its replacement, other than those anticipated and to the depths indicated on the logs included in Section 00320 and required in Section 3.01, will be paid on the basis of contract conditions relative to changes in work or as provided for under the unit rates for this classification.
- D. Rock Excavation:
  - 1. Rock excavation in trenches and footing excavations includes removal and disposal of materials and obstructions encountered which cannot be excavated with a 1.0 cubic yard (heaped) capacity, 42-inch wide bucket on medium-size track-mounted hydraulic excavator equivalent to Caterpillar Model 215, rated at not less than 90HP flywheel power and 30,000 lb. drawbar pull. Trenches and footing excavations in excess of 10-feet in width are classified as open excavation.

- 2. Rock excavation in open excavations includes removal and disposal of materials and obstructions encountered which cannot be dislodged and excavated with modern track-mounted heavy-duty hydraulic excavating equipment without drilling or ripping. Rock excavation equipment is defined as Caterpillar Model No. 973 or No. 977K, or equivalent track-mounted loader, rated at not less than 170 HP flywheel power and developing 40,000-lb. breakout force (measured in accordance with SAE J732C).
- 3. Determination of rock excavation classification will be made by the Engineer. Typical of materials classified as rock are boulders 3.0 cubic yards or more in volume, solid rock, rock in ledges, and rock-hard cementitious aggregate deposits. Intermittent drilling or ripping performed to increase production and not necessary to permit excavation of material encountered will be classified as earth excavation. Do not perform rock excavation work until material to be excavated has been crosssectioned and classified by the Engineer. Visual observation of the completed excavation may be made by the Engineer to modify the excavation classifications. Removal of rock excavation prior to classification by the Engineer shall be considered as earth excavation unless accepted by the Engineer in writing. Such excavation will be paid on the basis of contract unit rates for this classification.

# 1.08 EXCAVATION

- A. Perform all excavations and of whatever materials encountered, in a manner as required to allow for placing of temporary earth support, forms, installation of pipe and other work, and to permit access for the purpose of observing the work. Excavations shall be to such widths as will give suitable space for the required work. Bottoms of trenches and excavations shall be protected from frost and shall be firm, dry and in an acceptable condition to receive the work. Work shall not be placed on frozen surfaces nor shall work be placed on wet or unstable surfaces.
- B. All excavations made in open cut will be controlled by the conditions existing at that location. In no case shall earth be excavated or disturbed by machinery so near to the finished subgrade for structures and pipelines as to result in the disturbance of the earth below the subgrade. The final excavation to subgrade should be accomplished with a smooth bladed bucket or by hand. Subgrades shall be observed by the Engineer prior to placement of overlying materials including fill, concrete forms, and rebar.
- C. The Contractor shall segregate and stockpile separately materials that are considered suitable for on-site re-use by the Engineer from unsuitable materials and materials requiring off-site disposal. Costs associated with off-site disposal of materials that are considered suitable for re-use by the Engineer, whether mixed with unsuitable materials or not, shall be borne by the Contractor.
- D. Temporary excavation support shall be provided in accordance with Section 02252, Support of Excavation.
- E. Dewatering shall be provided in accordance with Section 02240, Dewatering.

### 1.09 PERMITS, CODES, AND SAFETY REQUIREMENTS

- A. Comply with all rules, regulations, laws and ordinances of the municipality, the Commonwealth of Massachusetts, and other authorities having jurisdiction over the project site or work. All labor, materials, equipment and services necessary to make the work comply with these requirements shall be provided by the Contractor without additional cost to the Owner.
- B. Comply with the provisions of the Manual for Accident Prevention in Construction of the Associated General Contractors of America, Inc., and the requirements of the Occupational Safety and Health Administration, United States Department of Labor.
- C. The Contractor shall obtain and pay for all permits and licenses required to the complete work specified herein and shown on the Contract Drawings.
- D. The Contractor shall not close or obstruct any street, sidewalk, or passageway without written permission from authorities having jurisdiction unless otherwise indicated on the Contract Drawings. The Contractor shall conduct his operations as to minimize interference with the use of roads, driveways, or other facilities near enough to the work to be affected by the work.
- E. The Contractor shall notify "Dig Safe" at 1-888-DIG-SAFE prior to commencing any excavation work.
- F. The Contractor shall provide police details when working in roadways as required by local jurisdictional authorities. The Contractor shall pay for any and all details.

#### 1.10 PROTECTION OF EXISTING CONDITIONS

- A. All work shall be executed in such a manner as to prevent any damage to existing buildings, streets, curbs, paving, service utility lines, structures and adjoining property.
- B. Locate and mark underground utilities to remain in service before beginning the work. Protect all existing utilities to remain in service during operations. Do not interrupt existing utilities except when authorized in writing by authorities have jurisdiction unless otherwise indicated on the Contract Drawings.
- C. When an active utility line is exposed during construction its location and elevation shall be recorded on the Record Drawings by the Contractor and both the Engineer and the Utility Owner shall be notified in writing. Active utilities existing on the site shall be carefully protected from damage or relocated as required by the work.
- D. Inactive or abandoned utilities encountered during construction operations shall be removed or abandoned in place by completely filling with grout or Controlled Density Fill in a manner to prevent voids. The location of such utilities shall be recorded on the Record Drawings.
- E. Provide barricades, fences, lights, signs, and all other safety devices required to protect the public against injury.

- F. In case of any damage or injury caused in the performance of the work the Contractor shall, at his own expense make good such damage or injury to the satisfaction of, and without cost to, the Owner. Existing streets, sidewalks and curbs damaged during the project work shall be repaired or replaced to their condition prior to commencement of earthwork operations.
- G. Acceptance of any of the Contractor's plans, design calculations and methods of construction by the Designer shall not relieve the Contractor of the responsibility for the adequacy of the excavation lateral support system; preventing damage to existing or new structures, utilities and streets adjacent to excavations; the safety of persons working within excavated areas and the public at large; and excavation dewatering.

# 1.11 FROST PROTECTION AND SNOW REMOVAL:

- A. The Contractor shall, at its own expense, keep earthwork operations clear and free of accumulations of snow as required to carry out the work.
- B. The Contractor shall protect the subgrade beneath new structures and pipes from frost penetration when freezing temperatures are expected.

# 1.12 DISPOSAL

A. All excess and unsuitable excavated soil shall be removed from the site and legally disposed off-site by the Contractor at no additional cost to the Owner.

# PART 2 – PRODUCTS

- 2.01 BACKFILL MATERIALS:
  - A. **Screened Loam**: Screened Loam to be utilized for sodding, seeding and landscaping must conform to Section 02910, Screeded Loam Borrow in order to be used as Loam Borrow. Existing topsoil not passing tests for Loam Borrow may be considered suitable as general fill below subgrade, in landscaped areas only and may be utilized throughout the proposed sod and seeded areas, up to subgrades of proposed work.
  - B. **Common Borrow**: Common Borrow (Class B Backfill) shall be well-graded, natural inorganic soil containing no stone greater than 6 inches maximum dimension. The materials shall be free of trash, ice, snow, tree stumps, roots and other organic and deleterious materials. It shall be free of plastic clays, of all materials subject to decay or other materials that will corrode piping or metals. Common Borrow shall have a maximum dry density of not less than 110 pounds per cubic foot. It shall be of such a nature and character that it can be compacted to the specified densities. Topsoil shall not be considered Common Borrow.
  - C. **Gravel Borrow**: Gravel Borrow shall satisfy the requirements of MADOT Specification Section M1.03.0, Type b.
  - D. **Dense Graded Crushed Stone**: Dense Graded Crushed Stone shall satisfy the requirements listed in MADOT Specification Section M2.01.7.

- E. **Structural Fill**: Structural Fill shall satisfy the requirements of Gravel Borrow or Dense Graded Crushed Stone, above.
- F. **Crushed Stone**: Crushed Stone shall satisfy the requirements listed in MADOT Specification Section M2.01.2 (1-1/2 inch crushed stone). Crushed Stone separated from the surrounding soil with Filter Fabric as specified herein may be used as Structural Fill where approved by the Engineer.
- G. **Sand**: Sand shall satisfy the requirements listed in MADOT Specification Section M1.04. Sand is not to be used for Root Zone Mix Sand. Sand for Root Zone Mix shall be as specified in Section 02911: ROOT ZONE MIX PREPARATION & BLECAVATION
- H. Existing available soil materials from on-site excavations may be reused as Common Borrow or for Structural Fill provided the on-site materials meet the material requirements as described above.
- I. **Geotextile Fabric**: Geotextile fabric used for drainage and separation shall consist of a non-woven fabric made from polypropylene or polyethylene filaments or yarns. The fabric shall be inert to organic chemicals commonly encountered in the soil. The fabric shall conform to the following recommended property tests:

Property	Unit	Test Method	Minimum Value
Weight	oz/sy	ASTM D-5261	8.0
Grab Strength	lbs	ASTM D-4632	205
Grab Elongation	percent	ASTM D-4632	50
Trapezoid Tear Strength	lbs	ASTM D-4533	80
Mullen Burst Strength	psi	ASTM D-3786	350
CBR Puncture Strength	lbs	ASTM D-6241	500
Apparent Opening Size (AOS)	U.S. std. Size Sieve	ASTM D-4751	80

Edges of filter fabric shall overlap a minimum of one foot.

# PART 3 - EXECUTION

# 3.01 GENERAL REQUIREMENTS

- A. The Contract Drawings indicate the proposed finish alignments, elevations, and grades of the work. Establish the line and grade in close conformity with the Contract Drawings. The Engineer, however, may make minor adjustments in the field as necessary due to conditions encountered.
- B. The Contractor is responsible for establishing construction phasing, means, and methods and interim grading and temporary conditions required to attain the finish product

required by the Contract Documents. The Contractor is responsible for all construction, protection, movement, and maintenance of stockpiles. Establish and maintain suitable benchmarks and grade control to accurately perform the work.

- C. All excavations shall be performed in the dry. Excavation and dewatering shall be accomplished by methods, which preserve the undisturbed state of the subgrade soils.
- D. No excavation will be permitted below a line drawn downwards at 2 horizontal to 1 vertical from the underside of the closest edge of any in-place footing, utility, or other rigid site feature at a higher elevation without providing adequate sheeting and bracing (designed by a Professional Engineer in Massachusetts and retained by the Contractor) to prevent movement of the in-place footing or utility.
- E. When excavations have reached the prescribed depths, the condition of the bottom of the trench, subgrade, or foundation bearing surface shall be observed by the Engineer prior to placement of overlying materials including concrete forms and rebar. When excavating to subgrade level for pavement and hardscaping areas has been completed, the subgrade surface shall be observed by the Engineer prior to placement of overlying materials. After observation the Contractor will receive approval to proceed if conditions meet project requirements.
- F. All fill and organic soils shall be removed from the zone-of-influence of the shade shelter, the East Park northwest block retaining wall (near left field corner of baseball field), and other structure foundations to expose native, inorganic soils and replaced with Structural Fill. The zone-of-influence is defined by planes extending horizontally away from the outside edges of the foundations for 2 ft. and then down and away at a 1H:1V to the top of the native inorganic soils.
- G. Existing fill can remain below block retaining walls (except for the East Park northwest block retaining wall near left field corner of baseball field as discussed above), sport courts, field, and pavement areas provided the subgrades are prepared as recommended in this Section and observed by the Engineer.
- H. All subgrades in dry soils should be compacted until firm and stable with several passes of a minimum 10-ton vibratory roller or equivalent effort. Areas with limited access can be compacted using several passes of a 700-pound vibratory plate compactor or equivalent efforts. The Engineer shall observe all compaction efforts to evaluate subgrade stability.
- I. Soft and/or disturbed areas identified by the Engineer shall be removed and replaced with Structural Fill or Crushed Stone wrapped in filter fabric.
- J. No excavated material shall be deposited or stockpiled at any time to endanger portions of new or existing structures, either by direct pressure or indirectly by overloading areas contiguous to the operation. Material, if stockpiled, shall be stored so as not to interfere with the established sequence of the construction. If there is not sufficient area available for stockpiling within the limits of the project, the Contractor will be required to furnish his own area for stockpiling.
- K. When the plans require excavation in areas in close proximity to existing buildings, roads, structures and utilities it shall be the responsibility of the Contractor at his expense

to use satisfactory means and methods to protect and maintain the stability of such roads, and structures.

- L. Temporary ditches shall be made as needed to drain off surface water to avoid damaged to areas of cut or fill. Such ditches shall be maintained as required for efficient operations, at no additional cost to the Owner.
- M. Provide shoring, sheeting, and/or bracing at excavations, as required, to assure complete safety against collapse of earth at the side of excavations. Provide shoring of public utility lines where exposed in the excavations in accordance with rules and regulations of the local authorities, as no additional cost to the Owner.

### 3.02 FILLING AND BACKFILLING

- A. Subgrade Preparation: The subgrades for buildings, retaining walls, pavement areas, fields, and other site improvements shall be shaped to lines, grades, and cross-sections shown on the Contract Drawings and observed by the Engineer as described in Paragraph 3.01 E. These operations shall include any required reshaping and moisture conditioning to obtain proper re-compaction of loose granular materials. All soft or otherwise unsuitable material shall be removed and replaced with suitable material from excavation or borrow. The resulting area, and all other low sections, holes, or depressions shall be brought to the required grade with accepted material and the entire subgrade shaped to line, grade and cross-section and thoroughly compacted.
  - 1. Before surface or base materials are spread, the subgrade shall be shaped to an accurate and true surface conforming to the line and grades indicated on the Contract Drawings and described above. All surface irregularities shall be filled with suitable material or removed and such areas recompacted until the surface is properly shaped and properly compacted. A tolerance of 3/8- inch in paved areas and 1/2-inch in non-paved areas above or below the finished subgrade elevation will be allowed provided that this dimension above or below grade is not maintained for a distance longer than 50-feet and that the required crown is maintained in the subgrade. Any portion, which is not accessible to a roller, shall be thoroughly compacted by other mechanical or manual methods.
  - 2. All fills shall be placed in horizontal layers. Fill shall not be placed following the natural contours of the ground. Fill shall be placed starting in the lowest areas working up to finish grades in horizontal layers in the manner specified herein. Each layer of fill shall be benched into the existing slope in order to avoid the formation of a shear plane.
  - 3. Topsoil excavation and re-handling shall consist of discing and harrowing grassed and existing topsoil areas at ninety (90) degrees to each prior operation, and removing topsoil from all areas of proposed work and placing and grading the topsoil in embankment areas.
  - 4. All areas exhibiting grass or weed growth shall be stripped of growth and removed from topsoil loam borrow and shall be stored in stockpiles if necessary to ensure organic matter decomposition. Such on-site stockpiled topsoil must be tested prior to reuse, and treated to prevent weed growth during stockpile duration.

- 5. After the areas to receive topsoil loam borrow have been brought to subgrade, and immediately prior to placing and spreading such material, the subgrade shall be loosened by discing or rototilling to a depth of at least three inches to permit bonding of the finished material to the subgrade material. Then place and spread the loam borrow or skinned infield material to the depths required by the Drawings to establish finish grades. Refer to Topsoil Loam Borrow Specification.
- B. The vertical and lateral limits of Structural Fill below proposed footings and other rigid site improvements where fill and buried organics will be removed (the "zone of influence") shall be defined by a horizontal plane extending away from the outside bottom edge of the footings for two feet, then by a plane that slopes down and away from the foundation at a maximum 1H:1V slope to the natural inorganic soil subgrade. Structural Fill shall be placed within the zone described above in maximum 10-inch thick lifts measured prior to compaction. Each lift shall be thoroughly compacted to at least 95 percent of the maximum dry density as determined by Modified Proctor Compaction Testing (ASTM D1557).
- C. Backfill Material: Unless otherwise specified or directed, material used for filling and backfilling shall meet the material requirements specified herein. In general, the material used for backfilling utility trench excavations shall be material removed from the excavations provided that the reuse of these materials result in the required trench compaction and meets the following material requirements:
  - 1. Common Borrow for all unpaved areas around the sites.
  - 2. Structural Fill within three feet of finished grade below proposed pavements, tennis and basketball courts, and sidewalks. Common Borrow below these areas.
  - 3. All backfill placed within foundation, concrete pad, and retaining wall limits shall be Structural Fill unless otherwise specified.
  - 4. In areas where the bottom of the excavation is in fine sand and silt and is below the groundwater table, crushed stone may be placed and compacted in maximum 12-inch thick layers to provide a working mat and drainage layer. The crushed stone shall be separated on the top and all sides from adjacent material by geotextile fabric as specified herein.

Place backfill in a maximum loose lift thickness of 9-inches. Maintain backfill material with uniform moisture content, with no visible wet or dry streaking, and at a moisture content that allows compaction to the degree specified herein.

- D. Trench Backfill
  - 1. After the utility pipe installation has been inspected and approved, trenches shall be backfilled as soon as practicable with specified material. All trench backfilling shall be done with care.
  - 2. Backfill material for pipe bedding shall be deposited in the trench, uniformly on both sides of the pipe, for the entire width of the trench to the springline of the pipe. The backfill material shall be placed by hand shovels, in layers not more than 6-

inches thick in loose depth, and each layer shall be thoroughly and evenly compacted by tamping on each side of the pipe to provide uniform support around the pipe, free from voids.

- 3. The balance of backfill shall be spread in layers not exceeding 10-inches in loose depth. Each layer shall be thoroughly compacted by mechanical methods and shall contain no rock, stones or boulders larger than 4 inches in their greatest dimension.
- 4. All trench backfilling shall be done with special care and must be carefully placed so as not to disturb the work at any time; if necessary, a timber grillage or other suitable method shall be used to break the fall of the material. The moisture content of the backfill material shall be such that proper compaction will be obtained. Puddling of backfill with water will not be permitted. Backfill within areas to receive topsoil or pavement construction shall be made to grades required to establish the proper subgrade for the placement of topsoil or pavement base courses.
- 5. In backfilling trenches, each layer of backfill material shall be moistened and compacted to a density at least equal to that of the surrounding undisturbed earth, and in such a manner as to permit the rolling and compaction of the filled trench or excavation with the adjoining earth to provide the required bearing value, so that paving of the excavated and disturbed areas, where required, can proceed immediately after backfilling is completed.
- 6. Any trenches or excavations improperly backfilled or where settlement occurs shall be reopened, to the depth required for proper compaction, then refilled and compacted with the surface restored to the required grade and condition, at no additional expense to the Owner.
- 7. During filling and backfilling operations, pipelines will be checked by the Engineer to determine whether any displacement of the pipe has occurred. If the observation of the pipelines shows poor alignment, displaced pipe or any other defects they shall be remedied in a manner satisfactory to the Engineer at no additional cost to the Owner.
- F. Backfilling Against Structures
  - 1. Backfilling against masonry or concrete shall not be done until permitted by the Engineer. The Contractor shall not place backfill against or on structures until they have attained sufficient strength to support the loads (including construction loads) to which they will be subjected, without distortion, cracking or other damage. As soon as practicable after the structures are structurally adequate and other necessary work has been satisfactorily completed and approved, special leakage tests of the structures shall be made by the Contractor, as required by the Engineer. After satisfactory completion of leakage tests and satisfactory completion of any other required work in connection with the structures, backfilling around the structures shall commence using suitable and approved excavation material. The best of the backfill material shall be used for backfilling within 2-feet of the structure. Just prior to placing backfill, the areas shall be cleaned of all excess construction material and debris and the bottom of excavations shall be in a thoroughly

compacted condition. In general, use Structural Fill for backfilling against structures where the finished ground surface will be pavement or sidewalks; use Common Borrow where the finished ground surface will be lawn or landscaped areas.

- 2. Symmetrical backfill loading shall be maintained. Special care shall be taken to prevent any wedging action or eccentric loading upon or against the structures. During backfilling operations, care shall be exercised that the equipment used will not overload the structures in passing over and compacting these fills. Except as otherwise specified or directed, backfill shall be placed in layers not more than 9-inches in loose depth and each layer of backfill shall be compacted thoroughly and evenly using approved types of mechanical equipment. Each pass of the equipment shall cover the entire area of each layer of backfill.
- 3. In compacting and other operations, the Contractor shall conduct his operations in a manner to prevent damage to structures due to passage of heavy equipment over, or adjacent to, structures, and any damage thereto shall be made good by the Contractor at no additional expense to the Owner.
- G. After backfilling trenches and excavations, the Contractor shall maintain the surfaces of backfill areas in good condition so as to present a smooth surface at all times level with adjacent surfaces. Any subsequent settling over backfilled areas shall be repaired by the Contractor immediately, and such maintenance shall be provided by the Contractor for the life of this Contract, at no additional expense to the Owner.
- H. The completed and approved subgrades upon which topsoil is to be placed, or pavements are to be installed, shall not be disturbed by traffic of other operations and shall be maintained in a satisfactory condition until the base and finished courses are placed. The storage or stockpiling of materials on finished subgrade will not be permitted.
- I. Uniformly shape the surfaces of all areas to be graded, to the lines and grades indicated on the Contract Drawings, and as directed, including excavated and filled sections, embankments and adjacent transition areas, and all areas disturbed as a result of the Contractor's operations. The finished surfaces shall be reasonably smooth, compacted and free from surface irregularities.
- J. The Contractor is responsible to provide the finish grades as shown on the Contract Drawings. The Contractor shall provide temporary erosion control throughout the construction period to maintain all constructed lawns, and to protect all existing drains, catch basins, swales, from any debris or soil entering from excavation, backfill, or erosion. Contractor shall take whatever precautions are necessary to accomplish this temporary erosion control such as straw bales, silt fence, erosion control fabric, or pumping, at no additional cost to the Owner.

### 3.03 COMPACTION

A. Compaction Requirements: The degree of compaction is expressed as a percentage of the maximum dry density of the material at optimum moisture content as determined by ASTM Test D 1557, Method C. The compaction requirements are as follows:

Area	ASTM Density Degree of Compaction
In the zone of influence below foundations, retaining walls, slabs, and other structural features	95%
Pavement, basketball and tennis court, and field base courses	95%
Pavement, basketball and tennis court, and field subgrades	95%
General fill below pavement, basketball and tennis courts	95%
General fill below field subbases	85%
Trench backfill - below pavements	95%
- below landscaped areas	92%
- below structures	95%
All other areas	92%

# B. Moisture Control:

- 1. Fill that is too wet for proper compaction shall be disced, harrowed, or otherwise mixed and dried to a proper moisture content to allow compaction to the required density. If fill cannot be dried within 24 hours of placement, it shall be removed and replaced with drier fill.
- 2. Fill that is too dry for proper compaction shall receive water uniformly applied over the surface of the loose layer. Sufficient water shall be added to allow compaction to the required density.

# C. Compaction Control:

1. In-place density tests shall be made in accordance with ASTM D1 556, D2922, or D2167 as the work progresses, to determine the degree of compaction being attained by the Contractor. Any corrective work required as a result of such tests, such as additional compaction, or a decrease in the thickness of layers, shall be performed by the Contractor at no additional expense to the Owner. Additional in-place density testing shall be made at the Contractor's expense by the geotechnical testing laboratory. Testing locations shall be selected by the Engineer unless

otherwise noted.

- 2. In-place density tests shall be performed at a minimum according to the following:
  - a. One test per lift for each 5,000 square feet of basketball and tennis court fill.
  - b. One test for every fill lift below each footing.
  - c. A minimum of one test per lift for each 100 linear feet of trench.
  - d. One test per lift for each 10,000 square feet of parking lot, sidewalk, and pathway subgrade fill area.
  - e. One test per lift for each 100 linear feet of roadway fills.
  - f. one test per lift for each 1000 square feet of field area.

# 3.04 DISPOSAL OF SURPLUS MATERIALS:

- A. Surplus excavated materials, which are acceptable to the Engineer, shall be used to backfill normal excavations in rock or to replace other materials unacceptable for use as backfill. Upon written approval of the Engineer, surplus excavated materials shall be neatly deposited and graded so as to make or widen fills, flatten side slopes, or fill depressions; or shall be neatly deposited for other purposes as indicated by the Owner, within its jurisdictional limits; all at no additional cost to the Owner.
- B. Surplus excavated material not needed as specified above shall be hauled away and disposed of by the Contractor at no additional cost to the Owner, at appropriate locations, and in accordance with arrangements made by him. Disposal of all rubble shall be in accordance with all applicable local, state and federal regulations.
- C. No excavated material shall be removed from the site of the work or disposed of by the Contractor unless approved by the Engineer.
- D. The Contractor shall comply with Massachusetts regulations (310 CMR 40.0032) that govern the removal and disposal of surplus excavated materials. Materials, including contaminated soils, having concentrations of oil or hazardous materials less than an otherwise Reportable Concentration and that are not a hazardous waste, may not be disposed of at locations where concentrations of oil and/or hazardous material at the receiving site are significantly lower than the levels of those oil and /or hazardous materials present in the soil being disposed or reused.
- E. Soil testing, if required, for all materials to be reused on-site or removed and disposed of offsite, shall be the responsibility of the contractor. The City reserves the right to obtain its own test results from the same sample as the contractor without penalties to the owner. The contractor is required to obtain a large enough sample to divide with the owner for this proposes.

# END OF SECTION

#### SECTION 02329

#### TOPSOIL LOAM BORROW

#### PART 1 - GENERAL

#### 1.01 WORK INCLUDED:

- A. This Section covers all labor, materials, and equipment necessary to furnish and place Loam Borrow and all related work as indicated on the drawings and as herein specified.
- B. Existing on-site topsoil that has been stockpiled may be re-used provided it meets these specifications. The Contractor shall be solely responsible to determine if adequate quantities of on-site topsoil exist that may potentially be reused.
- 1.02 RELATED WORK:
  - A. Section 02300, EARTHWORK
  - B. Section 02920, SEEDING
  - C. Section 02930, TREES, SHRUBS, GROUNDCOVERS, AND LANDSCAPING
- 1.03 QUALITY ASSURANCE:
  - A. For each particular source of loam, the Contractor shall send representative samples totaling approximately 10 pounds of Loam Borrow to an approved State-certified testing laboratory.
  - B. Loam shall be subject to tests for Soluble Salts (1:2 soil-water ratio), Nitrogen (including nitrate and ammonium Nitrogen), Phosphorous, Potassium, Sulfate, Calcium, Magnesium, Aluminum, and Ferric Iron concentrations.
  - C. Loam shall also tested for heavy metals concentration, which shall include Boron, Cadmium, Zinc, Chromium, Copper, Lead, Manganese, and Nickel.
  - D. Mechanical gradation (textural analysis) as per USDA Soil Classification System and determine Organic matter content and the pH (1:1 soil-water ratio).
  - E. All tests shall be at the Contractor's expense. Laboratory test results shall state whether the Loam Borrow is acceptable as a planting medium, whether it needs to be amended, or if it fails to meet accepted requirements. Test results shall also include soil amendment and fertilizing recommendations and shall be forwarded to the Engineer at least 1month before any loaming is to be undertaken.
  - F. Samples and tests shall continue to be made at the Contractor's expense until Loam Borrow to be provided is found to be acceptable to the Engineer.

#### 1.04 SUBMITTALS:

In accordance with requirements of general specifications, the Contractor shall submit the following:

- A. One (1) electronic copy or Six (6) hard copies of information detailing the soil amendments including limestone, fertilizers, organic material amendments, and the name and address of the supplier and origin of Loam Borrow shall be submitted to the Engineer for approval.
- B. One (1) electronic copy or Six (6) hard copies of soils test results shall be submitted to the Engineer for review.

### PART 2 - PRODUCTS

### 2.01 MATERIALS:

- A. LOAM BORROW:
  - 1. Loam Borrow shall consist of, fertile, friable natural topsoil, typical of productive soils in the vicinity, obtained from naturally well-drained areas that have never been stripped. Loam Borrow shall be reasonably free of stumps, roots, heavy or stiff clay, stones larger than 1/2-inch in diameter, lumps, coarse sand, noxious weeds, sticks, brush or other litter.
  - 2. Loam Borrow shall be classified as a sandy loam by the USDA textural classification system as determined by sieve and pipette or hydrometer analysis. Loam Borrow shall have the following mechanical analysis:

Textural Class	Percent of Total Weight	Avg. Percentage
Sand $(0.05 - 2.0 \text{mm range})$	50 - 80	70
Silt $(0.002 - 0.05 \text{mm range})$	15 - 25	20
Clay (less than 0.002mm)	5 - 10	10

3. Loam Borrow shall contain not less than 4 percent or more than 7 percent organic matter as determined by the loss of weight by ignition of oven-dried samples. Test samples shall be oven-dried to a constant weight at a temperature of 230 degrees F.4. Loam Borrow shall not be excessively acid or alkaline, and shall not contain any phytotoxic materials or unacceptable concentration levels of any substance harmful to plant growth as determined by the soils testing laboratory. Loam Borrow shall have a pH value range between 5.0 and 6.5. Maximum soluble salt index shall be 100. The electrical conductivity (EC2) of a 1:2 soil-water suspension shall be less than or equal to 1.0 millimhos/cm. Aluminum concentration levels shall be less than 200ppm.

- 5. Loam Borrow shall not be worked, excavated, or delivered in a frozen or muddy condition. Soil structure shall not be destroyed through excessive and unnecessary handling or compaction.
- 6. Existing on-site topsoil may be re-used as Loam Borrow provided it meets these specifications.
- 7. All amendments to Loam Borrow shall be approved by the Engineer and shall be made in accordance with recommendations from the soils testing laboratory for use of Loam Borrow as a plant-growing medium and these specifications.

# B. LIMESTONE:

Lime shall be an approved agricultural limestone containing at least 50 percent total oxides (calcium oxide and magnesium oxide). The material will be ground such that 50 percent of the material will pass through a No. 100 mesh sieve and 98 percent will pass a No. 2 mesh sieve. Lime shall be uniform in composition, dry and free-flowing and shall be delivered to the site in the original sealed containers, each bearing the manufacturer's guaranteed analysis.

# C. FERTILIZER:

- 1. Fertilizer shall be a complete, standard commercial fertilizer, homogeneous and uniform in composition, dry and free-flowing, and shall be delivered to the site in the manufacturer's original sealed containers, each bearing the manufacturer's guaranteed analysis and marketed in compliance with State and Federal Laws. All fertilizer shall be used in accordance with the manufacturer's recommendations.
- 2. For Fertilizers containing Nitrogen, at least 50 percent of the nitrogenous elements shall be Urea-form or derived from organic sources and contain no less than 3 percent water-soluble Nitrogen.
- 3. Superphosphate shall be composed of finely ground phosphate rock as commonly used for agricultural purposes, containing not less than 18 percent available phosphoric acid.

# D. ORGANIC MATERIAL AMENDMENTS:

1. Organic compost shall be a standard commercial product comprised of fully decomposed, 100 percent plant-derived, natural organic matter. Its composition shall furnish ample water holding capacity and cation exchange capacity for the retention of plant nutrients. Compost shall be free of sticks, stones, weed seeds, roots, mineral or other foreign matter and delivered air dry. It shall be free from excessive soluble salts, heavy metals, phytotoxic compounds, and/or substances harmful to plant growth and viability. Organic compost shall have an acidity range of 4.5 to 7.0 pH.

- 2. Sphagnum Peat Moss shall be a standard commercial product. Its composition shall furnish ample water holding capacity and cation exchange capacity for the retention of plant nutrients. Peat moss shall be free of sticks, stones, weeds or weed seeds, roots, mineral or other foreign matter. It shall be free from toxic substances and/or compounds harmful to plant growth and viability. It shall be delivered air dry in standard bales and shall have an acidity range of 3.5 to 5.5 pH.
- 3. Humus shall be natural humus, reed peat, or sedge peat. Its composition shall furnish ample water holding capacity and cation exchange capacity for the retention of plant nutrients. Humus shall be free of sticks, stones, weeds, roots, mineral or other foreign matter and/or toxic substances harmful to plant growth and viability. It shall be low in wood content, free from hard lumps and excessive amounts of zinc and delivered air dry in a shredded or granular form. The acidity range for humus shall be 5.5 to 7.5 pH, and the organic matter content shall be not less than 85 percent, as determined by loss on ignition. The minimum water holding capacity shall be 200 percent by weight on an oven-dry basis.
- 4. Manure shall be well-rotted, leached, cow manure not less than 8 months or more than 2 years old. It shall be free of sawdust, shavings, or refuse of any kind and shall not contain more than 25 percent straw. It shall contain no substances harmful to plant growth. The Contractor shall furnish information regarding chemical disinfectants, if any, that may have been used in storage of the manure.

# PART 3 - EXECUTION

- 3.01 After approval of rough grading, the sub-base shall be raked to a depth of 3 inches to remove stones, rock or other foreign materials 3-inches or larger in dimension. The Engineer shall inspect the work for approval, prior to placing of Loam Borrow.
- 3.02 Loam Borrow shall be placed and spread to the required depths over the locations approved by the Engineer.
- 3.03 Lime shall be uniformly applied in accordance with the soil testing laboratory recommendations, or as required by the Engineer, at a maximum rate of 100 pounds per 1000 square feet per application, in necessary quantities to achieve the pH range requirements for Loam Borrow.
- 3.04 Fertilizer shall be uniformly applied in accordance with the soil testing laboratory recommendations, or as required by the Engineer. At slopes exceeding 25 percent gradient, fertilizer shall be applied manually in a manner approved by the Engineer. Fertilizer shall not be applied between June 15 and August 31.

3.05 Loam Borrow shall be worked by tilling or power raking to a minimum depth of 3-inches, thoroughly incorporating the lime and fertilizer into the soil. The Loam Borrow shall then be raked until the surface is finely pulverized and smooth and compacted with rollers, weighing between 75 and 100 pounds per linear foot of tread, to an even surface conforming to the prescribed lines, grades and depths indicated on the plans.

# END OF SECTION

#### SECTION 02370

#### EROSION AND SEDIMENTATION CONTROL

#### PART 1 - GENERAL

#### 1.01 SCOPE OF WORK:

A. Furnish all labor, materials, tools and equipment, and perform all operations necessary for erosion and sedimentation control work indicated on contract drawings and as specified herein.

#### 1.02 RELATED WORK:

- A. Section 01562, DUST CONTROL.
- B. Section 01570, ENVIRONMENTAL PROTECTION
- C. Section 02071, GEOTEXTILE FABRICS

#### 1.03 PROJECT CONDITIONS:

- A. Earthmoving activities in the project area shall be conducted in such a manner as to prevent accelerated erosion and the resulting sedimentation.
- B. The Contractor shall implement and maintain erosion and sedimentation control measures as shown on the contract drawings or as required by the Owner or Engineer from the start of construction until provisional acceptance of seeded areas, to effectively prevent accelerated erosion and sedimentation.

#### 1.04 SUBMITTALS:

A. The Contractor shall submit to the Engineer certification that the materials used for silt fence and hay bale construction meet the specifications.

#### 1.05 GENERAL METHODOLOGY:

- A. Erosion and sedimentation control methods shall consider all factors which contribute to erosion and sedimentation including, but not limited to, the following:
  - 1. Topographic features of the Project area.
  - 2. Types, depth, slope and areal extent of the soils.

- 3. Proposed alteration of the area.
- 4. Amount of run-off from the Project area and the upgradient watershed areas.
- 5. Staging of earthmoving activities.
- 6. Temporary control measures and facilities for use during earthmoving.

#### PART 2 - PRODUCTS

#### 2.01 MATERIALS:

- A. Hay Bales shall consist of rectangular shaped bales of hay weighing at least 40 pounds per bale. They shall be free of primary noxious weed seeds.
- B. Straw wattle shall consist of 99.9% weed-free wheat, oat, barley, or rice straw, compacted. Diameter may vary from  $\pm 13\%$ . Wattle netting is made out of non-woven photodegradable HDPE (high density polypropylene) with a 1 year UV inhibitor
- C. Silt Fence shall be a woven polypropylene and/or polyester material, which meets or exceeds the minimum average roll values requirements tabulated below:

Fabric Property	Test Method	Fabric Requirement
Tensile strength, lbs	ASTM D-4632 Grab	100 minimum
Elongation at 50% minimum tensile strength	ASTM D-4632 Grab	50% maximum
Permittivity, sec <sup>-1</sup>	ASTM D-4491	0.1 minimum
Apparent opening size, mm	ASTM D-4751	0.84 maximum
Ultraviolet degradation at 500 hours	ASTM D-4355	minimum 70% strength retained

C. Mulch, if used to protect the hydroseed from erosion, shall consist of cured straw free from primary noxious weed seeds, twigs, debris and rough or woody materials. Mulch shall be free from rot or mold and shall be acceptable to the Engineer or Owner. Alternately, mulch shall be specially processed cellulose homogeneous fiber containing no growth or germination-inhibiting factors. Processed cellulose fiber shall be manufactured in such a manner that after addition and agitation in slurry tanks with water, the fibers in the material become uniformly suspended to form a slurry when sprayed on the ground. The material shall allow homogeneous absorption and percolation of moisture. The manufacturer to show the air-dry weight content shall mark each package of the cellulose fiber. Mulch shall be utilized on all newly graded subgrade and topsoil areas that cannot be seeded within five (5) days.

### PART 3 - EXECUTION

### 3.01 CONSTRUCTION SEQUENCE:

- A. Construction of erosion control measures as depicted on drawings will be completed prior to any site work.
- B. Sediment barriers shall be used at locations shown on the drawings. Sediment barriers are temporary berms, diversions, or other barriers that are constructed to retain sediment on-site by retarding and filtering stormwater runoff.
- C. All temporary erosion control measures will be maintained throughout the course of site construction activities until provisional acceptance of the site vegetation by the Engineer or Owner, at which time the Contractor shall remove all remaining temporary erosion control structures, and properly dispose of accumulated sediment on-site in areas approved by the Owner.
- D. The Engineer or Owner may order additional erosion and sediment controls be installed. The Contractor shall comply with Engineer or Owner's request and immediately install the required controls.

#### 3.02 CONSTRUCTION METHODS:

A. Silt fences and/or staked hay bales and/or straw wattles shall be installed at the site down gradient of work areas as required by Owner or Engineer in the field. The silt fence shall be installed in accordance with manufacturer's instructions. Hay bales and straw wattles shall be placed at locations shown on the contract drawings, where erosion is noticed throughout the construction duration or approved by the Engineer. The base of all hay bales, straw wattles and silt fencing shall be embedded to the depths shown on the contract drawings.

- B. Straw mulch, if used, shall be applied at a rate of 100-lbs/1000 ft<sup>2</sup>.
- C. On slopes, the Contractor shall provide protection against washouts by an approved method. Any washout, which occurs either in the Contractor's work area or in areas topographically below his work, shall be regraded and reseeded at the Contractor's expense until an accepted vegetative stand is established.

# END OF SECTION

#### SECTION 02371

### RIPRAP

#### PART 1 - GENERAL

- 1.01 WORK INCLUDED:
  - A. This Section covers riprap for slope protection, drainage swales and pipe ends, complete.
  - B. Grading and compaction of earth slopes and other slope preparation for the riprap are included under other sections of the specification.
- 1.02 RELATED WORK:
  - A. Section 02300, EARTHWORK.
  - B. Section 02071, GEOTEXTILE FABRICS.
- 1.03 REFERENCES:
  - A. The following standard forms a part of these specifications and indicates minimum standards required:

Commonwealth of Massachusetts Highway Department Standard Specifications for Highways and Bridges.

#### PART 2 - PRODUCTS

- 2.01 MATERIALS:
  - A. PIPE ENDS:

Stone for pipe ends shall be angular and shall be in accordance with MHD Specification Section M2.02.3, Stone for Pipe Ends. The stone shall be light and dark beige in color.

B. GEOTEXTILE FABRIC:

Geotextile fabric shall be Soil Reinforcement Fabric as specified in Section 02071, GEOTEXTILE FABRICS.

# PART 3 - EXECUTION

# 3.01 INSTALLATION:

- A. Geotextile fabric shall be installed where shown on the drawings, prior to placing the riprap.
- B. Riprap for slope protection and pipe ends shall be placed on the prepared slope or area in a manner which will produce a reasonably well-graded mass of stone with the minimum practicable percentage of voids and a maximum void of 12 inches.
- C. Riprap shall be placed to its full course thickness in one operation and in such a manner as to avoid displacing the underlying material. Placing of riprap in layers or by dumping into chutes or by other similar methods likely to cause segregation will not be permitted.
- D. Riprap stones shall be placed and distributed such that there will be no large accumulation of either the larger or smaller stones in any given area.
- E. It is the intent of these specifications to produce compact riprap protection in which all required sizes of stone are placed in the proper proportions. Hand placing or rearranging of individual stones by mechanical equipment shall be utilized to the extent necessary to secure the desired results.
- F. All proposed riprap areas shall be a minimum 12" deep.

# END OF SECTION

## TRACER TAPE

## PART 1 - GENERAL

#### 1.01 WORK INCLUDED:

This section covers the furnishing, handling and installation of tracer tape, as called for on the drawings.

- 1.02 SUBMITTALS: IN ACCORDANCE WITH REQUIREMENTS OF GENERAL SPECIFICATIONS, SUBMIT THE FOLLOWING:
  - A. Six sets of manufacturer's literatures on the materials, colors and printing specified herein, shall be submitted to the Engineer for review.
  - B. Tape samples shall also be submitted to the Engineer for review.

#### PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS:

Tracer tape shall be by Reef Industries, Houston, TX; Empire Level, Mukwonago, WI; Pro-Line Safety Products Co., W. Chicago, IL; or approved equal.

- 2.02 TRACER TAPE:
  - A. Tracer tape shall be at least 3-inches wide.
  - B. Tracer tape for non-ferrous pipe or conduit shall be constructed of a metallic core bonded to plastic layers. The metallic tracer tape shall be a minimum 5-mil thick and must be locatable at a depth of 18 inches with ordinary pipe locaters.
  - C. Tracer tape for ferrous pipe or conduit shall consist of multiple bonded plastic layers. The non-metallic tracer tape shall elongate at least 500% before breaking.
  - D. The tape shall bear the wording: "BURIED DRAIN LINE BELOW" (with "DRAIN" replaced by "WATER, "SEWER", "ELECTRICAL", "GAS", "TELEPHONE", or "CHEMICAL" as appropriate), continuously repeated every 30 inches to identify the pipe.

E. Tape colors shall be as follows, as recommended by the American Public Works Association (APWA):

Electric	Red
Gas & Oil	Yellow
Communications	Orange
Water	Blue
Sewer & Drain	Green
Chemical	Red (not APWA)

# PART 3 - EXECUTION

- 3.01 INSTALLATION:
  - A. Tracer tape shall be installed directly above the pipe or conduit it is to identify, approximately 12 inches below the proposed ground surface.
  - B. The Contractor shall follow the manufacturer's recommendations for installation of the tape, as approved by the Engineer.

## CORRUGATED POLYETHYLENE [HDPE] DRAINAGE PIPE

#### PART 1 – GENERAL

#### 1.01 WORK INCLUDED:

- A. This section includes furnishing all materials, labor and equipment and installing corrugated polyethylene [HDPE] drainage pipe and fittings as shown on the drawings and as specified herein.
- 1.02 RELATED WORK:
  - A. Section 02300 EARTHWORK
  - B. Section 02252 SUPPORT OF EXCAVATION
- 1.03 REFERENCES:
  - A. The following standards form a part of this specification, as referenced:

American Society for Testing and Materials (ASTM

ASTM D2321	Standard for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity Flow Applications		
ASTM F405	Standard Specification for Corrugated Polyethylene Pipe and Fittings		
ASTM F667	Standard Specification for Large Diameter Corrugated Polyethylene Pipe and fittings		
American Association Of State Highway and Transportation Officials			
A A SUTO MOOA Standard Succification for Commented Delevelhology Dive			

- AASHTO M294 Standard Specification for Corrugated Polyethylene Pipe
- AASHTO MP6 Standard Specification for Corrugated Polyethylene Pipe 42" and 48" Diameter
- 1.04 SUBMITTALS: IN ACCORDANCE WITH REQUIREMENTS OF GENERAL SPECIFICATIONS, SUBMIT THE FOLLOWING:
  - A. Six sets of manufacturer's literature on the materials of this Section shall be submitted to the Engineer for review.
  - B. Manufacturer's certification that the product was manufactured, tested, and supplied in accordance with this specification shall be furnished.

## 1.05 DELIVERY, STORAGE AND HANDLING:

A. Pipe shall be packaged to withstand shipment without damage and handled carefully on the jobsite. Pipe shall be stored so that it is not exposed to sunlight.

## PART 2 – PRODUCTS

## 2.01 MATERIALS:

- A. This Section applies to corrugated polyethylene pipe with an integrally formed smooth interior.
- B. The nominal size for the pipe and fittings is based on the nominal inside diameter of the pipe.
- C. The pipe and fittings shall be free of foreign inclusions and visible defects. Fittings may be either molded or fabricated. Fittings supplied by manufacturers other than the supplier of the pipe shall not be permitted without the approval of the Engineer. The ends of the pipe shall be cut squarely and cleanly so as not to adversely affect joining.

## 2.02 MANUFACTURERS:

A. Pipe and fittings shall be manufactured by Ipex, Inc.; Plexco, Division of Chevron Chemical Co.; J-M Pipe Co.; Advanced Drainage Systems, Inc. (ADS) or approved equal.

## PART 3 – EXECUTION

## 3.01 INSTALLATION:

- A. Pipe interiors, fitting interiors, and joint surfaces shall be thoroughly cleaned before installation. Pipes and fittings shall be maintained clean.
- B. Pipes shall be installed in the locations and to the required lines and grades shown on the drawings and provided in these Specifications, using an approved method of control.
- C. Excavations shall be maintained free of water during the progress of the Work. No pipes shall be laid in water, nor shall there by any joints made up in water.
- D. If any defective pipe is discovered after being placed, removal and replacement with sound pipe will be required at no additional cost to the Owner.
- E. The 2-inch trench drainage pipe shall be laid by a Wiz Wheel trencher, AFT 45 or better, or approved equal.

#### PRECAST MANHOLES AND CATCH BASINS

#### PART 1 - GENERAL

#### 1.01 WORK INCLUDED:

This Section covers all precast manholes and catch basins complete, including, but not limited to, bases, walls, cones, mortar, inverts, frames and covers.

- 1.02 RELATED WORK:
  - A. Section 02300, EARTHWORK
  - B. Section 02745, PAVING
  - C. Section 03302, FIELD CONCRETE
- 1.03 SYSTEM DESCRIPTION:
  - A. Precast sections shall conform in shape, size, dimensions, materials, and other respects to the details indicated on the drawings or as ordered by the Engineer.
  - B. All manholes and catch basins shall have concrete bases. Concrete bases shall be precast unless otherwise specified. Invert channels shall be formed of brick and mortar upon the base.
  - C. Catch basins shall have a 2-foot deep sump unless otherwise specified.
  - D. Riser and cone sections shall be precast concrete.
- 1.04 REFERENCES:
  - A. The following standards form a part of this specification as referenced:

#### American Society for Testing and Materials (ASTM)

ASTM A48	Gray Iron Castings
ASTM C32	Sewer and Manhole Brick
ASTM C144	Aggregate for Masonry Mortar
ASTM C207	Hydrated Lime for Masonry Purposes

ASTM C478	Precast Reinforced Concrete Manhole Sections
ASTM C923	Specification for Resilient Connectors Between Reinforced Concrete Manhole Structures and Pipes
ASTM C1244	Standard Test Method for Concrete Sewer Manholes by the Negative Air Pressure (Vacuum) Test.

American Association of State Highway and Transportation Officials (AASHTO)

AASHTO M198Joints for Circular Concrete Sewer and Culvert Pipe Using Flexible Watertight Gaskets

Occupational Safety and Health Administration

OSHA 29 CFR 1910.27 Fall Prevention Protection

Form 816 – State of Connecticut, Department of Transportation, Standard Specifications for Roads, Bridges and Incidental Construction 2004, including Supplemental Specifications

- 1.05 SUBMITTALS: IN ACCORDANCE WITH REQUIREMENTS OF GENERAL SPECIFICATIONS, SUBMIT THE FOLLOWING:
  - A. Six sets of manufacturer literature of the materials of this section shall be submitted to the Engineer for review.
  - B. Tests reports as required shall be submitted to the Engineer.

## PART 2 - PRODUCTS

- 2.01 PRECAST CONCRETE SECTIONS:
  - A. All precast concrete sections shall conform to ASTM C478 with the following exceptions and additional requirements:
    - 1. The wall thickness of precast sections shall be as designated on the drawings, meeting the following minimum requirements:

Section Diameter (Inches)	Minimum Wall Thickness (Inches)
48	5
60	6
72	7
84	8

- 2. Type II cement shall be used except as otherwise approved.
- 3. Sections shall be steam cured and shall not be shipped until at least five days after having been cast.
- 4. Minimum compressive strength of concrete shall be 4000 psi at 28 days.
- 5. No more than two lift holes may be cast or drilled in each section.
- 6. The date of manufacture and the name or trademark of the manufacturer shall be clearly marked on the inside of each precast section.
- 7. Acceptance of the sections will be on the basis of material tests and inspection of the completed product.
- 8. Circumferential steel reinforcement in walls and bases shall be a minimum of 0.12 sq. in./lin. ft. for 4-foot diameter sections and 0.15 sq. in./lin. ft. for 5- and 6-foot diameter sections. Reinforcing shall extend into tongue and groove.
- B. Conical reducing sections shall have a wall thickness not less than 5-inches at the bottom and wall thickness of 8-inches at the top. Conical sections shall taper from a minimum of 48-inches diameter to 24 or 30-inches diameter at the top, as shown on the drawings.
- C. Except where insufficient depth of cover dictates the use of a shorter base, bases shall be a minimum of 4 feet in height.
- D. Slab top sections and flat riser sections (Grade Rings) shall conform to the contract drawings, with particular attention focused upon the reinforcing steel and be designed to meet or exceed an H-20 Loading requirement.
- E. The tops of the bases shall be suitably shaped by means of accurate ring forms to receive the riser sections.
- F. Precast sections shall be manufactured to contain wall openings of the minimum size to receive the ends of the pipes, such openings being accurately set to conform with line and grade of the sewer or drain. Subsequent cutting or tampering in the field, for the purpose of creating new openings or altering existing openings, will not be permitted except as directed by the Engineer.
- G. "Drop-over" manholes shall be placed where indicated on the drawings. The Contractor shall accurately measure the diameter of the existing outlet pipe and inform the manufacturer of its size, so that the "Drop-over" type opening can be cut into the precast manhole base. The bottom shall be cast in place by the Contractor in accordance with Section 03302, FIELD CONCRETE. The invert channel shall be formed of brick and mortar, as specified in this specifications section. The sub-base shall be a compacted,

level foundation of crushed stone, at least 6-inches thick, as specified in Section 02300 EARTHWORK, but shall vary to the depth necessary to reach sound undisturbed earth.

- H. The exterior surfaces of all precast manhole bases, walls, and cones shall be given a minimum of one shop coat of bituminous dampproofing.
- I. The Engineer reserves the right to reject any unsatisfactory precast section and the rejected unit shall be tagged and removed from the job site immediately.
- J. The Engineer may also require the testing of concrete sections as outlined under <u>Physical Requirements</u> in ASTM C478 with the Contractor bearing all testing costs.
- K. Precast Concrete Sections shall meet the minimum requirements as indicated on the Town of Greenwich, Standard Construction Details included in the plans.

## 2.02 BRICK MATERIALS:

- A. Brick shall be sound, hard, and uniformly burned brick, regular and uniform in shape and size, of compact texture, and satisfactory to the Engineer. Bricks shall comply with ASTM C32, for Grade SS, hard brick, except that the mean of five tests for absorption shall not exceed 8 percent by weight.
- B. Rejected brick shall be immediately removed from the work and brick satisfactory to the Engineer substituted.
- C. Mortar shall be composed of portland cement, hydrated lime, and sand in which the volume of sand shall not exceed three times the sum of the volumes of cement and lime. The proportions of cement and lime shall be as directed and may vary from 1:1/4 for dense hard-burned brick to 1:3/4 for softer brick. In general, mortar for Grade SS Brick shall be mixed in the volume proportions of 1:1/2:4-1/2; portland cement to hydrated lime to sand.
- D. Cement shall be Type II portland cement as specified for concrete masonry.
- E. Hydrated lime shall be Type S conforming to ASTM C207.
- F. The sand shall comply with ASTM C144 specifications for "Fine Aggregate," except that all of the sand shall pass a No. 8 sieve.
- G. Brick Materials shall meet the minimum requirements as indicated on the Town of Greenwich, Standard Construction Details included in the plans.
- 2.03 FRAMES, GRATES, COVERS AND STEPS:
  - A. Castings shall be of good quality, strong, tough, even-grained cast iron, smooth, free from scale, lumps, blisters, sandholes, and defects of every nature which would render

them unfit for the service for which they are intended. Contact surfaces of covers and frame seats shall be machined to prevent rocking of covers.

- B. All castings shall be thoroughly cleaned and may be subject to a careful hammer inspection at the Engineer's discretion.
- C. All castings (frames, grates, covers, steps, etc.) shall meet the minimum requirements as indicated on the Town of Greenwich, Standard Construction Details included in the plans.
- D. Grates for Drain Basins within exposed aggregate concrete shall be bronze, 15-inch square, light-duty as manufactured by Nyloplast.
- E. Grates for Drain Basins in non-concrete areas shall 15-inch round, light-duty as manufactured by Nyloplast.
- 2.04 SEWER MANHOLE ACCESSORIES:
  - A. Gasket materials shall be top grade (100% solids, vulcanized) butyl rubber and shall meet or exceed AASHTO M-198.
  - B. Couplings at the manhole-pipe interface shall be made with a rubber seal system (with or without stainless steel straps) meeting the requirements of ASTM C923 and recommended for this type of connection.
  - C. Stubs installed as specified and indicated on the drawings shall be short pieces of the same class pipe as that entering the manhole and shall have either stoppers or end caps as shown on the drawings. Stoppers or end caps shall be especially designed for that application.

## 2.05 AREA DRAINS, AREA MANHOLES AND DRAIN BASINS

- A. Drain Basins shall be manufactured by Nyloplast, or approved equal.
- B. Drain Basins shall have sumps for capture of debris and sediment.

## PART 3 - EXECUTION

- 3.01 INSTALLATION:
  - A. PRECAST SECTIONS:
    - 1. Precast bases shall be supported on a compacted level foundation of crushed stone, as specified in Section 02300 EARTHWORK, at least 6-inches thick, but shall vary to the depth necessary to reach sound undisturbed earth.

- 2. Precast reinforced concrete sections shall be set vertical and with sections in true alignment.
- 3. Butyl rubber joint sealant shall be installed between each concrete section. Catch basin sections do not require joint sealant if so indicated on the drawings.
- 4. All holes in sections used for handling the sections shall be thoroughly plugged with mortar. Mortar shall be one part cement to 1-1/2 parts sand, mixed slightly damp to the touch (just short of "balling"), hammered into the holes until it is dense and an excess of paste appears on the surface, and then finished smooth and flush with the adjoining surfaces.

## B. BRICK WORK:

- 1. Bricks shall be moistened by suitable means, as directed, until they are neither so dry as to absorb water from the mortar nor so wet as to be slippery when laid.
- 2. Each brick shall be laid as a header in a full bed and joint of mortar without requiring subsequent grouting, flushing or filling, and shall be thoroughly bonded as directed.
- 3. The brick inverts shall conform accurately to the size of the adjoining pipes. Side inverts shall be curved and main inverts (where direction changes) shall be laid out in smooth curves of the longest possible radius which is tangent to the centerlines of adjoining pipe.

## C. CASTINGS:

- 1. Cast iron frames, grates and covers shall be as specified. The frames and covers shall be set by the Contractor to conform accurately to the grade of the finished pavement, existing ground surface, or as indicated on the drawings. Frames shall be adjusted to meet the street surface.
- 2. Cast iron manhole frames and covers not located in paved areas shall be set 6-inches above finished grade, at a height as directed by the Engineer, or as indicated on the drawings. The top of the cone shall be built up with a minimum of 1 course and a maximum of 5 courses of brick and mortar used as headers for adjustment to final grade.
- 3. Frames shall be set concentric with the top of the concrete section and in a full bed of mortar so that the space between the top of the concrete section or brick headers and the bottom flange of the frame shall be completely filled and made watertight. A thick ring of mortar extending to the outer edge of the concrete shall be placed all around the bottom flange. The mortar shall be smoothly finished to be flush with the top of the flange and have a slight slope to shed water away from the frame.

- 4. Covers and/or grates shall be left in place in the frames, for safety reasons, except while work is being performed.
- D. ACCESSORIES:
  - 1. Accessories shall be installed in accordance with manufacturer's instructions.
  - 2. Stubs shall be set accurately to the dimensions indicated on the drawings. Stubs shall be sealed with suitable watertight plugs.
- 3.02 LEAKAGE TESTS:
  - A. Leakage tests shall be made by the Contractor and observed by the Engineer on each manhole. The test shall be by vacuum or by water exfiltration as described below:
  - B. VACUUM TEST:
    - 1. The vacuum test shall be conducted in accordance with ASTM C1244. Test results will be judged by the length of time it takes for the applied vacuum to drop from 10 inches of mercury to 9 inches. If the time is less than that listed in Table 1 of ASTM C1244, the manhole will have failed the test. Test times from Table 1 are excerpted below.

## TABLE 1

Depth (Feet)	Diameter (Inches)486072		
		Times (Seconds)	
0-12	30	39	49
12-16	40	52	67
16-20	50	65	81
20-24	59	78	97
26-30	74	98	121

## Minimum Test Times for Various Manhole Diameters

2. If the manhole fails the initial test, the Contractor shall locate the leaks and make proper repairs. Leaks may be filled with a wet slurry of accepted quick setting material. If the manhole should again fail the vacuum test, additional repairs shall be made, and the manhole water tested as specified below.

## C. WATER EXFILTRATION TEST:

1. After the manhole has been assembled in place, all lifting holes shall be filled and pointed with an approved non-shrinking mortar. All pipes and other openings into the manhole shall be suitably plugged and the plugs braced to prevent blow

out. The test shall be made prior to placing the shelf and invert. If the groundwater table has been allowed to rise above the bottom of the manhole, it shall be lowered for the duration of the test.

- 2. The manhole shall be filled with water to the top of the cone section. If the excavation has not been backfilled and observation indicates no visible leakage, that is, no water visibly moving down the surface of the manhole, the manhole may be considered to be satisfactorily water-tight. If the test, as described above, is unsatisfactory as determined by the Engineer or if the manhole excavation has been backfilled, the test shall be continued. A period of time may be permitted if the Contractor so wishes, to allow for absorption by the manhole. At the end of this period, the manhole shall be refilled to the top of the cone, if necessary, and a measuring time of at least 8 hours begun. At the end of the test period, the manhole shall be refilled to the top of the cone, measuring the volume of water added. This amount shall be extrapolated to a 24-hour loss rate and the leakage determined on the basis of depth. The leakage for each manhole shall not exceed one gallon per vertical foot for a 24-hour period. If the manhole fails this requirement, but the leakage does not exceed 3 gallons per vertical foot per day, repairs by approved methods may be made as directed by the Engineer to bring the leakage within the allowable rate of one gallon per foot per day. Leakage due to a defective section or joint or exceeding the 3 gallon per vertical foot per day, shall be cause for rejection of the manhole. It shall be the Contractor's responsibility to uncover the rejected manhole as necessary and to disassemble, reconstruct or replace it as directed by the Engineer. The manhole shall then be retested and, if satisfactory, interior joints shall be filled and pointed.
- 3. No adjustment in the leakage allowance will be made for unknown causes such as leaking plugs, absorption, etc. It shall be assumed that all loss of water during the test is a result of leaks through joints or through the concrete. Furthermore, the Contractor shall take any steps necessary to assure the Engineer that the water table is below the bottom of the manhole throughout the test.
- 4. If the groundwater table is above the highest joint in the manhole, and there is no leakage into the manhole, as determined by the Engineer, such a test can serve to evaluate water-tightness of the manhole. However, if the Engineer is not satisfied with the results, the Contractor shall lower the water table and carry out the test as described hereinbefore.

## 3.03 CLEANING:

All new manholes shall be thoroughly cleaned of all silt, debris and foreign matter of any kind, prior to final inspection.

## REINFORCED CONCRETE PIPE

## PART 1 - GENERAL

1.01 WORK INCLUDED:

This Section covers the furnishing and installation of reinforced concrete pipe, complete.

- 1.02 RELATED WORK:
  - A. Section 02300, EARTHWORK
  - B. Section 02631, PRECAST MANHOLES AND CATCH BASINS
- 1.03 QUALITY ASSURANCE:
  - A. Acceptance of pipe will be on the basis of plant load-bearing tests, material tests, and inspection of the complete product. The required tests are enumerated herein. The quality of all materials used in the pipe, the process of manufacture, and the finished pipe shall be subject to inspection by the Engineer, at the place of manufacture or on the work site after delivery or at both locations. The pipe will be subject to rejection at any time if it fails to meet the specification requirements, even though sample pipe units may have been accepted as satisfactory at the place of manufacture. Rejected pipe shall be promptly removed from the project site by the Contractor.
  - B. All tests shall be made in accordance with the latest applicable ASTM specifications, which are as follows:
    - 1. <u>Reinforcing Steel</u>. Mill test reports, or reports on samples taken from each shipment to the pipe manufacturer, shall be submitted for reinforcing steel to be used on this project stating that the reinforcing meets the specified requirements.
    - 2. <u>Cement</u>. Mill test reports shall be submitted for each shipment to the pipe manufacturer of cement to be used on this project stating that the cement meets the specified requirements. Flyash may be used as specified in ASTM C76.
    - 3. <u>Aggregates</u>. Test reports shall be submitted stating that the aggregates to be used on this project meet the requirements of ASTM C33 except that the requirements for gradation shall not apply. The first report shall be submitted prior to the manufacture of any pipe for this project. Additional tests and reports shall be made monthly thereafter during the production of the pipe.
    - 4. <u>Absorption Tests</u>. Three cores shall be taken from each pipe unit that is to be load tested. The cores shall be taken before the load-bearing tests are performed. All

cores shall be tested for absorption. Absorption results shall not exceed the requirements of ASTM C76.

- 5. <u>Pipe Unit Load-Bearing Tests</u>. A load-bearing test shall be made on one pipe unit of each size and class to be furnished and the report of the test shall be submitted before that size and class of pipe unit is delivered. An additional test will be required for each 200 units of each size and class of pipe. The load-bearing test shall be performed after the cores for the absorption tests have been taken. Each load-bearing test shall be carried to the specified load to produce the 0.01-inch crack. If the 0.01-inch crack is not formed until the specified load is reached, the pipe unit may be used in the project.
- C. The Owner may have any or all pipe units inspected or tested, or both, by a lab designated by the Owner. Such additional inspection and/or tests shall be at the Owner's expense and shall be the test results of record.
- D. All pipe units to be tested shall be selected at random by the Owner. Unless otherwise approved, all load-bearing tests on pipe units shall be made in the presence of the Owner.
- 1.04 **REFERENCES**:
  - A. The following standards form a part of this specification and indicate the minimum standards required:

American Society for Testing and Materials (ASTM)

ASTM	C33	Specification for Concrete Aggregates	
ASTM	C76	Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe	
ASTM	C361	Reinforced Concrete Low-Head Pressure Pipe	
ASTM	C443	Joints for Circular Concrete Sewer and Culvert Pipe, Using Rubber Gaskets	
ASTM	C655	Reinforced Concrete D-Load Culvert, Storm Drain, and Sewer Pipe	
ASTM	C924	Standard Practice for Testing Concrete Pipe Sewer Lines by Low-Pressure Air Test Method	
American Society of Civil Engineers (ASCE)			
ASCE	Vol. 90 No. SA2	Journal of Sanitary Engineering Division	
Part			
Aprı	1 1964		

# 1.05 SUBMITTALS: IN ACCORDANCE WITH THE REQUIREMENTS OF GENERAL SPECIFICATIONS, SUBMIT THE FOLLOWING:

- A. Six sets of shop drawings of reinforced concrete pipe, fittings, and gaskets shall be submitted to the Engineer for review.
- B. The Contractor shall submit to the Engineer certified copies in triplicate of test results on each batch of each size and class of pipe, for the materials and for the finished pipe units as described herein. If less than 100 units of a given size and class of pipe are required, the Contractor may submit certified copies of tests made on identical pipe units produced within the past year.
- C. Design calculations and reinforcing configurations for special classes of pipe and certified copies of test results of tests itemized in Subsection 1.03 of this specification shall be submitted to the Engineer for record purposes.
- D. Before shop drawing submittals are processed, the Owner or Engineer may elect to visit and inspect the proposed concrete pipe manufacturer's plant.
- 1.06 DELIVERY/STORAGE
  - A. Pipe sections shall not be stored on areas over newly laid pipe or other existing pipelines which might be damaged by the superimposed load. Storage of sections shall be restricted to approved areas.
  - B. Prior to installation, gaskets shall at all times be stored in a location with a minimum temperature of 50°F. Any gaskets not meeting the above requirements shall be rejected and promptly removed from the site.

## PART 2 - PRODUCTS

- 2.01 MATERIAL:
  - A. PIPE:
    - 1. The pipe shall be reinforced concrete pipe manufactured by an established manufacturer of good reputation in the industry and in a permanent plant adapted to meet all the design requirements of the pipe.
    - 2. Pipes 24-inches in diameter and smaller shall be of the bell and spigot type. Pipes larger than 24-inches may be bell and spigot or tongue and groove.
    - 3. The pipe shall have an interior surface which is smooth and even, free from roughness, projections, indentations, offsets, or irregularities of any kind. Pipe shall conform to the latest requirements of ASTM C76 and shall be Wall B or Wall C for the class indicated on the drawings, and with additions and exceptions as follows:

- a. Type II cement shall be used unless otherwise approved by the Engineer. Admixtures shall not be used except with prior approval of the Engineer.
- b. Elliptical reinforcement will not be permitted. Longitudinal reinforcement shall be continuous. Reinforcement shall have a minimum cover of <sup>3</sup>/<sub>4</sub>-inches.
- c. Absorption shall be as specified under Quality Assurance.
- d. Concrete pipe shall be manufactured by a vibratory process such as a packerhead or Vihy process. Concrete cast in vertical forms shall be dry mix concrete consolidated by internal or external mechanical vibration or both. The vibrating equipment shall be operated at high speed (more than 5,000 rpm) and have a low amplitude. Pipes manufactured by the modified packerhead process shall have a supplementary concrete densification operation that shall assure the attainment of full bond between reinforcement and concrete and also eliminate any displacement of the reinforcement. Additional passes with the revolving packerhead or the use of additional vibrators attached to the platform or exterior forms will not be acceptable.
- e. Pipe units shall have a minimum laying length of 8 feet except as otherwise indicated or approved by the Engineer.
- f. Pipe units shall not be shipped until the concrete has reached its 28 day design strength.
- g. Mortar used for repairs shall have a minimum compressive strength of 4,000 psi at the end of 7 days and 5,000 psi at the end of 28 days for use with reinforced concrete pipe up to Class IV, and a compressive strength of 6,000 psi at the end of 7 days and 7,000 psi at the end of 28 days for use with reinforced concrete Class V pipe when tested in 3-inch by 6-inch cylinders stored in the standard manner. Only those repairs permitted by the above-mentioned ASTM C76 will be allowed.
- h. The date of manufacture, class of pipe unit, size of pipe units, consecutive number of pipe unit, and trademark of the manufacturer shall be clearly and permanently marked on the inside or outside at one end of each pipe unit.

## B. PIPE JOINTS/GASKETS:

1. Pipe joints shall conform to ASTM C433. Pipe joints shall be of the rubber gasket type in which the gaskets are in compression and which will permit both longitudinal and angular movement. The ends shall be designed to confine the gasket when the joint is in its final position. Each unit of pipe shall be provided with proper ends made of concrete formed on machined rings to ensure accurate joint surfaces.

2. The gaskets sealing the joint shall be made of natural rubber, synthetic rubber, or a blend of both having a texture to assure a watertight and permanent seal and shall be the product of a manufacturer having at least five years' experience in the manufacturing of rubber gaskets for pipe joints. The gasket shall be of a solid circular cross section having a composition and texture which is resistant to common ingredients of sewerage, industrial wastes, and groundwater and which will endure permanently under the conditions likely to be imposed by this service. The gasket shall conform to Section 5, Materials and Manufacture for Gaskets, ASTM C443.

## PART 3 - EXECUTION

## 3.01 INSTALLATION:

- A. Pipe shall be laid to the lines and grades indicated on the drawings or given by the Engineer. Each pipe unit shall be so laid as to form a close joint with the next adjoining pipe and bring the inverts continuously to the required grade.
- B. Each pipe unit shall be handled into its position in the trench only in such manner and by such means, as the Engineer approves as satisfactory. The Contractor will be required to furnish approved devices to permit satisfactory supports of all parts of the pipe unit when it is lifted.
- C. The Contractor shall take all necessary precautions to prevent flotation of the pipe in the trench.
- D. Where so indicated on the drawings, the pipe shall be supported by compacted crushed stone, concrete cradle or envelope or any other bedding material as specified or as shown on the plans. Crushed stone shall be as specified under Section 02300 EARTHWORK.
- E. When each pipe unit has been properly bedded, enough of the backfill material shall be placed and compacted between the pipe and the sides of the trench to hold the pipe in correct alignment.
- F. Where a concrete cradle or envelope is used, the pipe shall be laid on concrete saddles and braced, so as to provide both vertical and lateral support for the pipe while the cradle or envelope is being placed. The location, dimensions and class of concrete required for cradle or envelope are indicated on the drawings.
- G. After the pipe units are aligned in the trench and are ready to be jointed, all joint surfaces shall be cleaned. Immediately before jointing the pipe, the groove shall be lubricated in accordance with the manufacturer's recommendation. Each pipe unit shall then be carefully pushed into place without damage to pipe or gasket. Suitable devices shall be used to force the pipe together so that they will fit with a minimum open recess inside and outside and have tightly-sealed joints. Care shall be taken not to use such force as to wedge apart and split the groove ends. Joints shall not be "pulled" or "cramped" without approval of the Engineer.

- H. Immediately after the pipe units are put together, the position of the gasket in the joint shall be inspected using an approved feeler gage furnished by the Contractor, to be sure it is properly put together and is tight. Joints where the gasket is damaged or not properly positioned shall be pulled apart and remade using a new gasket.
- I. Details of gasket, attachment, and joint formation shall follow the directions of the manufacturers of the joint material and of the pipe, all subject to review by the Engineer.
- J. No pipe or fitting shall be permanently supported on saddles, blocking or stones.
- K. At all times when pipe laying is not actually in progress, the open ends of pipe shall be closed by temporary watertight plugs or by other approved means. If water is in the trench when work is resumed, the plug shall not be removed until all danger of earth or other materials entering the pipe has passed.

## 3.02 REPAIR OF PIPE:

Chipped, gouged or damaged pipe shall be repaired if the defects affect the structural integrity of the pipe. Surface imperfections need not be repaired. The pipe shall be repaired by an authorized representative of the pipe manufacturer following a repair procedure approved by the Engineer. The repaired pipe will be inspected by the Engineer prior to being used on the project.

## 3.03 FIELD QUALITY ASSURANCE:

- 1. On completion of a section of drain, the Contractor shall clean and TV inspect the section in accordance with Section 02440, Sewer Cleaning and Inspection at no additional cost to the Owner.
- 2. The Contractor shall be responsible for the satisfactory water-tightness of the entire section of the drain. Should the Engineer determine that the sections inspected are unsatisfactory, the Contractor shall do all work required to locate and repair the defects and re-inspect as the Engineer may require without additional compensation.
- 3. A plan of the method for repairing any defects that are found shall be submitted to the Engineer for review.

#### SUBGRADE DETENTION SYSTEM

#### PART 1 - GENERAL

#### 1.01 WORK INCLUDED:

- A. The Contractor shall furnish all labor, materials, equipment and incidentals required and install the sub-grade detention system.
- 1.02 RELATED WORK:
  - A. Section 02300, EARTHWORK
  - B. Section 02745, PAVING
  - C. Section 03302, FIELD CONCRETE
- 1.03.1 QUALITY CONTROL INSPECTION:
  - A. The quality of materials, the process of manufacture, and the finished sections shall be subject to inspection by the Engineer. Such inspection may be made at the place of manufacture, or on the work site after delivery, or at both places, and the sections shall be subject to rejection at any time if material conditions fail to meet any of the specification requirements, even though sample sections may have been accepted as satisfactory at the place of manufacture. Sections rejected after delivery to the site shall be marked for identification and shall be removed from the site at once. All sections which have been damaged beyond repair during delivery will be rejected and, if already installed, shall be repaired to the Engineer's acceptance level, if permitted, or removed and replaced, entirely at the Contractor's expense.
  - B. All sections shall be inspected for general appearance, dimensions, soundness, etc. The surface shall be dense, close textured and free of blisters, cracks, roughness and exposure of reinforcement.
  - C. Imperfections may be repaired, subject to the acceptance of the Engineer, after demonstration by the manufacturer that strong and permanent repairs result. Repairs shall be carefully inspected before final acceptance. Cement mortar used for repairs shall have a minimum compressive strength of 4,000 psi when tested in accordance with ASTM C-109. Epoxy mortar may be utilized for repairs.
- 1.04SUBMITTALS: IN ACCORDANCE WITH REQUIREMENTS OF GENERAL SPECIFICATIONS, SUBMIT THE FOLLOWING:

## A. Shop Drawings

Structural design calculations and shop drawings shall be certified by a Professional Engineer retained by the system manufacturer or Contractor and licensed in the state where the system is to be installed. Six (6) copies of said shop drawings shall be submitted to the Engineer for review and approval.

B. Affidavit on patent infringement

The Contractor shall submit to the Engineer, prior to installation of the subgrade detention system, an affidavit regarding patent infringement rights stating that any suit or claim against the Owner due to alleged infringement rights shall be defended by the Contractor who will bear all the costs, expenses and attorney's fees incurred thereof.

C. Manufacturing Experience

The subgrade detention suppliers shall provide evidence of at least 5 years of successful product design and use. The supplier shall provide an installation list of projects, model sizes installed and installation dates where the same type systems as specified herein have been designed and produced by the supplier.

D. Operation and Maintenance Manuals

Furnish six copies of the operation and maintenance manuals for the subgrade detention system.

## PART 2 - PRODUCTS

## 2.01 MATERIALS AND DESIGN:

A. Sub-Grade Detention System

The Sub-Grade Detention System shall be a Stormtech MC-3500 Chamber System as manufactured by Stormtech LLC, or approved equal.

## PART 3 - EXECUTION

- 3.01 INSTALLATION:
  - A. The subgrade detention system shall be constructed according to the sizes shown on the Drawings and as specified herein. Install at elevations and locations shown on the Drawings or as otherwise directed by the Engineer.
  - B. The system shall be installed according to the plans and details and in compliance with the manufacturer's requirements.

## END OF SECTION

## 02636-2

## BITUMINOUS CONCRETE PAVEMENT AND COLOR SEALCOAT

#### PART 1 - GENERAL

#### 1.01 WORK INCLUDED:

- A. Under this Section, the Contractor shall furnish all necessary labor, materials, equipment, and transportation necessary to construct the following:
  - 1. The bituminous concrete pavement for the courts and walks shall be composed of materials as specified herein and shall be constructed on a prepared base course to the depth, grade and cross-section shown on the plans, as specified herein and as required by the Engineer.
  - 2. Unless otherwise specified in the Contract Drawings, pedestrian bituminous concrete pavement shall be composed of a one and a half (1.5) inch bituminous concrete binder course, and a one and a half (1.5) inch bituminous concrete dense mix course. Heavy-duty bituminous concrete pavement at sport courts shall be composed of a two and a half (2.5) inch bituminous concrete binder course, and a one and a half (1.5) inch bituminous concrete binder course, and a one and a half (1.5) inch bituminous concrete binder course, and a one and a half (1.5) inch bituminous concrete dense mix course. Heavy-duty bituminous concrete pavement at roadways and parking areas shall be composed of a two and a half (2.5) inch bituminous concrete binder course, and a one and a half (1.5) inch bituminous concrete top course.
  - 3. Where an overlay is proposed, the depth of the bituminous concrete dense mix shall be typically one and one-half (1 <sup>1</sup>/<sub>2</sub>) inches except that it shall be of greater depth in places to eliminate puddling. Tack coat shall be applied utilizing Type SS-1 asphalt emulsion.
  - 4. Color sealcoating of bituminous concrete pavements as shown on the plans and as specified herein.
- 1.02 RELATED WORK:
  - A. Section 01330, SUBMITTALS
- 1.03 REFERENCE STANDARDS AND SPECIFICATIONS:
  - A. Reference to the standards, specifications and tests of technical societies, organizations and governmental bodies are made in the Contract Documents.
    - 1. AASHTO American Association of State Highway and Transportation Officials (tests or specifications).

- 2. ASTM American Society for Testing and Materials.
- 3. MassDOT Standard Specs. Latest edition of the <u>Standard Specifications for</u> <u>Highways and Bridges</u>, Massachusetts Department of Transportation, hereinafter referred to as the "Massachusetts Standard Specifications."
- 1.04 SUBMITTALS:
  - A. Asphalt emulsion Type SS-1 product and application specification.
  - B. Color Sealcoat: The Contractor shall submit catalog cuts, manufacturer's specifications and color chips or charts.
  - C. Field layout of color sealcoat must be approved by Engineer prior to installation.
  - D. Submit catalog cuts and manufacturer's specifications for Airport Grade Asphalt Emulsion Mix and Aggregate.
  - E. Compaction tests are required on all bituminous concrete base surfaces on a 25 foot grid interval or per Owner's direction. At the Contractor's expense, an independent testing agency must perform the work and submit the results directly to the Engineer.
- 1.05 QUALIFICATIONS/SPECIAL REQUIREMENTS COLOR SEALCOAT APPLICATION:
  - A. The Contractor shall engage the manufacturer's representative to inspect and monitor the application of the initial filler coat upon the prepared surfaces of all pavements to receive color sealcoat.
  - B. If a latex-ite acrylic sealer/surfacer is to be utilized, the addition of silica by mechanical agitation on-site shall be inspected and monitored by the manufacturer's representative who is to be engaged by the Contractor at the Contractor's cost.
  - C. Adequate means shall be provided to protect the color seal coating(s) from damage until such time that each layer has cured sufficiently and no seal will adhere to and be picked up by the tires of vehicles or by pedestrian traffic.
  - D. No color seal coating shall be applied during any period within which rain or subapplication temperatures are predicted within forty-eight (48) hours, unless otherwise specified by the manufacturer.
- 1.06 GUARANTEE/WARRANTY:
  - A. The pavement and coatings shall be guaranteed against defects in workmanship or quality for a period of one (1) year after final acceptance. The Contractor shall replace, repair,

recoat or otherwise make satisfactory to the Owner any unacceptable pavement and or coating at no additional cost to the Owner

## PART 2 - PRODUCTS

## 2.01 BITUMINOUS CONCRETE PAVEMENT:

A. Bituminous Concrete Pavement shall consist of binder mix and dense mix courses constructed to the thicknesses shown on the plans and shall conform to the relevant provisions of Sections 460 and (M3.11.03) of the Massachusetts Standard Specifications, unless specified otherwise hereinafter.

## B. <u>Base/Binder Courses</u>

1. Base/Binder Courses shall be Bituminous Concrete Pavement, Dense Finish Course Type I-1.

## C. <u>Leveling/Overlay Courses</u>

- 1. Leveling/Overlay Courses may conform to "Surface Treatment" mix, Table A, Section M3.11.03 of the MassDOT Standard Specifications, comprised of Class I Dense Bituminous Concrete, Type ST or Dense Mix Type I-1, at the Contractor's option.
- 2. The general composition of the bituminous concrete mixture (the proportion of asphalt cement to mineral aggregate) shall be in accordance with MassDOT requirements.
- 3. The mineral aggregate composition for Type ST shall be as follows:

TYPE ST SIEVE ANALYSIS U.S. Standard Sieve No.	MINERAL AGGREGATE Percent Passing by Weight (per ASTM C-136)	
Size	Minimum	Maximum
3/8	100	-
4	96	100
8	85	100
16	55	85
30	25	60
50	15	40
100	3	15
200	2	7

## 2.02 ASPHALT EMULSION:

- A. Asphalt emulsion tack coat shall be Type SS-1 or SS-1H as specified by the Asphalt Institute.
- 2.03 TROWELABLE ASPHALT FILLER/PATCH:
  - A. Airport grade asphalt emulsion mix and aggregate shall be used to repair gouges or cracks which can then be brought to grade to receive an overlay or color sealcoat.
- 2.04 COLOR SEALCOAT:
  - A. The layout and design of color sealcoating shall be installed per contract drawings.
  - B. The two (2) filler coats shall be Plexipave as manufactured by California Products Corporation, 169 Waverly Street, Cambridge, Massachusetts, or approved equal. Colors shall be as indicated on the plans. The two (2) Plexipave filler coats shall be applied to the cleaned bituminous pavement as specified hereunder. It shall be non-flammable upon exposure to flame. The filler coats shall contain a minimum of 9 lb./gal. of Silica, 100 percent (100%) passing a 100% mesh as pre-mixed at the manufacturer's plant. No sand or silica shall be added to the emulsion in the field. The bituminous pavement shall cure for fourteen (14) days prior to applying the Plexipave Acrylic Color System.
  - C. Water, if approved, may be added to the Plexipave emulsion mixes. In no case may the quantity of water in the filler coat emulsion mix exceed thirty-three percent (33%) of the emulsion volume. (One (1) part water: two (2) parts filler coat). In no case may the quantity of water in the finish coat emulsion mix exceed fifty percent (50%) of the emulsion volume. (One (1) part water: one (1) part finish coat). Water shall be potable and its temperature above forty degrees F (40°F) upon addition to the emulsions.
  - D. The color emulsion coating shall be California Products Company's "Plexichrome" or an approved equal emulsion product. Colors shall match those of the Plexipave filler coats. The Plexichrome shall be applied lengthwise of the court with a wide type pushbroom.
  - E. The base vehicle for the finish coat shall be an acrylic polymer dispersed in water and which has the ability to withstand extremes in temperature and general weathering. The film former shall provide a non-skid surface upon drying and under all weather conditions. Pigment dispersions in the color coating are to be of the best quality chrome oxides so as to obtain a permanent true color. The coating shall contain no material, which will cause cracking due to extremes in temperatures and is to be factory mixed and consistent in color. It shall be a one hundred percent (100%) acrylic emulsion containing no alkyds, butadiene styrene, or vinyls and shall be thinned with water. It shall not chalk or discolor any equipment.
  - F. The finished surface shall be smooth and uniform, true to required grade and cross section, and free of depressions, ridges, or other irregularities.

## PART 3 - EXECUTION

#### 3.01 BITUMINOUS CONCRETE PAVEMENT:

- A. Bituminous concrete pavements shall be constructed on a prepared foundation of gravel in accordance with the Massachusetts Standard Specifications, Section 405, except where overlayment is over existing pavement.
- B. The bituminous mixtures shall be placed on the approved base only when, in the opinion of the Engineer, the course is sufficiently dry and weather conditions are suitable.
- C. Where walls, curbing, or other suitable permanent supports are not present, the Contractor shall secure proper alignment and adequate compaction of the binder and surface courses as shown on the Contract Drawings and finish all edges with a <u>neat tamped edge</u>.
- D. The mixture shall be placed in two (2) courses as shown on the Contract Drawings. Each course shall be spread and finished as required in the Massachusetts Highway Department, Standard Specifications for Highways and Bridges, Section 460.63, latest edition.
- E. All adhesive fabric shall be in place and approved prior to completing this work.
- F. After completion, the bituminous concrete courses shall conform to the thickness shown on the Contract Drawings, smooth and even and of a dense and uniform structure. When tested with a sixteen (16) foot straight edge placed parallel to the centerline of the pavement, there shall be no deviation from a true surface in excess of one-quarter (1/4) inch.
- 3.02 ASPHALT EMULSION TACK COAT:
  - A. Apply a single very thin (0.05 to 0.15 gallons per square yard) application of diluted asphalt emulsion (Type SS-1) to all existing surfaces to be paved against or overlaid to cover the entire surface of existing pavement.
  - B. Essential qualities of coverage are (1) it must be very thin and (2) uniformly cover entire surface of existing pavement.
  - C. Place only that amount of tack coat which can be overlaid with new pavement by the end of each day, and; **IF RAIN IS ANTICIPATED DO NOT APPLY TACK COAT.**
- 3.03 COLOR SEAL COAT:
  - A. The bituminous concrete pavement shall cure for fourteen (14) days prior to applying the Color Sealcoat System where specified.
  - B. The Contractor shall furnish and apply to the approved bituminous pavements so

designated on the plans: two (2) filler coats and one (1) finish coat of acrylic emulsion color coating.

- C. Prior to application of the filler coats, all dirt, sand, dust, and other loose material shall be cleaned from the paved areas to be covered, by sweeping and pressure washing with water. All surfaces shall be dry prior to starting any color seal coating process. The Contractor shall take special precautions to assure that existing pavements are thoroughly cleaned and that all cracks or joints in existing pavements are repaired in conformance with these specifications and to the satisfaction of the Owner. Limits or areas to be color coated shall be taped with minimum two (2) inch wide tape true as to alignment prior to application of the color coating material.
- D. The two (2) filler coats shall be applied so that both coats are of a total quantity and with a uniform spread at the rate of one (1) gallon per each one hundred (100) square feet of surface area. Additional filler coating material is to be used if necessary to complete the court surfaces satisfactory to the Supervisor. The first coat shall be applied length-wise of the court or drive and the second coat cross-wise of the court or drive.
- E. Apply one (1) acrylic color emulsion coating to the properly prepared surfaces with a uniform spread at the rate of one (1) gallon per each two hundred (200) square feet of surface area after the filler coat applications have been completed and approved. The color emulsion coating shall be California Products Company's "Plexichrome" or an approved equal emulsion product. Colors shall match those of the Plexipave filler coats. The Plexichrome shall be applied lengthwise of the court or drive with a wide type pushbroom.
- F. The entire system of two (2) filler coats and one (1) finish coat shall be applied with approved squeegees and hair-type pushbrooms, respectively. The material shall be thoroughly mixed by mechanical agitation and all work shall be done in a thorough and workmanlike manner. The emulsion shall be thoroughly stirred in its container as received, by stationery bucket power mixer, so that a creamy, smooth consistency of all the emulsion in the container is assured for ready application. The entire work of color coat surfacing shall be done in accordance with the recommendations of the manufacturer's representative. Special care shall be taken so as to allow none of the material to spatter or flow beyond the perimeter of areas to be covered. The filler coats and finish coat shall not be applied in foggy or rainy weather, or when ambient temperature is below forty-five degrees F (45°F), nor shall they be applied if such conditions are anticipated during the next forty-eight (48) hours.
- G. The finished surface shall be smooth and uniform, true to required grade and cross section, and free of depressions, ridges, or other irregularities.

# END OF SECTION

Document146

## STABILIZED STONE DUST PAVEMENT

## PART 1 - GENERAL

#### 1.01 SCOPE OF WORK

A. The work to be done under this Section shall be the furnishing, placement and compaction of stabilized stone dust surfacing as shown on the drawings and as specified herein. The Contractor shall be responsible for supplying the material, labor, equipment and transportation necessary to do the work.

#### 1.02 SAMPLES

- A. Prior to ordering and delivering materials to the site, (1) representative samples of stone dust shall be sent to the Owner's Representative for approval. The material shall be analyzed by a certified testing laboratory and certified by the supplier as a byproduct of a stone quarry operation.
- B. The color shall be medium to dark gray when wet and consistent throughout. Samples must match that product which is to be installed.

#### PART 2 - MATERIALS

#### 2.01 STONE DUST

- A. Stone dust shall be the product of a stone crusher and shall consist of inert materials that are hard, durable stone, free from surface coatings and deleterious materials.
- B. Gradation requirements shall be as follows:

U.S. Sieve No.	Percent Passing by Weight
# 4	100
# 8	96
# 16	68
# 30	43
# 50	29
# 100	17
# 200	11

## 2.02 STABILIZER

- A. Non-toxic, non-staining water-activated soil stabilizer.
- B. "STABILIZER" by Stabilizing Solutions, Inc. Phoenix, AX 1-800-336-2468 or approved equal.

## PART 3 - EXECUTION

- 3.01 The stone dust shall be placed over a previously approved and installed compacted base of gravel as detailed and as specified under Section 02300 of these Specifications.
- 3.02 The stone dust shall be placed to the line and grades shown on the plans and shall consist of a minimum of the detailed thickness after watering and compacting to ninety-five percent (95%) of the maximum dry density of the material as determined by the Standard AASHO Test Designation T99 compaction test Method C at optimum moisture content as determined by the Landscape Architect.
- 3.03 Compaction shall continue until the surface is even and true to the proposed lines and grades within a tolerance of three-eighths (3/8) inch above or below the required cross-sectional elevations and to a maximum irregularity not exceeding three-eighths (3/8) inch under a ten (10) foot line longitudinally. Any specific area of material sub-base which, after being rolled, does not form a satisfactory, solid, stable foundation shall be removed, replaced and recompacted by the Contractor without extra compensation.
- 3.04 The soil stabilizer shall be carefully measured and shall be subsequently blended with the stonedust at the manufacturers recommended rate for three (3) inch compacted stabilized stonedust pathways. (If 'STABILIZER' brand stabilizer is used the blending ratio shall be as follows: One (1) pound of 'STABILIZER' powder per one and one-quarter (1 <sup>1</sup>/<sub>4</sub>) cubic feet of stonedust OR as otherwise stated; one (1) pound of 'STABILIZER' powder per five (5) square feet of surface area for three (3) inch compacted depth stone dust.)

## PAVEMENT MARKINGS

## PART 1 - GENERAL

## 1.01 SCOPE OF WORK

- A. The work of this Section consists of furnishing all labor, equipment, and materials necessary to paint all lines and symbols at the locations shown on the plans and in accordance with these Specifications, and to perform all layout necessary to accurately locate and paint lines and handicap parking symbols.
- B. All parking stall lines shall be painted white.

## PART 2 - MATERIALS

2.01 Materials shall meet the appropriate requirements specified in the following subsections of MassDOT, Division III, Materials:

General Requirements for Paints and Protective Coatings	M7.00.00
White Traffic Paint	M7.01.05
Striping Powder	M7.01.12

#### PART 3 - EXECUTION

## 3.01 GENERAL:

- A. All equipment used for the application of pavement markings shall be of standard commercial manufacture. All other equipment and devices necessary for the application of the pavement markings and protection thereof and for the protection to the traveling public shall be as usually required for work of this type and shall be furnished by the Contractor.
- B. The pavement marking shall be operated at the speed and in accordance with other requirements of the manufacturer, unless otherwise directed by the Engineer.
- C. Truck mounted equipment is approved for the application of pavement markings except in such cases where in the Engineer's judgment travel will be unreasonably delayed and/or the quality of the work performed by the machine is unsatisfactory.

## 3.02 LAYOUT OF WORK:

- A. A schedule of pavement marking operations shall be furnished by the Contractor for the approval of the Engineer prior to the application of any pavement markings. This schedule must be in the office of the Engineer 7 days prior to the proposed date of application of any pavement markings.
- B. The Engineer will provide at a convenient location on the roadway a line of reference for use by the Contractor in establishing the location of markings. The line of reference shall be at a maximum of 50 foot intervals by means deemed satisfactory by the Engineer. All markings shall follow the line of reference without deviation. Any line deviating from the establishing control of incorrect width shall be reapplied, as directed by the Engineer in accordance with Subsection 860.62.

# 3.03 APPLICATION OF MARKINGS:

Pavement markings shall be applied as follows:

Material	Line Thickness	Reflectorized Bead Application
M7.01.05	15 mils	6lbs/gal

- A. No thinners shall be used for the above listed pavement marking applications except in accordance with the manufacturer's specifications and at the direction of the Engineer.
- B. No paint or pavement marking material shall be heated above the temperature marked on the container. Markings shall be applied only in seasonable weather and in accordance with good painting practices.
- C. The surface shall be dry and free of sand, grease, oil or other foreign substances prior to the application. The Contractor shall prepare the surface to accept the application as part of this item, with no additional compensation. The Engineer will make the final determination for all of the foregoing.
- D. Bituminous concrete pavements shall have been in place for 48 hours prior to the application of pavement markings except preformed permanent plastic pavement markings which can be applied immediately. When it is necessary to expedite the

flow of traffic, the Engineer may reduce the waiting period as is deemed necessary.

- E. If for any reason material is spilled or tracked on the highway, or any markings applied by the Contractor, in the Engineer's judgment, fail to conform to Subsection 860.61, because of a deviation from the desired pattern, the Contractor shall remove such material by a method that is not injurious to the roadway surface and is acceptable to the Engineer, clean the roadway surface and prepare the surface for a reapplication of markings and reapply the markings as directed without additional compensation for any of the foregoing corrective operations.
- F. The ambient (air) temperature for line painting application is to be a minimum of 45 °F and rising at the time of marking operations. If work has started and air temperatures fall below 45 °F and continuous cooling is indicated, work shall be stopped. In cool weather conditions, temporary drops down to 40 °F will be tolerated, providing temperatures also vary upwards. Sustained striping (greater than one hour) at 40 °F shall not be allowed. Starting work at air temperatures lower than 45 °F shall not be allowed.

# 3.04 PROTECTION OF MARKINGS:

A. Markings shall remain protected until sufficiently dry to bear traffic on roadways that are open to traffic. Markings shall be protected by traffic cones of not less than 28 "in height.

## PART 4 - GUARANTEE AND ACCEPTANCE

4.01 A. Painted lines shall be guaranteed for a period of one (1) year from final acceptance, against cracking, peeling, checking, or other defect. The Contractor will repair, recoat or otherwise make satisfactory, any failed lines, at no cost to the Owner.

## CURBING

#### PART 1 - GENERAL

- 1.01 WORK INCLUDED:
  - A. Fabricate, furnish and install precast concrete and granite curbing, as indicated on the Drawings and as specified.
- 1.02 RELATED SECTIONS:
  - A. Section 02220 DEMOLITION
  - B. Section 02746 BITUMINOUS CONCRETE PAVING AND COLOR SEALCOAT
  - C. Section 03300 CAST-IN-PLACE CONCRETE
- 1.03 REFERENCES:
  - A. Comply with applicable requirements of the following standards and those others referenced in this Section, under the provisions of Section 01420 REFERENCES.
    - 1. ASTM C 131 Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine
    - 2. Commonwealth of Massachusetts Department of Transportation (MassDOT): Standard Specifications for Highway and Bridges
- 1.04 SUBMITTALS:
  - A. Submit the following under provisions of these specifications:
    - 1. Submit complete shop drawings of each curb type and size for Architect's approval.
- 1.05 QUALITY ASSURANCE:
  - A. Unless otherwise indicated, concrete curb materials and construction shall conform to the applicable portions of MHD's Standard Specifications Section 500, "Curb and Edging."
- 1.06 DELIVERY, STORAGE, AND HANDLING:
  - A. Curb units shall be delivered to the job adequately protected from damage during transit.
  - B. Curb shall be protected against staining, chipping, and other damage. Cracked, badly chipped, or stained units will be rejected and shall not be employed in the work.

## PART 2 - PRODUCTS

#### 2.01 PRECAST CONCRETE CURBS:

- A. Manufacturers: Subject to compliance with the requirements specified herein, manufacturers offering products which may be incorporated in the work include, but are not limited to, the following:
  - 1. Field Concrete Pipe, Wauregan CT.
  - 2. Durastone Company, Lincoln RI.
  - 3. Precast Specialties Corporation, Braintree MA.
  - 4. Or Approved Equal.
- B. Concrete mix for curbs shall meet the following criteria:
  - 1. Portland Cement, type I or III conforming to Standard Specifications, Section M4.
  - 2. Maximum aggregate size: 3/4 inch.
  - 3. Air entrainment: Greater than 3 percent by volume and less than 6 percent.
  - 4. Water reducing agent as recommended by fabricator.
  - 5. Minimum compressive strength (28 day strength): 5000 pounds per square inch.
- C. Forms used for casting curbs shall be steel or wood having a 'smooth- form' surface.
- D. Cast curbs in fabricators standard lengths, but not less than 3 feet. Curved curbing shall be employed on a radii up to 150 feet. Curb units shall be true to line, plane, and dimensions.
- E. Provide custom sized and dimensioned units matching profiles indicated on the Drawings.
- F. Finish shall be uniform, smooth texture, free from cracks and other defects. Color of units shall be uniform. Provide a smooth, light sandblasted finish, on all exposed-to-view surfaces as installed, with the surface texture resembling limestone.

## 2.02 GRANITE CURB- VERTICAL:

- A. Granite for vertical curb, radius curb, corners, curb inlet and transition curb shall be engineering grade structural granite conforming to ASTM C615 requirements. Sizing of curb and comers shall be as shown on the Drawings. Granite curb shall be Type VA-4 as per the "Standard Specification."
- B. Granite shall be of smooth splitting character and free from seams which impair its structural integrity. Natural variations characteristic of the deposit will be permitted. Granite shall come from an approved quarry.

- C. Cement mortar shall meet requirements of Section M4, Paragraph M4.02.15 of the Standard Specifications. Color shall be "natural" to match color of curb.
- D. Concrete shall be 4,000 psi concrete as specified under Section 03300 CONCRETE, herein.
- E. Processed gravel fill as specified under Section 02355 GRAVEL BORROW, herein.

## PART 3 - EXECUTION

- 3.01 INSTALLATION CONCRETE CURBS:
  - A. Trench an area to 18 inches wide and 6 inches below bottom of installed curb. Place aggregate fill and compact as defined in Section 02350 to a compacted thickness 6 inches.
  - B. Curb shall be set in a concrete cradle, level with elevation required and alignment. Vertical face of curb shall be plumb. Butt ends of curbs, with a maximum joint of 1/8 inch. Mortar all joints.
  - C. Do not field cut units without obtaining prior permission from the Architect.
  - D. Expansion joints:
    - 1. Expansion joints shall be 1/2 inch wide, provided with preformed joint filler.
    - 2. Provide expansions joints every 30 feet on center.
    - 3. Provide expansion joints where pre-cast curbing meets cast-in-place curbs, granite curb, handicap ramps, and existing concrete.
  - E. Backfill with aggregate fill, with no stones larger than 1-1/2 inches. Backfill against curbs with taking care to maintain alignment and position. Curbs sections disturbed during backfilling or otherwise shall be reset to line and grade and properly backfilled.

#### 3.02 GRANITE CURBS:

- A. Furnish and install new granite curb and reset existing granite curb removed and stockpiled for reuse, herein. Curb shall be set straight, plumb and as shown on the Drawings.
- B. Curb shall be set in a concrete cradle in a trench excavated to a width of twenty-four inches (24"). The subgrade of the trench shall be at a depth below proposed finish grade of the curb equal to six inches (6") plus the depth of the curb stone. Base course shall then be filled with processed gravel fill to proper level to support curb at final grade and thoroughly tamped.
- C. Place curb units in accurate line, each piece butting the next with joint spacing no larger than one-quarter inch (1/4). Final points shall be joined by closure pieces made to order. No curb shall be cut in the field. After alignment, the curb shall be

carefully backfilled as shown on the Drawings. Extreme care shall be taken not to disturb alignment.

D. Patch street pavement as required.

## INFIELD MIX

## PART 1 - GENERAL

## 1.01 SCOPE OF WORK:

- A. The Contractor shall furnish and construct infield mix surfaces to the lines and grades shown on the plans as specified in this Section, including the provision of all materials, labor, tools, equipment and transportation necessary to complete the work.
- B. In advance of installing the new infield mix surfacing, the Contractor shall be responsible for removal of existing infield materials. Excavated infield materials <u>may not</u> be reused or mixed with the existing subgrade materials.

## 1.02 SUBMITTALS:

- A. Two (2) weeks prior to ordering the material, the Contractor shall submit to the Engineer, at the Contractor's expense, a representative sample of the material to be used, and a copy of a soils analysis from an accredited laboratory classifying the mixture and tabulating the sieve analysis.
- B. If the mixture is disapproved by the Engineer, the Contractor shall continue to obtain other sources of material and have them tested, at his own cost, until the Engineer approves the mixture to be utilized for the clay infield.

## 1.03 RELATED WORK:

- A. Section 01330, SUBMITTALS
- B. Section 02300, EARTHWORK

## PART 2 – PRODUCTS

## 2.01 INFIELD MIX:

- A. The clay infield mixture shall be DuraEdge Classic by DuraEdge Products Inc., Grove City, PA, or an approved equal product.
- B. Infield mix shall contain 70-75% sand.
- C. The infield mix shall be top dressed and blended after it has been graded and rolled. The top dressed product shall be DuraEdge Pro-Slide Professional Red as manufactured by DuraEdge Products or Turface Pro-league Red as manufactured

D. The infield mix shall meet the following:

Sand Sieve Analysis		
Hydrometer Results		
Sand =	72%	
Silt =	12%	
Clay=	16%	

- Infield mix shall be clean, dry clay mixed with washed mason-type sand resulting in a weed-free mixture that is reddish brown in color having a yield of 1.35 tons per cubic yard when placed loose or 1.5 tons per cubic yard when compacted 85%-90% on a Standard Proctor Test (ASTM D 689-07) and meet all the performance and execution specifications of DuraEdge Classic Infield Mix.
- E. Pitching mound and batter's box surfaces shall be DuraPitch Premium as manufactured by DuraEdge Products or HILLTOPPER Mound Clay as manufactured by Read Custom Soils, Canton, MA or approved equal.
- F. Provide and install field bricks as shown on the Drawings. Field Bricks shall be DuraEdge Mound Bricks as manufactured by DuraEdge Products or Mar-Co Field Bricks by Mar-Co Clay Products of Bright, Ontario, Canada or approved equal. Bricks shall be comprised of condensed clay material and be 4"x8"x2.5" in size.

# PART 3 - EXECUTION

- 3.01 INSTALL, ROLL AND COMPACT INFIELD MIX:
  - A. Upon removal of existing surfaces the Contractor shall install, roll and compact the infield mix specified to a compacted finished depth of four (4) inches. Complete installation of clay infield surfaces in conformance with the manufacturer's recommendations or as otherwise required by the Engineer.
  - B. The edges of the infield mix shall meet the grades of adjacent turf areas and stonedust warning tracks. No ridges or depressions will be permitted at edges. Compaction factor is approximately 10%-15% per 1" of material.
  - C. HILLTOPPER (or approved equal)
    - 1. Pitching Area
      - a. Set pitching rubber
      - a. Excavate to a 4-5-inch depth in a 3' wide x 10' long area, measuring one foot

behind the rubber and 9-feet in front of the rubber.

- b. Install Field Bricks as indicated in Drawings.
- c. Apply specified product, or approved equal, and cover with specified infield mix. (approximate amount needed is 35/50 lb. bags)
- d. Fill in back and sides sloping to the edge of the circle, and topdress with approved infield mix.
- 2. Homeplate Area
  - a. Set homeplate with field bricks and square it with the pitching rubber.
  - b. Excavate an 8' wide x 13' long area at a 4-5 inch depth
  - c. Lightly moisten area if soil is dry
  - d. Install Field Bricks as indicated in Drawings
  - e. Place specified product, or approved equal in excavated areas in 1 <sup>1</sup>/<sub>2</sub>" to 2inch lifts. Tamp to compact and firm. Repeat as necessary to meet finish grades. (approximate amount needed is 45/50 lb. bags)
  - f. Cover area with approved infield mix.

# 3.02 COMPLETION:

A. Upon completion, the Contractor shall monitor, until final completion, the constructed infield to assure no migration between the proposed infield mix and surrounding topsoil. In any instance where topsoil migrated into the infield basepaths, the Contractor must screen infield and remove topsoil.

END OF SECTION

### SECTION 02791

### WARNING TRACK SURFACING

### PART 1 - GENERAL

### 1.01 SCOPE OF WORK

A. The work to be done under this Section shall be the furnishing, placement and compaction of warning track surfacing as shown on the drawings and as specified herein. The Contractor shall be responsible for supplying the material, labor, equipment and transportation necessary to do the work.

#### 1.02 SAMPLES

- Prior to ordering and delivering materials to the site, (1) representative samples of warning track surfacing shall be sent to the Owner's Representative for approval. The material shall be analyzed by a certified testing laboratory and certified by the supplier as a byproduct of a stone quarry operation.
- B. The color shall be medium to dark reddish brown when wet and consistent throughout.Samples must match that product which is to be installed.

### 1.03 RELATED WORK:

- A. Section 01330, SUBMITTALS
- B. Section 02300, EARTHWORK

### PART 2 - MATERIALS

### 2.01 WARNING TRACK SURFACING

- A. Warning track shall be the product of a stone crusher and shall consist of inert materials that are hard, durable stone, free from surface coatings and deleterious materials.
- B. The warning track surface mixture shall be New England Crimson Duratrax by DuraEdge Products Inc., Grove City, PA, or an approved equal product.
- C. Gradation requirements shall be as follows:

U.S. Sieve No. Percent Passing by Weight

#	4	100
#	8	96
#	16	68
#	30	43
#	50	29
#	100	17
#	200	11

### PART 3 - EXECUTION

- 3.01 The warning track surface shall be placed over a previously approved and installed compacted base of gravel as detailed and as specified under Section 02300 of these Specifications.
- 3.02 The stone warning track surface material shall be placed to the line and grades shown on the plans and shall consist of a minimum of the detailed thickness after watering and compacting to ninety-five percent (95%) of the maximum dry density of the material as determined by the Standard AASHO Test Designation T99 compaction test Method C at optimum moisture content as determined by the Landscape Architect.
- 3.03 Compaction shall continue until the surface is even and true to the proposed lines and grades within a tolerance of three-eighths (3/8) inch above or below the required cross-sectional elevations and to a maximum irregularity not exceeding three-eighths (3/8) inch under a ten (10) foot line longitudinally. Any specific area of material sub-base which, after being rolled, does not form a satisfactory, solid, stable foundation shall be removed, replaced and recompacted by the Contractor without extra compensation.
- 3.04 Upon completion, the Contractor shall monitor, until final completion, the constructed infield to assure no migration between the proposed infield mix and surrounding topsoil. In any instance where topsoil migrated into the infield basepaths, the Contractor must screen infield and remove topsoil.

# END OF SECTION

# **SECTION 02800**

# SITE IMPROVEMENTS

# PART 1 - GENERAL

#### 1.01 REFERENCES

- A. All of the Contract Documents, including the General and Supplementary Conditions and Division 0 - Bidding Documents, Contract Forms, and Conditions of the Contract and Division 1 – General Requirements, apply to the work of this Section.
- B. Carefully examine all the Contract Documents for requirements which affect the work of this Section. The exact scope of this Section cannot be determined without a thorough review of all specification sections and other Contract Documents.
- C. **ASTM Testing Standards**:
  - ASTM B 117 Standard Practice for Operating Salt Spray (Fog) Apparatus. 1.
  - ASTM D 522 Standard Test Methods for Mandrel Bend Test of Attached 2. Organic Coatings.
  - 3.
  - ASTM D 523 Standard Test Method for Specular Gloss. ASTM D 2247 Standard Practice for Testing Water Resistance of Coatings in 4. 100% Relative Humidity.
  - 5. 5ASTM D 2794 – Standard Test Method for Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact).
  - ASTM D 3359 Standard Test Methods for Measuring Adhesion by Tape Test. 6.
  - ASTM D 3363 Standard Test Method for Film Hardness by Pencil Test. 7.
  - ASTM G 155 Standard Practice for Operating Xenon Arc Light Apparatus for 8. Exposure of Non-Metallic Materials.
- D. **ISO Testing Standards:** 
  - ISO 1520 Paints and Varnishes Cupping Test. 1.
  - ISO 2815 Paints and Varnishes Buchholz Indentation Test. 2.
- E. **ANSI/BIFMA** Testing Standards:
  - ANSI/BIFMA X5.4-2005 Standard Test for Lounge Seating. 1.
- 1.02 **SCOPE** 
  - The work of this Section consists of all Site Improvements work and related items as A. indicated on the Drawings and/or specified herein and includes, but is not limited to, the following:
    - 1. **Picnic Tables**
    - Benches 2.
    - 3. Café Tables
    - Shade Shelters 4.
    - **Bike Racks** 5.
    - Interpretive Signage 6.

- 7. Storage Shed
- 8. Park Signage
- 9. Porous Flexible Paving
- 10. Flag Poles

### 1.03 SUBMITTALS

A. Shop Drawings/Product Literature: Include plans, sections and details as required to show all materials, layout, dimensions, jointing and connections for all items required.

Prior to ordering the above listed materials, submit shop drawings and fabrication details or product literature to Landscape Architect for approval as follows. Do not order materials until Landscape Architect's approval has been obtained. Delivered materials shall closely match the approved samples.

### 1.04 EXAMINATION OF EXISTING CONDITIONS

- A. The Contractor shall fully inform himself of existing conditions of the site before submitting his bid, and shall be fully responsible for carrying out all work required to fully and properly execute the work of the Contract, regardless of the conditions encountered in the actual work. No claim for extra compensation or extension of time will be allowed on account of actual conditions inconsistent with those assumed, except those conditions described under the GENERAL CONDITIONS.
- B. All areas shall be inspected by the Contractor before starting work and any defects, such as incorrect grading, drainage problems etc., shall be reported to the Landscape Architect prior to beginning the work. The commencement of work by the Contractor shall indicate the Contractor's acceptance of the areas to be hydroseeded, and the Contractor shall assume full responsibility for the work of this Section.
- C. The Contractor shall be solely responsible for judging the full extent of work requirements involved, including but not limited to the potential need for storing materials temporarily and/or rehandling items prior to final installation.
- D. Contractor shall verify all utility conditions and elevations prior to work. Before construction starts, all utility companies, public and private, must be contacted, including those in control of utilities not shown on this plan. See Chapter 370 Acts of 1963 Massachusetts and contact -DIG SAFE: 1-800-DIG-SAFE-. Report any discrepancies in writing to the Landscape Architect and the Owner and receive written instructions prior to proceeding.

### 1.05 MANNER OF CONDUCTING THE WORK

- A. The work shall be conducted with prime consideration given to the following:
  - 1. Compliance with UFAS requirements.
  - 2. Compliance with governing laws and building codes.
  - 3. Safety, protection, and convenience of the public and workmen.
  - 4. Protection of the existing building structure, materials and finishes to remain from damage.
  - 5. Minimization of dirt and dust proliferation.
  - 6. Avoidance of any damage to existing vegetation to remain.

- B. All work shall be done in accordance with the governing laws and building codes and all necessary permits required for the Site Improvement work shall be procured by the Contractor. Provide unobstructed legal exits at all times.
- C. Workmanship and finish shall be equal to the best practice of modern shops for each item of work. Exposed surfaces shall have a smooth finish and sharp, well-defined lines and arises. Sections shall be well formed to shape and size with sharp lines and angles; curved work shall be spring evenly to curves. Welding shall be done in accordance with the Structural Welding Code of the American Welding Society. All welding, except as otherwise noted, shall extend the entire length of the joints. All welded face joints shall be ground flush and smooth.
- D. Where provisions must be made for attaching other materials to work included under this Section or where provisions must be made for assembly and installation for steel and metal fabrications in the field, the required holes shall be provided in the shop, unless such connections are to be welded. The sizes and locations of all such holes shall be shown on the Shop Drawings. Such holes shall be either drilled or punched and reamed.

### 1.06 DELIVERY, HANDLING AND STORAGE

- A. Deliver materials in original sealed containers marked with name of manufacturer and identification of contents. Store materials under waterproof covers on planking clear of ground and protect from handling damage, dirt, stain, water and wind.
- B. Take all necessary precautions to prevent all items from damage during transportation of these materials to the project, unloading and storage on site. Damaged items will not be allowed to be installed and should any damaged items by found in erected work, such items shall be removed immediately and replaced with new items, and the Contractor shall assume all expenses incurred there from.
- C. Stored materials shall be adequately protected against moisture by (1) staking in such a manner as to allow a complete circulation of air under each stack, and (2) covering each stack, top and sides with a waterproof paper or membrane. Coverings shall remain in place at all times, when not working from the particular stack.
- D. Deliver bolts and other small items required for erection of work under this Section bundled with their respective items.

### PART 2 - PRODUCTS

### 2.01 MATERIAL REQUIREMENTS

- A. Provide only new materials, free from defects impairing strength, durability or appearance and of the quality specified.
- B. Standard products meeting the detailed requirements specified herein will be considered for approval by the Landscape Architect.
- C. Furnish all supplemental parts necessary to complete each item whether or not such parts are shown or specified. Furnish all fastenings for securing work required hereunder.
- D. Provide fastenings of the same material, color and finish as the metal to which applied unless otherwise indicated.
- E. Picnic Tables, Café Tables, and Benches shall be supplied by the same manufacturer.

# 2.02 PICNIC TABLES

- A. Scope includes all labor, materials, and equipment and incidental items, necessary to provide and install new picnic tables in locations to be determined in field by owner's representative.
- B. Total number of picnic tables will be per construction drawings. Location of picnic tables shall be determined in field. <u>NOTE</u>: all picnic tables shall be wheelchair accessible and shall have a concrete pad surface with an extra 6' x 3' area adjacent to path for wheelchair access.
- B. Concrete base as specified in Section 03300.
- C. Gravel fill as specified in Section 02300.
- D. The picnic tables shall be 299-60-1HS by DuMor Site Furnishings, Inc. Equivalent model by Landscape Forms, Inc. or Custom Fabrication, Inc of Harpursville, New York 13787, or approved equal.
- B. Color shall be Black, Mounting shall be: surface mounted.

# 2.03 BENCHES

- A. The benches shall be 160-60-3AR by Dumor Site Furnishings, or equivalent model by Landscape Forms Inc, or, Custom Fabrication, Inc, or approved equal.
- B. Color shall be Black, Mounting shall be: surface mounted
- 2.04 CAFÉ TABLES
  - A. Café tables shall be 297-42-30HS by Dumor Site Furnishings, or equivalent model by Landscape Forms Inc, or, Custom Fabrication, Inc, or approved equal.
  - B. Color shall be Black, Mounting shall be: surface mounted. Final locations to be determined in the field by owner's representative.

### 2.05 SHADE SHELTERS

- A. Shade Shelter shall be custom designed by Apollo Sunguard, 4487 A Ashton Road, Sarasota FL 34233. Or approved equal. Shade shelters shall be Kite style post and sail and or T-style structures. Structures to match the project drawings.
- B. Contractor shall submit Manufacturer's drawings, calculations and details for the shelters and footings, <u>stamped by a structural engineer registered in the Commonwealth of Massachusetts.</u>
- C. Design members to withstand wind loads in accordance with current version of ASCE-7, International Building Code (IBC), and applicable local, state, county, and city codes.

- D. Design structures for winds up to 180 mph with the cover off and 105 mph with the cover on.
- E. Design foundations in accordance with ACI and applicable code and good construction practices for the specific structure and site conditions.
- F. Cooperate with regulatory agency or authority and provide data as requested authority having jurisdiction.
- G. Design covers for easy removal and replacement.
- H. Design covers for a maximum 5 lbs. snow load.
- I. Design covers for a maximum 5 lbs. live load as per awnings and canopies.
- J. FRAMING MATERIALS
  - a. American Institute of Steel Construction (AISC) or American Iron and Steel Institute (AISI) specifications.
  - b. Conduit tubing conforming to ASTM A500, galvanized.
  - c. Structural Steel Cold formed HSS ASTM 500 GRADE C unless otherwise noted.
  - d. Structural Steel Pipe: A53 Schedule 40.
  - e. Structural Steel Members: Steel Plates ASTM A36, A50 or A572.
  - f. ASTM A-123 Standard Specifications for Zinc (Hot-Dipped Galvanized) Coatings on Iron and Steel Products.
  - g. Bolts, Nuts, and Washers: ASTM A325 Galvanized and A316 stainless steel. All Stainless Steel bolts shall comply with ASTM F-593, Alloy Group 1 or 2. All nuts shall comply with ASTM F-594 Alloy Group 1 or 2.
- K. REINFORCED CONCRETE
  - a. Concrete work shall be executed in accordance with the latest edition of the American Concrete Institute Building Code. Concrete specifications shall meet all specifications included in the project
- L. FABRICATION
  - a. Steel Components: Fabrication of steel components shall be in accordance with guidelines set forth in the AISC steel design manual and the AWS code of structural welding.
  - b. Welds: All shop welds shall be executed in accordance with the latest edition of the American Welding Society (AWS) D1.1 specifications. All welds shall be continuous where length is not given. All welds shall develop the full strength of the weaker member. All welds shall be made using E70XX Low Hydrogen. i. All welds shall be in accordance with manufacturers design and performed prior to shipping. No welding shall be performed in the field. ii. Grind all corners and sharp edges. iii. Steel will require abrasive blasting and primer before application of the polyester powder paint finish.
- M. Powder Coating: All steel shall be painted with one shop coat polyester powder

painted to a minimum thickness of 3.5 - 4 mils.

- a. Pencil hardness (ASTM D-3363)
- b. Humidity (ASTM D-2247)
- c. Solvent Resistance (PCI Test Method)
- N. Frame Colors: Colors as selected from the manufacturer's standard selections.
- O. Manufacturer's warranty shall include a 20-year non-prorated warranty for all steel frame work against all structural failure due to corrosion, deterioration, or workmanship, a limited 15-year non-prorated warranty for all polyethylene covers against deterioration, rot, or faulty workmanship including seam failure.
- P. SHADE FABRIC MATERIALS shall be:
  - a. High density polyethylene fabric with ultraviolet blocking additives.
  - b. Fabric is knitted providing stability and fraying resistance when cut. Fabric is fabricated with monofilament and tape construction for additional stability.
  - c. Have a Fabric Mass: 340 gsm ii. Tear Strength a. Warp 635 N/50mm b. Weft 2494 N/50mm c. Bursting Pressure 3500 kPa d. Bursting Force 2146 N E.
  - d. Fabric Corners & Hemmed Edges: Fabric cover fabricated with PTFE coated UV resistant thread.
  - e. Fabric connection points & cable exit points to be triple reinforced and heat sealed with vinyl interfacing inserted and sewn between layers of reinforcement.
  - f. Fabric shall be pre-stressed prior to fabrication.
    - i. W. L. Gore Tenara
    - ii. Solar Fix I. Fire Rating:
      - 1. ASTM E 84: Class 1, Flame Spread 15, Smoke Developed 15
      - 2. NFPA 701 Test Method 2 test
      - 3. FFPC Florida Fire Prevention Code
      - 4. Specific fabric type meets California State Fire Marshall Requirements, Section 13115 of California Health & Safety Code. Limited fabrics available. Inquire for available selection.
  - g. Shade Percentage: 60 percent to 95 percent (varies by fabric color).
  - h. UVB Block: 83 percent to 96 percent (varies by fabric color).
  - i. Colors: Color as selected from the manufacturer's standard selections.

# Q. CABLE FASTENING AND TENSIONING MATERIALS

- a. Fastening and Tensioning System: Quick & Easy Turnbuckle Tensioning System on all cantilever style system shade.
- b. quick release system to remove the fabric covers easily. No special tools are to be required.
- c. Turnbuckles: Premium Closed Body & open body
- d. Wire Rope shall conform to AISI Steel Cable Manual requirements with a Class A galvanized coating or approved substitute. ASTM A603. Cable shall be IWRC improved plow steel. Aircraft Grade 7x19 core wire rope.
- e. Normal diameters used : Ø1/4", Ø3/16", Ø3/8" & Ø5/16" Ø 1/2" iv. Construction: 7X19 v. Surface: galvanized vi. Core: JWS vii. Stainless steel when specified.

R. Colors to be determined through shop drawing process.

# 2.06 BIKE RACK

- A. The bike racks shall be "292-s2" by Dumor Site Furnishings or approved equal.
- B. Color shall be Black, Mounting shall be: Surface

# 2.07 INTERPRETIVE SIGNAGE

- A. Contractor shall supply and install (2) Carved and painted signfoam using 1"x 1" painted square tube frame welded to match plate and bolted to 6" x 6" granite posts. Signs shall match detail drawings. Signs to be manufactured by Sunshine Sign, 508-839-5588, or approved equal.
- B. Contractor shall supply and install two (2) 3-faced kiosk constructed of aluminum tube frame, painted.
  - a. One side of Kiosk houses a pre-constructed 2" deep manual message center, with extruded aluminum frame and door.
  - b. Unit is welded into kiosk frame structure.
  - c. Middle and right side are sheeted with aluminum and have full vinyl prints back with ACM and attached to faces with insets.
- C. Contractor shall supply and install five (5) 8.5" x 11" Zinc plaque mounted to 6" x 6" aluminum post, on a 45-degree angle. Signs shall be set I a concrete footing ad buried a minimum of 36" below grade.
  - a. Zinc plaque has raised white text and border with duranodic background.
- D. Contractor shall supply and install one (1) Community gardens kiosk. Kiosk shall be constructed of aluminum tube frame, painted. Kiosk houses a pre-constructed 2" deep manual message center, with extruded aluminum frame and door. Unit is welded into kiosk frame structure.
- E. Contractor shall supply and install five (5) Park rules signs. Signs shall be <sup>1</sup>/<sub>4</sub>" thick aluminum panel with applied vinyl graphics welded to a 2" by 2" aluminum tube frame and direct buried into concrete below grade 36" min.
- F. Owner shall supply all signage graphics in digital format as required by manufacturer to Contractor during construction.
- G. Contractor shall supply mock-ups and digital representations of all signage for review and approval prior to manufacture.

# 2.08 STORAGE SHED

A. There is to be one storage shed purchased and installed on a concrete pad. The shed shall Be the 10 x 10 "Gable shed" manufactured by Jamaica Cottage Shop 866-297-3760 or approved equal and will be made of hemlock with 4x4 post and beam wall framing, double pine doors with a pressure treated ramp. Shed shall have a gabled standing seam metal roof. Siding shall be 1" rough sawn pine board and batten siding with rough sawn pine trim. Color as selected by Owner's Representative.

# 2.16 POROUS FLEXIBLE PAVING

- A. Product shall be manufactured with 100% high density recycled polyethylene, interlocking units. Empty unit compressive strength min. 175 PSI. Aggregate filled unit compressive strength min.1000 PSI.
- B. Shall be one of the following systems: Bodpave 85 by Boddingtons Inc 1-651-330-2920, Urban Green Plastic Paving System by Contech Construction Products Inc. 1-800-338-1122 or Turf Pave XD available from Reed & Graham 1-888-381-0800, or approved equal.
- C. Root zone material and bedding layer shall be a sandy loam. Refer to section 02930 TREES, SHRUBS, GROUNDCOVER, AND LANDSCAPING.
- D. Installation per manufacturer's recommendation and as indicated on Drawings.
  - F. For Seeding, Mulch, Fertilizer requirements see section 02930 TREES, SHRUBS, GROUNDCOVER, AND LANDSCAPING

# 2.17 FLAG POLES

- A. Submit complete and detailed shop drawings indicating entire flagpole, installation, foundation and all accessories.
- B. Flagpole shall be one of the following or Architect approved equal:
  - a. Model No IWW30D61-AE (2) AND IWW35D61-AE (1) as manufactured by American Flagpole Co. 3546 Lake Elmo Ave., Suite 3, Lake Elmo MN 55042 (<u>info@aflag.com</u>) Model # IW306156 and # IW357188 by The Flagpole Co. P.O. Box 765 Brooklyn MI 49230 (<u>Sales@TheFlagpoleCo.com</u>)
  - b. Model EC30IH and EC35IH by American Flagpoles and Flags, 2183 Highway 17 North Suite 110 Mount Pleasant, SC 29466 or approved equal.
- C. Finish to be dark bronze anodized finish. Color to be impregnated permanently in pole. Internal Halyard with stainless steel cable.
- D. Flash Collar: Provide and install decorative spun aluminum collar and ground sleeve as required for height of pole specified.
- E. Lightning Protection: 3/4 inch diameter steel lightning protector ground spike welded to base plate and to support plate.
- F. Shim blocks shall be pressure treated hardwood wedges at top of foundation tube to adjust pole and maintain true vertical position.

# PART 3 - EXECUTION

#### 3.01 PICNIC TABLES

- A. Locate and install picnic tables, complete in place, as shown on the Drawings and in accordance with approved Shop Drawings.
- B. Picnic tables shall be set vertically plumb, true to line and grade, and **shall be** anchored in cement concrete footings. Picnic tables shall be assembled in accordance with approved Shop Drawings and per manufacturer's specifications.
- C. The color system specified is a factory applied finish coating. Upon arrival on the job site it is the Contractor's responsibility to handle the picnic table in such a manner as to minimize damage to the finish. Should any damage occur to the coating surface in shipping or handling at the job site, it is the responsibility of the Contractor to touch up said damage to color system using suitable touch-up materials, either liquid or aerosols, available from the manufacturer. Dry film thickness of applied repair paint to be not less than what was originally specified herein.

### 3.03 SHADE SHELTER

- A. Locate and install shade shelter, complete in place, as shown on the Drawings and in accordance with approved Shop Drawings.
- B. Shade shelter shall be set vertically plumb, true to line and grade. Shade shelter shall be assembled in accordance with approved Shop Drawings and per manufacturer's specifications.

### 3.04 TRASH RECEPTACLE AND BENCHES

- A. Install trash receptacles, benches, in accordance with drawings and the manufacturer's instructions.
- B. The Contractor shall be responsible for timing the delivery of trash receptacles and benches so as to minimize on-site storage time prior to installation. All stored materials must be protected from weather, careless handling and vandalism.

### 3.05 BIKE RACK

- A. Install Bike Rack in accordance with drawings and the manufacturer's instructions.
- B. The Contractor shall be responsible for timing the delivery of bike racks so as to minimize on-site storage time prior to installation. All stored materials must be protected from weather, careless handling and vandalism.

# 3.06 INSTALLATION OF FLAGPOLES

A. The installer shall examine previous work, related work, and conditions under which this work is to be performed and notify the Contractor in writing of all deficiencies and

conditions detrimental to the proper completion of this work. Beginning work means installer accepts substrates, subgrades, previous work, and conditions.

- B. Install flagpoles in accordance with the Drawings and the manufacturer's instructions and recommendations.
- C. The Contractor shall be responsible for timing the delivery of flagpoles so as to minimize on-site storage time prior to installation. All stored materials must be protected from weather, careless handling and vandalism

END OF SECTION

# **SECTION 02801**

# SITE IMPROVEMENTS-SPORTS EQUIPMENT

# PART 1 - GENERAL

- 1.01 RELATED DOCUMENTS: Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
- 1.02 WORK INCLUDED:
  - A. Provide site improvements in the locations shown or as described herein, complete with anchorages and associated site work.
- 1.03 RELATED SECTIONS:

Division 2 Section "Earthwork" for excavation and grading related to site improvements. Division 3 Section "Cast-In-Place Concrete" for anchorages.

- 1.04 SUBMITTALS:
  - A. Contractor shall submit catalog information on site improvements for review by Architect.
- 1.02 SCOPE
  - A. The work of this Section consists of all Sports Equipment Site Improvements work and related items as indicated on the Drawings and/or specified herein and includes, but is not limited to, the following:
    - 1. Home Plate
    - 2. Bases
    - 3. Pitcher's Rubber
    - 4. Tennis Posts and Nets
    - 5. Aluminum Players Benches
    - 6. Foul Poles
    - 7. Basketball Posts, Backboards, Goals, and Nets
    - 8. Corrugated Fence Caps
    - 9. Bleachers
    - 10. Multi-Sport Court Backboard

# PART 2 - PRODUCTS

- 2.01 SPORTS EQUIPMENT:
  - A. HOME PLATE:
    - 1. Model No. SHP-PS/Pro Home Plate, with ground anchor as manufactured by Schutt 02801 1

Sports, or

- 2. Model HP-200 major league home plate manufactured by Jaypro Sports, or
- 3. Model 8501-00 professional style home plate as manufactured by Patterson-Williams Athletic MFG. Co., or
- 4. An approved equivalent. All systems to be provided with approved anchoring. All components are to meet NFHS Standards and to be approved by the Engineer.
- B. BASES:
  - 1. Bases shall be Hollywood Impact Bases Model No. HIBL/ Hollywood Impact Bases, set of 3 bases with BBP-44 ground anchor mounts and BBP-1 Anchor plug with indicator as manufactured by Schutt Sports, or
  - 2. Model BB-500 Pro- style Hollywood bases manufactured by Jaypro Sports, or
  - 3. Model 8503-00 heavy duty white rubber bases as manufactured by Patterson-Williams Athletic MFG. Co., or
  - 4. An approved equivalent. All systems to be provided with approved anchoring. All components are to meet NFHS Standards and to be approved by the Engineer.

# C. PITCHERS RUBBER:

- 1. Model No. SPR-4SO/ Official size pitchers rubber as manufactured by Schutt Sports, or
- 2. Model PR-624 Professional pitching rubber manufactured by Jaypro Sports, or
- 3. Model 8510-00 4-way pitching rubber as manufactured by Patterson- Williams Athletic MFG. Co., or
- 4. An approved equivalent. All systems to be provided with approved anchoring. All components are to meet NFHS Standards and to be approved by the Engineer.

# D. TENNIS NETS AND POSTS

- 1. Provide and install one pair of tennis net posts for each new tennis court in accordance with the Details indicated on the Drawings. Care shall be taken to preserve the integrity of the asphalt concrete paving and underlying soils while excavating and installing concrete footings. Concrete footings must conform to the size and shape indicated on the Detail, or the Contractor will be required to remove and replace the footings at his expense.
- 2. Tennis posts shall be one of the following or Landscape Architect approved equal:
  - a. Model No 3002, "Edwards Wimbledon Tennis Post" & Model No. 2001 #30 LS "Edwards Tennis Net, as manufactured by Edwards Sports Products, England and available through N.J.P. Sports, 548 W. Arden Ave., Glendale, CA 91203, (800) 773-4657.
  - b. Model # 63032BR, Premier XS as manufactured by douglas, 3441 S 11th Ave., Eldridge, IA 52748. 1-800-553-8907

- c. Model # A67-010, "Royal Square Tennis Posts" and Model # A67-120. "JA Cissel 711CI Deluxe Tapered Tennis Net" as supplied by Anthem Sports, 1-800-688-6709.
- 3. Posts shall be constructed of 3" OD, heavy wall steel tubing and factory finished with black, baked on polyester powder coating. Winder handle shall be a brass or bronze and removable. Ground sleeves shall be aluminum.
- 4. Nets shall be constructed of 3 mm braided black polyethylene netting quadruplestitched heavy-duty polyester web headband with a 3/16 inch dia. vinyl coated steel cable. At least top five rows shall be double mesh. Bottom edge shall be synthetictaped. Side pockets shall be grommeted with dowel.
- 5. Tennis nets shall be as manufactured by the Gold Medal Recreation Products Company and represented by M.E. O'Brien and Sons, Medfield, Massachusetts, Model No. 62-18-0039, or approved equal.
- 6. Provide and install net center strap and tie down anchors in concrete foundation in accordance with the detail. Coordinate elevations with paving work.

# E. ALUMINUM METAL PLAYERS' BENCHES

1. Players' benches shall be 15' long, with back, suitable for permanent in-ground installation Model Number B15WBRCSM-POLY, <sup>3</sup>/<sub>4</sub>" #9 Expanded Metal, Rounded Corners, Two Sections Bolted together, Four 2 3/8" Legs Surface Mount. Stickers: webcoat, poly color: Mystic Blue, frame powder coat color: red

As manufactured by Superior Recreation Products, 1050 Columbia Dr. Corrollton, GA 30117, 800-327-8774.

2. Furnish with the anchoring option for direct embedment into concrete base or pad.

# F. FOUL POLES

 Foul pole shall be flagged mesh foul poles as indicated in the photo below, such as Model # BBFP-20 as manufactured by Jaypro Sports, Incorporated of Waterford, CT; Model number 1273 and 1274 as manufactured by P.W. Athletic Mfg. Co. 140 N. Gilbert Road, MESA, AZ 85203 or approved equal.



2. The foul pole shall be:

20' height for baseball finished above ground, telescoping type post with  $3-\frac{1}{2}$  inch outside diameter at the base.

- 3. Finishing, including priming and powder coating shall be consistent with the manufacturer's specifications for the particular model.
- G. BASKETBALL POSTS, BACKBOARDS, GOALS, AND NETS
  - 1. Provide detailed shop drawings that include the manufacturer's specifications and recommended installation prior to ordering materials.
  - 2. Furnish and install complete basketball goals in accordance to the Drawings and the manufacturer's recommended installation.
  - 3. Basketball posts, backboards, goal and net shall be provided by one of the following or Landscape Architect approved equal.
    - a. True Bounce, Inc. 194 Riverside Ave, New Bedford, MA 02746, 1-888-873-3715, <u>www.truebounce.com</u>
    - Jaypro Sports, LLC., 976 Hartford Tpk, Waterford, CT 06385 800-243-0533.
    - c. Bison, Inc., 603 L Street, Lincoln NE 68508, 800-247-7668
  - 4. Goals posts shall consist of 5-9/16" O.D. schedule 40 steel pipe with a 90 degree bend giving the backboard a 6 foot offset. Post shall be hot dip galvanized per ASTM A123 category 100.
  - 5. Backboard shall be clear, UV resistant, <sup>1</sup>/<sub>2</sub>" thick polycarbonate, tempered glass, or approved material with dimensions 72"x42". Backboard shall be framed with E-channel extruded aluminum and attached with stainless steel hardware. Target shall be silk screened on the face of the backboard with trim. Color to be selected by Owner
  - 6. Rim shall be powder coated, front mount 18" single ring goal with nylon net.

# H. CORRUGATED FENCE CAP

- 1. Provide new corrugated plastic fence capping on all four-foot height baseball fencing.
- 2. Fence Cap shall be one of the following or Landscape Architect approved equal:
  - a. Poly Tube Cap by Signature Fencing and Flooring, LLC 800-569-2751
  - b. Poly Cap Fence Top Protector as manufactured by Anthem Sports, (800) 688-6709
  - c. Fence Crown Fence Guards as supplied by Cover Sports USA, 800-445-6680
- 3. Cap shall be 4-1/2" corrugated polyethylene pipe, safety yellow in color.
- 4. Install along outfield fence and along the 1st and 3rd base lines where fence is 4' height and as indicated on the drawings. Secure with color match zip ties 3' O.C.

# I. BLEACHERS

- 1. Shop drawings:
  - d. Layout of bleacher system to include dimensions, details, and finishes of components, accessories, and post foundations.
  - e. Drawing/s to include engineers stamp certifying the bleacher system is in code compliance with all state regulations and meets manufacturer's structural requirements.
- 2. Product data: Manufacturer's catalog cuts indicating material compliance and specified options.
- 3. Bleacher systems shall be aluminum bleacher system by the following manufacturers or approved equal:
  - a. Model # LU-0321GS from GT Grandstands Inc. 1-866-550-5511 or approved equal.
- 4. Low-Rise 3 Row x 21' non-elevated bleacher, seating for 42 + 4 H.C. seats unit. Front row cut outs.
  - a. All aluminum understructure
  - b. 2 x 10 seat planks anodized
  - c. Double 2 x 10 mill finish foot planks
  - d. 6" riser x 24" treads

5. Securely attach bleacher to concrete slab with galvanized hardware per manufacturer's instructions.

# J. MULTI-SPORT COURT BACKBOARD

- 1. Backboard shall be Kompan Cosmos 9'10" Wide Multigoal FRE2210-3317
- 2. Goal shall be free-standing and incorporate panels and frames for use with basketball, soccer, field hockey, and other court sports.
- 3. Rear barrier shall be made of steel grating connecting to galvanized tube frame.
- 4. Goal sides shall be open.
- 5. Footings shall be direct-buried per manufacturers specifications.

# PART 3 - EXECUTION

- 3.01 Sports Equipment shall be permanently installed in concrete anchorages unless otherwise indicated by manufacturer specifications. See Division 3-Section "Cast in Place Concrete for Bases and Anchorages".
- 3.02 Sports Equipment shall be installed in accordance with Massachusetts State High School Athletic Association Standards, manufacturer's installation instructions, and as shown on the plans.
- 3.03 Any site improvement materials which are constructed of steel and not galvanized or factory coated with a finish system shall be painted in the field in accordance with Division 9 Specification "Painting and Finishes". Colors by Architect.
- 3.04 All Sports Equipment shall be installed ready for use. All nets, cables, uprights, etc., shall be in place. Bleachers and benches shall be placed as required by the Architect.

# CLEANING, REPAIR AND PROTECTION

- A. Repair minor damage to eliminate all evidence of repair. Remove and replace work that cannot be satisfactorily repaired.
- B. Provide temporary protection to ensure that the work will be without dirt, stains, damage or deterioration at time of final acceptance. Clean up stains and spills as they occur. Remove protections and clean as necessary immediately before final acceptance.

C. Upon completion of the work and before acceptance, the Contractor shall remove and dispose of in an approved manner all surplus materials, rubbish, etc. which the Contractor may have accumulated during the course of the work and shall leave the site in a clean and orderly condition. The Contractor shall not abandon any material at or near the site regardless of whether or not it has any value.

# END OF SECTION

# SECTION 02810

# IRRIGATION SYSTEM SPECIFICATIONS

### PART 1- GENERAL

### 1.01 WORK INCLUDED:

This specification is to be used in conjunction with the attached design and detail sheet. Where indicated on the drawings, the contractor is to provide material and installation of a complete, automatically controlled, underground irrigation system including, but not limited to, the following:

Piping, backflow prevention device, sprinkler heads and nozzles, valves, controllers, control wiring, fittings, electrical connections, connections to mains, and all necessary accessories.

#### 1.02 WORKMANSHIP AND QUALIFICATIONS

- A. The work will be done by an experienced, qualified contractor and will be performed in a professional manner in strict compliance with safety requirements prescribed in current standards of state, and local codes.
- B. Bidder/Contractor shall submit evidence of not less than five years experience in providing and installing underground irrigation systems.
- C. Contractor and/or subcontractor must provide at least five (3) references of completed projects of the specified type of system. References must be of similar size and scope of work.

#### 1.03 SUBMITTALS

- A. Shop Drawings: The Irrigation Contractor shall be responsible for providing shop drawing' of recommended irrigation design based on the proposed planting design. Quantity, type and location of all pipes, fittings, valves, etc. shall be indicated based on the specifications herein.
- B. All materials of every description are to be furnished exactly as specified and shall be new and of the best quality and grade obtainable. The Irrigation Contractor, before beginning work herein specified shall submit to the Landscape Architect/Irrigation Designer for approval: Manufacturer's technical product data and installation instructions; and Three (3) sets of material submittals, bound and indexed for all irrigation system materials and products to be furnished. If the Irrigation Contractor requires more than one (1) copy of submittal returned, the

initial submittal shall be increased by the appropriate number. Material submittals shall include, but are not limited to, the following:

# PART 2- PRODUCTS

# 2.01 ACCEPTABLE MANUFACTURERS

- A. Manufacturers
  - 1. Hunter Industries
  - 2. Toro-Riverside, California
  - 3. Rain Bird Corporation

# 2.02 MATERIALS

- A. Irrigation Controller:
  - The controller shall be a Rain Bird IQ ESP LXMEF controller, station modules (enough to cover all zones) and cellular communication cartridge, configuration and programming. The controller shall be placed in the Rain Bird Exterior Metal cabinet. (For questions contact Central Turf and Irrigation Supply (914) 347-5656 Ext. 1027.)
- B. Mainline, Lateral Lines & Sleeving:
  - 1. All mainlines shall be PVC Class 200.
    - a. Mainline 2.5" and larger shall be manufactured with bell ends and gaskets.
    - b. All mainline Class 2" and smaller shall be manufactured with bell ends and will be solvent welded.
    - c. All pipe sizes to be indicated on the drawing.
  - 2. All Laterals shall be PVC Class 200.
    - a. Laterals 1.25" and smaller may be substituted from Class 200 PVC to 100 psi rated Poly pipe.
  - 3. All Sleeving shall be PVC Class 200.
  - 4. All electrical sleeving shall be PVC Schedule 40 Grey Electircal Conduit conforming to ASTM D 2241 and be sized as indicated on the drawings.
- C. Pipe Fittings
  - 1. All mainline fittings 4" and larger shall be Ductile Iron manufactured with Gaskets.

- 2. All mainline fittings from 2.5" to 3" shall be Schedule 40 manufactured with Gaskets.
- 3. All mainline fittings 2" and smaller shall be Schedule 40 solvent weld.
- D. Remote Control Valves:
  - 1. The valves shall be Hunter ICV Series Valves. Reference design for actual part number, or approved equal as accepted by irrigation designer.
  - 2. All remote control valves are to be connected to the mainline by schedule 80 fittings consisting of threaded nipples and threaded elbows. No solvent weld fittings or schedule 40 male adaptors will be allowed.
- E. Sprinkler Heads:
  - 1. Pop-up Spray Heads:
    - a. The sprinklers for all turf areas shall be matched precipitation nozzles; Hunter Pros spray 4-inch heads with matched precipitation nozzles. Reference design for actual part number, or approved equal as accepted by irrigation designer.
  - 2. Pop-up Turf Rotor Heads:
    - b. The sprinkler shall be a Hunter I25 and I20 rotors. Reference design for actual part number, or approved equal as accepted by irrigation designer.
- F. Quick Coupling Valves:
  - 1. Valves:
    - a. The quick coupling valve shall be a one-piece type, constructed of heavy cast brass.
    - b. The cover shall be a durable, protective self-closing rubber cover.
    - c. The quick coupler valve shall be a Hunter HQ-44RC 1" Quick Coupling Valve; Rainbird 5-RC 1" Quick Coupling Valve. Reference design for actual part number, or approved equal as accepted by irrigation designer.
  - 2. Keys:
    - a. The valve shall be opened and closed by a single lug brass key with a detachable handle of the same manufacturer having a 3/4" inch MNPT.
    - b. The quick coupler key shall be a Hunter KH-44; Rainbird 55-K

- c. Provide a minimum of two keys per system.
- 3. Swivel Hose Ell:
  - a. The swivel hose ell shall be of heavy bronze construction, connected to the key for hose connections.
  - b. The swivel hose ells shall be 1-inch FIPT x 3/4-inch Male Hose Threads.
  - c. The hose swivel shall be as manufactured by the Toro; Hunter; Rainbird.
  - d. Provide a minimum of two swivels per system.
- G. Control Wire & Grounding:
  - 1. Control wiring for a conventional controller shall be 24-volt solid wire U.L. approved for direct burial.
    - a. 14-1-gauge non-white wire for control wire, 12-1-gauge white wire for common wire. Control wiring and wiring connections from the controller to the valves is within the scope of work for the irrigation contractor. Multi strand wire will not be accepted or wire sizes 16 gauge or smaller will not be accepted.
    - b. The controller will be grounded with a 4-inch x 36-inch grounding plate, 5/8-inch by 8-foot grounding rod and cad-weld by Paige Electric or Regency Wire. Clamps and wire nuts will not be accepted.
    - c. Control wiring for a two-wire decoder controller shall be a polyethylene double jacketed two-conductor solid core designed for direct burial with insulation 3/16 inch think, high density, sunlight resistant incased in an outer jacket of polyethylene.
    - d. All wire splices shall be made with 3M DBR or DBY direct bury splice kits.
- H. Drain Valves:
  - 1. Provide a manual drain valve for the main line piping and a manual drain valve for the piping in each circuit.
    - a. The manual drain valve shall be a 3/4 inch or larger brass or plastic ball type valve located at the lowest elevation point in the system or circuit.

- b. The valve shall be piped to a 4-cubic foot gravel drain pit or piped to daylight if adequate fall from the valve to the pipe end can be achieved.
- c. The valve shall be installed in a minimum 6 inch round valve box for easy access.
- d. In climates where the soil consistently freezes 2 inches deep or more each winter, a quick coupler valve shall also be installed just past the backflow prevention device to allow for compressed air blowout of the system.
- I. Backflow Prevention Device:
  - 1. The backflow prevention device shall be as specified in this section unless local codes allow for a double check valve assembly. The backflow prevention device shall:
    - a. Be a reduced pressure principle type suitable for supply pressure up to 175 psi and water temperatures up to 180°F.
    - b. Have a bronze body construction. It shall utilize silicon rubber for drip tight disc material in the first and second check valves plus the relief valve.
    - c. Be constructed with NPT body connections and have ball type test cocks.
    - d. Have quarter run, full port, resilient seated bronze ball valve shutoffs.
    - e. Consist of a pressure differential relief valve located in a zone between two positive seating check valves.
    - f. Have all access ports covers secured with stainless steel screws which are bolted to the valve body.
    - g. Have suitable connections for an air gap.
    - h. Meet all the requirements of ASSE Standard 1013; AWWA Standard C506, FCCCHR USC Manual, Section 10.
    - i. Only RPZ/DCV devices approved by the applicable Health Department will be acceptable. Plans and installation must conform to the applicable Water Authority's Cross Connection Control Booklet.
- J. Rainfall Sensor:
  - 1. Provide a rainfall sensor to shut the system off during substantial rainfall. The rainfall sensor shall be a Hunter or approved equal as accepted by irrigation designer.

- K. Winterization Assembly:
  - 1. If shown on the design, a winterization assembly will be installed downstream of the backflow prevention device.
    - a. The winterization assembly shall include an Isolation Valve that is to be brass or ductile iron that is line-sized with the mainline. Valves can be manufactured by Matco or Nibco.
    - A quick coupler shall be used that is downstream of the isolation valve. This is to be mounted on a schedule 80 or Brass 1x6-inch TBE Threaded both ends nipple. Quick coupler is to be a 100 Series 1" Quick Coupling Valve or approved equal as accepted by irrigation designer.

# L. Flow Meter

1. Flow meter shall be Rain Bird FS-200-P flow meter.

# PART 3 - EXECUTION

# 3.01 INSTALLATION

- A. Summary:
  - 1. Stake locations of each sprinkler in accordance with the plans.
  - 2. If discrepancies in the plan become apparent at this time, point out the discrepancy to the Owner's representative.
  - 3. Do not proceed with the work until the necessary design engineering changes have been made and approved by the Owner's representative.
  - 4. Install sprinkler system equipment with necessary hardware in accordance with the drawings and the manufacturer's instructions and as specified herein.
  - 5. Verify system design pressures prior to installation.
- B. Pipe Laying:
  - 1. Minimum cover over mains and control valves is 18" below finish grade. Minimum cover over laterals is 12".
  - 2. Minimum of 3" separation between parallel pipes in the same trench. Hold pipe securely in place while joint is being made.
  - 3. Rest full length of each pipe section firmly on bedding, excavating recesses to accommodate joints.
  - 4. Avoid trench heating electric ducts, storm and sanitary sewer lines, existing water and gas mains, all of which have right-of-way.
  - 5. Maintain a minimum separation of 2' from other utilities parallel to

irrigation pipes.

Sprinkler sections shall drain to the manual drain valve placed at the low point in the section.

- 6. Sand or fine-grained soils should be used for cover to a sufficient depth to prevent damage to the pipe from rocks or other debris in backfill during the compacting operation.
- 7. Do not cut sidewalk, drives, or curb during trenching for piping.
- 8. Use PVC sleeves under paved areas where possible; otherwise, auger bore or tunnel. Repair damaged paved surfaces during guarantee period.
- 9. Cover and protect open pipe ends, fixtures, and equipment from dirt, water, and chemical or mechanical damage during installation.
- 10. AT completion of work, thoroughly clean fixtures, exposed materials, and equipment.
- C. Laying Plastic Pipe:
  - 1. Snake in trench at least 1 foot per every 100 feet to allow for thermal expansion.
  - 2. Socket type fittings: Solvent weld by applying PVC primer to both pipe and fitting. Apply solvent to both pipe and fitting, twisting pipe a minimum of 1/4 turn as pipe is inserted to fitting to insure a uniform coverage of the solvent.
  - 3. Thread type fittings: Virgin liquid teflon lubricant or teflon tape all male thread components.
- D. Install Sprinkler Heads:
  - 1. Install pop-up spray heads and pop-up rotary heads flush with finish, settled grade.
  - 2. Place part circle heads no closer than 1 inch from edge of paved areas and no further than 4 inches from edge of paved areas.
  - 3. All sprinkler heads shall be installed with swing joints or Rainbird swing pipe and fittings or Toro funny pipe and fittings to allow for adjustment of the head and finish grade settling.
    - a. A swing pipe assembly shall consist of a minimum of 12 inches of swing pipe with fitting adapters at each end threaded into the circuit pipe fitting at one end and into the head at the other end.
    - b. A swing joint assembly shall consist of two street ells joined at one end of a 1/2-inch x 12 inch PVC Schedule 80 nipple and one street ell attached to the other end and threaded into the circuit pipe fitting.
- E. Wiring:

- 1. All wire runs should be installed with no splices between the controller and the remote control valves. If splices must be utilized, they should be kept to the minimum number possible.
- 2. All splices at the control valves shall be installed with appropriate electrical splice connection protection.
- 3. All splices at locations other than the control valves shall be installed with appropriate electrical splice connection protection and installed in a 6-inch round box for ease of locating.
- 4. Splices shall be 3M Company, DBR & DBY Connectors for conventional controllers and DBR-6 & DBY-6 Connectors for Two-wire controllers.
- 5. Provide 12" expansion loops in wiring at each wire splice (other than the remote control valve) and at each change of wire direction.
- 6. Provide a 24" expansion coil for each wire at each remote control valve and where each wire enters the controller conduit. Each 24" expansion coil shall consist of 6' of wire coiled around a 1/2" piece of pipe resulting in a 24" long coil.
- 7. Control wiring shall be run into the controller in a separate conduit from all power supply wiring and at least 10 inches apart if both are run in the same trench.
- F. Setting of Valves:
  - 1. All valves, quick coupler, master and electric remote control shall be located in the landscaped planter areas. In no case shall a valve be located beneath a paved surface.
  - 2. Master and electric remote control valves shall be installed in a level position only.
  - 3. Master and electric remote control valves shall be installed in a minimum 11" x 16" or larger plastic, rectangular, marked valve box. In no case shall more than one electric remote control valve be installed in one box unless a large, 18" x 24" or larger rectangular valve box is used.
  - 4. Quick coupler valves shall be installed in a 6" round plastic valve box with the top of the quick coupler valve as close as possible to finish grade as the valve box installation will allow.
  - 5. A minimum 2 cubic foot gravel pit shall be installed under each master, electric remote control valve, and quick coupler valve with the top surface of the gravel pit at least 2" below the bottom of the valve.
  - 6. A master valve shall be installed immediately after the backflow preventer to allow pressurization of the irrigation system only when the controller cycles to operation the irrigation stations. The master valve shall be the same size as the main line as indicated on the irrigation plans. The master valve shall be energized by the master valve circuit located in the controller.
- G. Sleeving:

- 1. Furnish and install PVC sleeving where control wires or pipe pass under paved surfaces as follows:
  - a. Of adequate size to allow retrieval for repair.
  - b. Extend 12" beyond the end of paving at each end.
  - c. Have a 4" bed of sand backfill above pipe.
  - d. Have a minimum of 30" of cover from finish grade.
  - e. Install permanent bench mark in curb for reference to all sleeve locations.

# 3.02 TEST AND FLUSHING

- A. Following installation, make final adjustments of lawn irrigation system preparatory to Owner's representative's final inspection:
  - 1. Flush system completely to remove debris, with nozzle removed.
  - 2. Verify sprinkler operation and alignment for the direction of throw.
  - 3. Check pop-up spray nozzling for proper arc of spray.
  - 4. Determine whether uniform distribution exists over all areas.
- B. Following final adjustment, operate the entire installation to demonstrate the complete and successful operation of all equipment.

# 3.03 WARRANTY

- A. The irrigation system shall be warranted for a period of one year from the time of acceptance, for parts and labor by the installing contractor. This warranty shall be bonded and written to the Owner for both the warranty and the maintenance as outlined in the maintenance section.
- B. The irrigation system equipment shall be warranted by the manufacturer for a period of three years from the date of installation, provided the system has been installed with all its equipment manufactured by one manufacturer. The only exception to this requirement are the electric remote control valves which shall be warranted for a period of 5 years by the manufacturer.

# 3.04 OPERATION AND MAINTENANCE

- A. Maintenance:
  - 1. Provide one hour operating instructions for Owner's representative prior to final acceptance.
  - 2. Provide on-job site consultation with Owner's operating personnel for 6 months, not to exceed 4 hours per month, at no charge to the Owner. Any

consultation work beyond this time limit shall be billed to the Owner on a time and materials basis. This extra consultation must be approved by the Owner's representative before said consultation shall be gin.

- 3. A three-year maintenance program with the property owner shall be included with the installation contract. This shall include all labor and materials to perform the following:
  - a. Spring start-up of the system as soon as weather permits in the spring. Spring start-up shall include, but is not limited to, setting of the controller for proper operation, turning on water supply (if it has been turned off), and all the components that were winterized (backflow valve, etc.), close all the manual drain valves, check all valves and heads for proper operation and adjustment.
  - b. Monthly checks of the system for proper operation and adjustment through the growing season.
  - c. Winterize the system in the fall, after the irrigation season is over and before the first major freeze. Winterizing includes, but is not limited to, draining system and/or compressed air blow-out of the system (air pressure not to exceed the working pressure of the system), setting the controller for winter operation, checking exposed components (backflow preventer, etc.) for potential freeze damage, and draining all the manual drain valves. Winterizing may also include items not included in these specs but are usually included in winterizing programs in the local area.
- B. Record Drawings and Controller Chart:
  - 1. Maintain a complete set of up-to-date as-built drawings.
  - 2. Prepare a controller chart:
    - a. Showing the location of all sections, valves, lateral lines, and routes of control wires.
    - b. Identify all valves as to size, station number, and type of irrigation head on each valve.
    - c. Showing each station's area of coverage using a color coding, each station having a different color shading its area of coverage.
    - d. Laminated between two pieces of plastic laminate.
    - e. Complete and receiving approval prior to final inspection of the irrigation system.

# END OF SECTION

# SECTION 02820

### PREFABRICATED ORNAMENTAL FENCE AND GATES

### PART 1 - GENERAL

### 1.01 SCOPE OF WORK

- A. The work under this Section consists of furnishing and installing steel picket fence and steel picket gates with posts, sleeves and appurtenances as shown on the drawings and as specified herein including all labor, materials and equipment necessary to finish the work complete in place. The fence must meet the requirements of the commercial ornamental steel fence system of the Ameristar<sup>®</sup> Aegis Plus<sup>®</sup> (Majestic<sup>TM</sup>) design or approved equal as manufactured by Master Halco 63 Manley St. W. Bridgewater, MA 02379 (800) 969-1669 or Anchor Fence, 1015 East Market Street Daly City, CA 94014(650) 757-2140 or other approved equal
- B. Fence must meet all playground code requirements for picket spacing, etc.

### 1.02 REFERENCE STANDARDS

A. References herein to any technical society, organization, group or body are made in accordance with the following abbreviations:

ASTM American Society for Testing Materials

AWS American Welding Society

CPSC Consumer Product Safety Commission

- 1.03 SHOP DRAWINGS
  - A. The Contractor shall submit complete manufacturer's shop drawings which shall include the horizontal layout and vertical alignment for the proposed installation to the Engineer for approval. Field verify all post sleeve spacing prior to fabrication. No material may be ordered prior to receiving written approval from the Owner's Representative.
- 1.04 SAMPLES
  - A. The Contractor shall supply representative samples, in factory-sealed containers, of the cold galvanizing compound (for touch up ONLY) and the finish paint and primer, if necessary. Also, provide samples of other fencing materials and hardware as the Engineer requests.

B. The Contractor shall submit finished samples of all parts of the fences for the Owner's Representative review and approval. The workmanship and finish of the completed fences shall equal the approved samples.

# PART 2 - MATERIALS

### 2.01 STEEL MEMBERS

- A. Posts shall be carbon steel structural tubing conforming to ASTM Designation A500.
  - 1. Material for fence pickets shall be 3/4" square x 17 Ga. tubing
  - 2. Sleeves for fence posts shall be 3" x 3" x 1/2" thickness steel square tube weighing 20.88 lbs./ft.
- B. Galvanizing:
  - 1. Hot-dip galvanize all items under this section in compliance with ASTM A 123, ASTM A 153, or ASTM A 386. Provide minimum 1.5 oz./ft.<sup>2</sup> zinc coating. Galvanize after fabrication.
  - 2. Following galvanizing, each item shall receive surface grinding to remove lumps, sags or spikes resulting from the galvanizing process. The finished surface following grinding shall be hand smooth and without irregularities. Take care not to damage the galvanized surface coating.
- C. Pickets, top and bottom rails and crossbars and hinge assemblies, called for on the drawings, shall conform to ASTM Designation A36.
- D. Bolts, nuts, washers and any other fasteners shall conform to ASTM Designation A307.
- E. Post caps shall be cast iron or steel in the sizes required, finished in conformance with all other fence elements. Caps shall be as manufactured by Julius Blum & Co., Inc., Carlstadt, New Jersey; Boundary Fence and Railing Systems, Inc. Richmond Hill New York; Monumental Iron Works, Inc., Baltimore, Maryland; or approved equal. All caps are to be coated with a minimum 3.0 mil thickness of liquid galvanizing compound by dipping.
- F. All gates shall be equipped with a positive type latching device capable of retaining the gate in a closed position and have provision for padlock. Latches shall permit operation from either side of gate and must be approved by the Landscape Architect prior to the installation
- G. Double gates: Provide locking cane-bolt style drop rod to hold inactive leaf. Provide gate stop pipe to engage center drop rod. Provide locking device and padlock eyes as an

integral part of the latch, requiring one padlock for locking both gate leaves.

- 2.02 FINISH
  - A. Cold galvanizing compound shall be a single component zinc rich compound yielding a dry film of at least 85% pure zinc. Galvanizing compound shall meet or exceed the requirements of Federal Specification MIL-P-21035, TT-P-641d primer for zinc rich compounds.
  - B. Finish color coating shall be Color Galvanized Black as provided by Duncan Galvanizing, Inc., or approved equal.
- 2.03 CEMENT CONCRETE
  - A. Cement concrete for footings and edgings shall conform to Section 03300 of these Specifications.

# PART 3 - EXECUTION

- 3.01 FENCE FABRICATION, GALVANIZING FINISHING AND ERECTION
  - A. The fence sections shall be shop fabricated in strict conformance to the sizes and dimensions called for on the approved shop drawings and in accordance with these specifications, all as field verified by the Contractor.
  - B. All welding shall be by arc welding process conforming to the latest AWS Specifications. All welds shall be as designated on the drawings, shall be ground smooth to a neat finish and shall be watertight with care to minimize locked-up stresses and distortion due to hear. All welds shall be made on bare, clean metal equal to "white" metal.
  - C. After fabrications, all steel surfaces shall be thoroughly cleaned of all mill scale, rust, dirt, weld flux, weld splatter and other foreign matter by power wire brushing or sand blasting.
  - D. Prime and finish all materials in accordance with industry requirements. Galvanizing shall provide a visually acceptable substrate for applied coatings, and be free of lumps, globules, or heavy deposits which will interfere with intended use or esthetic appearance of materials.
  - E. Field erection of the fabricated fence sections shall be as called for on the drawings. Excavation for post footings shall conform to Section 2.04 of these Specifications. Fence posts shall be set plumb in cement concrete footings which shall be mixed and placed in accordance with Section 9.01 of these Specifications. The fence rails shall be parallel to the walk and the fence posts and pickets shall be set plumb, when the fence is erected into its final position.

G. Surfaces that are abraded or damaged during field erection or from which galvanizing compound has been damaged shall be thoroughly wire brushed and cleaned, removing all loose and cracked coating, after which the surface shall be painted with two (2) coats of the approved cold galvanizing compound.

# 3.02 TOUCHUP PAINTING

A. After erection, all rust spots, scratches or abrasions in the galvanized surface shall be repaired with finish surfacing treatments that are compatible with factory applied color galvanizing applications and satisfactory in all regards to the Engineer.

# END OF SECTION

## TEMPORARY CHAIN LINK FENCE

## PART 1 - GENERAL

## 1.01 WORK INCLUDED:

- A. The Contractor shall provide all labor, materials and appurtenances necessary for the installation, maintenance and dismantling of 8-foot temporary fencing.
- B. The Contractor shall be responsible for securing the site from trespassers. Existing fencing exists on portions of the site as shown on the Contract Drawings; it will be at the discretion of the Contractor to determine whether the existing fence is suitable for site safety and security. The Contractor shall install temporary fencing across lengths of damaged/unsuitable fencing to secure the site and prevent trespassers.
- 1.02 SUBMITTALS: IN ACCORDANCE WITH REQUIREMENTS OF GENERAL SPECIFICATIONS, SUBMIT THE FOLLOWING:
  - A. Six sets of manufacturers literature of the materials specified herein shall be submitted to the Engineer for review.
  - B. Six sets of shop drawings of the temporary chain link fence and gates shall be submitted to the Engineers for review.
    - 1. Shop drawings shall indicate layout of temporary fencing, location and size of gates, existing pavement and roads, and other site specific conditions. Prepare drawing after site observation and verification of existing conditions.

## PART 2 - PRODUCTS-GALVANIZED

- 2.01 TEMPORARY CHAIN LINK FENCING:
  - A. Unless otherwise indicated, type of 6-foot temporary chain link fencing shall be Contractor's option. Following types are acceptable:
    - 1. New materials or previously used salvaged chain link fencing in good condition.
    - 2. Posts: Galvanized steel pipe of diameter to provide rigidity. Post shall be suitable for setting in concrete footings, driving into ground, anchoring with base plates, or inserting in precast concrete blocks.
    - 3. Fabric: Woven galvanized steel wire mesh. Provide in continuous lengths to be wire tied to fence posts or prefabricated into modular pipe-framed fence panels.
  - B. Gates: Provide gates of the quantity and size indicated on the Contract Drawings or

required for functional access to Site.

- 1. Fabricate of same material as used for fencing.
- 2. Vehicle gates:
  - a. Minimum width: 20 feet to allow access for emergency vehicles.
  - b. Capable of manual operation by one person.
- C. Scrim Fabric: Contractor shall provide scrim fabric at all temporary chain link fencing, and at all existing chain link fencing to remain abutting private residences.

## PART 3 - EXECUTION

#### 3.01 INSTALLATION:

A. The fence and gates shall be erected by skilled mechanics in accordance with the recommendations of the manufacturer and these specifications. These specifications shall take precedence over the recommendations of the manufacturer if any discrepancy exists between them.

## B. Posts

- 1. Maximum post spacing shall be 10-feet. Post spacing shall be uniform and posts shall be plumb.
- 2. Drive posts, set in holes and backfill, or anchor in precast concrete blocks.
- 3. For soft and unstable ground conditions, cast concrete plug around post.
- 4. Posts over pavement: Use steel post plates or precast concrete blocks.
- 5. Gate posts: Use bracing or concrete footings to provide rigidity for accommodating size of gate.
- 6. Temporary terminal posts shall be securely connected to existing fence posts to prevent site access/trespassing.
- C. Securely attach wire fabric to posts. Maximum area of unbraced fence fabric shall not exceed 1,500 square feet.
- D. Install with required hardware.
- E. Fabric shall be stretched taut, with the bottom edge following the existing grade, and shall be a continuous mesh between terminal posts. Each span of fabric shall be attached independently at terminal posts. Where terminal posts do not have provisions for weaving fabric to posts, stretcher bars shall be placed through the end weave of the fabric and secured to the post with bar bands spaced not more than 15-inches apart on the post.

Temporary terminal posts shall be secured to existing fence posts to prevent Site access/trespassing.

- F. Fabric shall be attached with ties to line posts at intervals of not more than 14-inches (and to the top railing and braces at intervals not exceeding 24-inches).
- G. The bottom tension wire shall be interlaced in the weave of the fabric, pulled taut and fastened to terminal posts.
- 3.02 MAINTENANCE AND REMOVAL
  - A. Maintain fencing in good condition. If damaged, immediately repair.
  - B. Remove temporary fencing upon completion of Work or when no longer required for security or control. Backfill holes and compact. Holes in pavement shall be surfaced to match existing paving. Repair damage caused by installation of temporary fencing.

# END OF SECTION

#### BLACK VINYL CHAIN LINK FENCE AND NETTING

#### PART 1 - GENERAL

#### 1.01 WORK INCLUDED:

- A. The Contractor shall provide all labor, materials and appurtenances necessary for the installation of a complete chain link fence systems and shall meet or exceed the standards of the Chain Link Fence Manufacturer's Institute, New York, NY except as otherwise indicated on the Drawings and as herein specified.
- B. The manufacturer shall supply a total vinyl PVC coated chain link fence system of the height, fabric type, fabric gauge, framework strength, color and coating specifications contained herein. All fence materials unless specifically stated otherwise, shall be extrusion bonded polyvinyl chloride (PVC) coated.
- C. The Contractor shall provide all labor, materials and appurtenances necessary for the installation of a complete safety netting system and shall meet or exceed the standards indicated on the drawings and as herein specified.
- 1.02 RELATED WORK:
  - A. Section 01330, SUBMITTALS
  - B. Section 03300, CAST-IN-PLACE CONCRETE
- 1.03 REFERENCES:
  - A. The following standards form a part of this specification as referenced.

American Society for Testing and Materials (ASTM)

ASTM Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and A53 Seamless ASTM A392 Zinc Coated Steel Chain Link Fence Fabric ASTM A123 Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products ASTM A153 Zinc Coating (Hot-Dip) on Iron and Steel Hardware ASTM F567 Installation of Chain Link Fence ASTM **Fence** Fittings F626

- ASTM F668 Specification for Poly Vinyl Chloride (PVC) Coated Steel Chain-Link Fence Fabric.
- ASTM F1043 Strength and Protective Coatings on Metal Industrial Chain Link Fence Framework.

Federal Specifications (FS)

- FS RR-F-191 Fencing Wire and Post, Metal (and Gates, Chain-Link Fabric, and Accessories)
- 1.04 SUBMITTALS: IN ACCORDANCE WITH REQUIREMENTS OF GENERAL SPECIFICATIONS, SUBMIT THE FOLLOWING:
  - A. Six sets of manufacturers literature of the materials specified herein shall be submitted to the Engineer for review.
  - B. Six sets of shop drawings of the fence and the proposed color shall be submitted to the Engineer for review.
- 1.05 WARRANTY:
  - Prior to installation, the fence contractor shall provide the fence manufacturer's notarized certification that all galvanized components are fully warranted by the manufacturer for 15 years against rust and corrosion.

## PART 2 - PRODUCTS

- 2.01 STEEL FRAMEWORK:
  - A. All posts, gate frames, braces and horizontal rails shall be Type I round post, hot dipped galvanized with a minimum average coating of 1.8 oz/ft<sup>2</sup>, meeting ASTM F 1083 for Standard Weight Galvanized Pipe and shall be of the sizes and weights given below or other approved equivalent sections of steel having a minimum tensile strength of 50,000 pounds per square inch and a minimum yield strength of 25,000 pounds per square inch.
  - B. Minimum cross-section dimensions for line posts of specified shape shall be: either 2-3/8-inch (2.375-inch) outside diameter steel pipe weighing not less than 3.65 pounds per linear foot; or 2.25 by 1.95 by 9/64-inch steel H section weighing not less than 4.10 pounds per linear foot.
  - C. Minimum cross-section dimensions for end, corner, and pull posts of specified shape shall be: 2-7/8-in. (2.875-in.) outside diameter steel pipe weighing not less than 5.79 pounds per linear foot; 2-1/2 by 2-1/2-inch square tubes weighing not less than 5.70 pounds per linear foot; or 3-1/2 by 3-1/2-inch rolled-formed sections weighing not less than 8.14 pounds per linear foot.

- D. All tubular and pipe posts shall be capped to prevent precipitation from entering the post, unless a barbed wire extension arm assembly acts as a cap.
- E. Posts, other fence framework, accessories, fittings, and miscellaneous items shall be galvanized and have a extrusion bonded polyvinyl chloride (PVC) coating. The PVC coating on posts shall be a minimum of 10 mils thick. Framework color coating shall match fabric. Galvanized finish shall have not less than the following weight of zinc per square foot:
  - 1. Pipe: 1.8 oz, complying with ASTM A53.
  - 2. H-sections and square tubing: 2.0 oz, complying with ASTM A123.
  - 3. Hardware and accessories: Comply with Table I of ASTM A153.
- F. For top railings and top, middle and bottom braces between terminal posts and adjacent lines posts, the minimum cross-section dimensions for the specified shall be 1-5/8-inch outside diameter steel pipe weighing not less than 2.26 pounds per linear foot.
- G. Diagonal truss braces between terminal and adjacent line posts and for gauge framework shall not be less that either 3/8-inch diameter steel rod or double No. 9 AWG steel wire stranded together.
- H. Fittings shall be galvanized press steel, malleable or cast steel as specified in ASTM F626 and Federal Specification RR-F-191.
- I. Where posts do not have provisions for weaving fence fabric to posts, tension or stretcher bars for attaching fabric to terminal posts such as end, corner, gauge and pull posts, shall be flat bar with nominal dimensions no less than 3/16 by 3/4-inch for use with fence fabric having mesh larger than l-inch, of a length equal to full height of the fence fabric, and used with bar bands, bolts and nuts. Bar bands shall be no thinner than No. 11 gauge coated sheet steel. Bolt diameters shall be not less than 3/8-inch for use with bar bands.
- J. Ties for fastening fence fabric to line posts and rails shall be not less than No. 9 AWG steel wire with the same coating as the fence fabric or other approved bands.
- 2.02 CHAIN LINK FENCE FABRIC:
  - A. Vinyl coated fabric shall be supplied with Class 2A (extrusion bonded) vinyl coating. The coating shall be applied over a galvanized steel core wire and be manufactured in accordance with Federal Specifications RR-F-191 and ASTM F668. The PVC coating shall have a final coating thickness of 0.015-0.025-inch and a core wire size diameter of 0.148-inch.
  - B. Wire size: The finished wire size shall be 6 gauge.
  - C. Height and Mesh Size: The fabric height shall be per drawings with a mesh size of 2-inches.

- C. Selvage: Top edge and bottom edge of the fabric shall be knuckled.
- D. The tension wires shall either be <u>No. 7 gauge or 9 gauge</u> steel-core wire. PVC coating shall conform to ASTM F668 Class 2a or 2b. Also, a 7-strand galvanized steel <sup>1</sup>/<sub>2</sub>-inch guy wire with PVC coating may be supplied. [NOTE TO SPECIFIER: Use 7 Gauge for heavy duty fence, 9 Gauge for light duty fence.]
- F. The polyvinyl chloride (PVC) coating shall be free of voids, shall be dense and impervious, shall be of a plasticized or epoxy modified, high specific gravity polyvinyl chloride with high resistance to tear and suitable hardness. The PVC coating shall not support combustion and shall withstand an accelerated aging and weathering test a minimum of 2,000 hours at 145 degrees F with ultraviolet and salt spray without cracking or peeling the PVC coating and without corrosion of the base metal. The PVC coating shall withstand a mandrel bending test of ten times the thickness of the base metal at minus 25 degrees F without cracking. The PVC coating shall not separate from the metal or shrink. Color used in PVC coating shall be stabilized so that it will not fade under long exposure to sunlight. Color shall be approved by the Engineer as selected from the manufacturer's standard colors.

## 2.03 SWING GATES:

- A. Gate leaf frames shall be amply braced and trussed for rigidity. Truss rods shall be adjustable. Gate leaf framework shall be pipe or other approved suitable cross-section of the size recommended by the fencing manufacturer for the size of gate leaf, but shall be no smaller than 1-7/8-inch (1.875-inch) outside diameter steel pipe weighing not less than 2.72 pounds per linear foot. If bolted or riveted corner fittings are not used, the gate frame shall have the corrosion-resistant finish applied after welding.
- B. Gates, gate posts, fabric and associated hardware shall be thermally coated with PVC, 10 mils thick, to match the fence.
- C. Gate hinges shall be 180 degree, heavy pattern, of adequate strength for the gate size, with large bearing surfaces for clamping or bolting in position, and with hinge action such that the gates may be opened and closed easily.
- D. Gates shall be provided with accessible, suitable latches and provisions for padlocking.
- E. Double leaf gates shall have center bolts and center stops. Unless indicated otherwise on the drawings, the gates shall have automatic backstops to hold the leaves in open position.
- F. For gate openings, up to and including 12-feet, with double leaf gates, minimum cross-section dimensions for the gate posts of specified shape shall be the same as specified above for end posts.
- G. For gate openings larger than 12 feet, the minimum outside diameter for the gate posts shall be 6-5/8-inches, weighing not less than 18.97 pounds per linear foot.

- I. Concrete for post foundation bases shall be 3000 psi concrete as specified under Section 03300, CAST-IN-PLACE CONCRETE.
- J. Grout for posts set in solid rock shall consist of one part Portland cement and three parts clean, sharp, well graded sand with just enough water for proper workability. The grout shall be thoroughly worked into the hole so as to leave no voids, and shall be crowned to shed water from the post.

# 2.04 SAFETY NETTING

- A. Safety Netting
  - Model #TFBSS630P-SG, 6.625" O.D., 6" schedule 40 aluminum straight pole ball stopper system with standard coated black pole finish. Model TFBSS-NET-ULTRACROSS, 4 ply ultra-cross dyneema knotless UHMWPE netting, 1<sup>3</sup>/<sub>4</sub>" square mesh with sewn rope binding on perimeter edges as manufactured by Sportsfield Specialties, Inc., 41155 State Highway 10, PO Box 231, Delhi, NY 13753, 1-888-3343, www.sportsfieldspecialties.com or approved equal.
  - 2. Model MBS-20, 6" O.D. aluminum tube ball stopper system with model M400, 1<sup>3</sup>/<sub>4</sub>" square, knotless HTPP, DBB, net, <sup>1</sup>/<sub>4</sub>" MFP rope border, UV protected and <sup>1</sup>/<sub>4</sub>" cable hog tied to top of net as manufactured by Aluminum Athletic Equipment, or approved equal.
  - 3. Model SEBS20 straight ball stop, 6" O.D. aluminum poles. 1 <sup>3</sup>/<sub>4</sub>" square mesh, knotless HTPP nets with extra UV stabilizers, supported by a vinyl coated galvanized steel 7x7 aircraft cable as manufactured by SportsEdge or approved equal.

# PART 3 - EXECUTION

## 3.01 ERECTION:

- A. The fence and gates shall be erected by skilled mechanics in accordance with the recommendations of the manufacturer and these specifications. These specifications shall take precedence over the recommendations of the manufacturer if any discrepancy exists between them.
- B. Maximum post spacing shall be 10-feet. Post spacing shall be uniform and posts shall be plumb. All end, corner, pull and gate posts must be set in concrete. Line posts may be secured by driven blades.
- C. Concrete post foundations in earth shall be concrete cylinders with a minimum diameter of 12-inches, crowned at grade to shed water, and shall extend not less than 3-feet into the ground. Posts shall be set in the full depth of the foundations except for 3-inches of

concrete under the posts. If foundation holes are excavated in unsuitable material, the Engineer shall be notified for determination of suitable construction precautions.

- D. If solid rock is encountered without an overburden of soil, poles shall be set into the rock a minimum depth of 12-inches for line posts and 18-inches for terminal posts, such as end, corner, gate and pull posts, and grouted into solid rock with the post hole diameter a minimum of one inch larger than that of the post.
- E. Where solid rock is covered by an overburden of soil or loose rock, the posts shall be set into the rock as specified above. The total pole setting depth shall not exceed the depths required for setting in earth.
- F. Any change in direction of fence line of 30 degrees or more shall be considered as a corner. Pull posts shall be used at all abrupt changes in grade. Maximum area of unbraced fence shall not exceed 1,500 square feet.
- G. Terminal posts such as end, corner, gate and pull posts shall be braced to the adjacent post(s) with horizontal rail braces used as compression members and diagonal truss braces with truss tighteners for tension members, with the lower ends at the terminal post in each panel of fence framework as indicated in detail on drawings.
- H. The top railing shall pass through intermediate or line post tops, form a continuous brace with all splices made by approved couplings, and shall be fastened to terminal posts.
- I. Fabric shall be stretched taut, with the bottom edge following the finished grade, and shall be a continuous mesh between terminal posts. Each span of fabric shall be attached independently at terminal posts. Where terminal posts do not have provisions for weaving fabric to posts, stretcher bars shall be placed through the end weave of the fabric and secured to the post with bar bands spaced not more than 15-inches apart on the post.
- J. Fabric shall be attached with ties to line posts at intervals of not more than 14-inches (and to the top railing and braces at intervals not exceeding 24-inches).
- K. The bottom tension wire shall be interlaced in the weave of the fabric, pulled taut and fastened to terminal posts.
- K. The top and bottom tension wire shall be fastened to the fabric, using hog rings every 12inches, pulled taut and fastened to terminal posts. The tension wires shall be installed 6inches from the top and bottom of the fabric.
- 3.02 SAFETY NETTING ERECTION:
  - A. Safety Netting
    - 1. The Contractor shall layout the Safety Netting and place wood stakes as required at post locations and then notify the Owner's Representative that the unit has been laid out. It shall be the Contractor's responsibility to offset the

stakes installed by his Engineer and take extreme care not to disturb these stakes before incorporating them into his work. Layout shall include setting of wood stakes at each post location in the field.

- 2. The Contractor shall excavate for proposed post footings and shall inspect the excavation to ensure that surrounding areas of footing are stable and holding vertically.
- 3. Pour footings against undisturbed subsoil and onto compacted bottom of void. Set posts plumb and to the proper heights for assembly and place foundations.
- 4. Allow footings to cure sufficiently prior to assembly of netting, and brace and stay all posts sufficiently until curing is adequate.
- 5. Under mow curbs, pitch tops of footings one (1) inch away from posts.
- 6. Backfill and compact in no greater than eight (8) inch layers around footings.

# END OF SECTION

## STEEL BARRIER GATE

#### PART 1 – GENERAL

#### 1.01 WORK INCLUDED:

A. Furnish and install a Barrier Gate in the location(s) indicated on Drawings.

## 1.02 RELATED WORK:

- A. Section 02300 EARTHWORK
- B. Section 03300 CONCRETE
- 1.03 SYSTEM DESCRIPTION:
  - A. The Contract Drawings show the character and extent of the work to be performed and provided but does not attempt to show all methods, materials and details of construction, etc. Supplementary components customarily necessary to complete an item, though such parts are not definitely shown or specified, shall be included as part of the gate.

#### 1.04 **REFERENCES**:

A. The following standards form a part of this specification, as referenced:

#### American Society of Testing and Materials

ASTM	A36	Structural Steel
ASTM	A53	Pipe, Steel, Black and Hot-Dipped Zinc-Coated Welded and Seamless
ASTM	A153	Zinc Coating (Hot-Dip) on Iron and Steel Products

## American Welding Society

- AWS Code Standard for Arc and Gas Welding
- 1.05 SUBMITTALS: IN ACCORDANCE WITH REQUIREMENTS OF GENERAL SPECIFICATIONS, SUBMIT THE FOLLOWING:
  - A. Before fabricating or assembling of any components, the Contractor shall submit six (6) copies of shop drawings for all work included in this section to the Engineer for review and approval.
  - Β.

## PART 2 – PRODUCTS:

## 2.01 MATERIALS:

- A. Steel pipe shall be Schedule 40 and the size as indicated on the Drawings.
- B. Steel pipe shall conform to ASTM A53.
- C. Steel shapes, plates and bars shall conform to ASTM A36.
- C. Posts, bar gate and diagonal brace diameters shall be as shown on the drawings.

## PART 3 – EXECUTION

- 3.01 QUALITY ASSURANCE;
  - A. Barrier Gate shall be complete in accordance with this section and the contract Drawings.
  - B. All intersecting pipe joints shall be shop fillet welded.

## 3.02 INSTALLATION:

- A. Barrier Gate shall be installed at the location(s) indicated on the Contract Drawings and in accordance with this section.
- B. The gate components shall be assembled as shown on the drawings, welded all sides and ground smooth.
- C. The posts shall be encased in concrete foundations as shown on the drawings.
- D. A padlock shall be furnished to the Owner, and if applicable, keyed to the Owner's standard requirements.

- 3.03 PAINTING:
  - A. All exposed pipe and appurtenances to be painted with Zinc Rich Primer plus one coat of Catalyzed Epoxy and a finish coat of Acrylic Polyurethane by Tnemec Co. or approved equal.
- 3.04 CLEAN-UP:
  - A. Remove all excess materials from the work-site when completed with the Barrier Gate installation.

## END OF SECTION

#### SEGMENTAL RETAINING WALL SYSTEM

#### PART 1 - GENERAL

#### 1.01 WORK INCLUDED:

A. Work shall consist of designing, furnishing all materials, labor, equipment, and installation of the segmental retaining wall system in accordance with these specifications and to the lines, grades, and dimensions shown on the plans.

#### 1.02 RELATED WORK:

- A. Shop Drawings: Submit shop drawings in accordance with Division 1 requirements.
- B. Section 02300, EARTHWORK

#### 1.03 REFERENCE STANDARDS:

- A. The Massachusetts Department of Transportation Standard Specifications for Highways and Bridges Construction.
- B. Segmental Retaining Wall Units
  - 1. ASTM C 1372 Standard Specification for Segmental Retaining Wall Units
  - 2. ASTM C 140 Standard Test Methods of Sampling and Testing Concrete Masonry Units
- C. Geosynthetic Reinforcement
  - 1. ASTM D4595 Tensile Properties of Geotextiles by the Wide-Width Strip Method
  - 2. ASTM D5262 Test Method for Evaluating the Unconfined Creep Behavior of Geosynthetics
  - 3. GRI:GG1 Single Rib Geogrid Tensile Strength
  - 4. GRI:GG5 Geogrid Pullout
- D. Soils
  - 1. ASTM D 698 Moisture Density Relationship for Soils, Standard Method
  - 2. ASTM D 422 Gradation of Soils
  - 3. ASTM D 424 Atterberg Limits of Soil

- E. Drainage Pipe
  - 1. ASTM D 3034 Specification for Polyvinyl Chloride (PVC) Plastic Pipe
  - 2. ASTM D 1248 Specification for Corrugated Plastic Pipe
- F. Engineering Design
  - 1. "NCMA Design Manual for Segmental Retaining Walls", Latest Edition
- G. Where specifications and reference documents conflict, the Engineer shall make the final determination of applicable document.

# 1.04 DESIGN CRITERIA:

- A. The design for the final retaining wall plans shall be prepared and sealed by a professional Structural Engineer licensed in the Commonwealth of Massachusetts, engaged and paid for by the Contractor.
- B. The design analysis shall consider the external stability against sliding and overturning, internal stability, facial stability of the reinforced soil mass, and external global stability and shall be in accordance with acceptable engineering practice and these specifications. The internal and external stability analysis shall be performed in accordance with the "NCMA Design Manual for Segmental Retaining Walls", using the recommended minimum factors of safety in this manual.
- C. The following soil parameters shall be assumed for the final design unless otherwise shown on the plans or specified by the Engineer:

	Unit Weight (pcf)	Internal Friction Angle, degrees	Cohesion
Reinforced Fill	120	30	0
Retained Soil	120	30	0
Foundation Soil	120	30	0

- D. Precast sections shall be designed to withstand earth loads due to soil plus live loads due to vehicular traffic (HS-20 loading). Design and construction of each section shall meet the requirements of ACI 318 and the AASHTO Load Factor.
- E. Should the actual soil conditions observed during construction differ from those assumed for the design, design shall be reviewed by the manufacturer's Wall Design Engineer at the Engineer's direction.

- F. The design of the geosynthetic reinforcement shall take into consideration the effects from obstructions.
- G. Minimum embedment: the minimum wall embedment shall be the greater of 0.5 feet or the following:

Level Slope in Front	H'/20
3H:1V Slope in Front	H'/10
2H:1V Slope in Front	H'/10

where H' is the exposed height of the wall.

- H. While vertical spacing between geosynthetic reinforcement layers may vary, it shall not exceed 2.0 feet maximum in the wall design.
- I. The geosynthetic reinforcement placement in the wall design shall have 100 percent continuous coverage parallel to the wall face. Gapping between horizontally adjacent layers of geosynthetic (partial coverage) will not be allowed.

# 1.05 SUBMITTALS: IN ACCORDANCE WITH REQUIREMENTS OF GENERAL SPECIFICATIONS, SUBMIT THE FOLLOWING:

- A. Material Submittals: The Contractor shall submit six (6) sets manufacturers' literature and certifications two weeks prior to start of work stating that the SRW units and geosynthetic reinforcement meet the requirements of Section 2 of this specification.
- B. Design Submittal: The Contractor shall submit six (6) sets of detailed design calculations and final retaining wall plans for approval at least two weeks prior to the beginning of wall construction. All calculations and drawings shall be prepared and sealed by a professional Civil Engineer licensed in the Commonwealth of Massachusetts.

## 1.06 DELIVERY AND STORAGE:

- A. Contractor shall check materials upon delivery to assure that specified type and grade of materials have been received and proper color and texture of SRW units have been received.
- B. Contractor shall store and handle materials in accordance with manufacturer's recommendations and in a manner to prevent deterioration or damage due to moisture, temperature changes, contaminants, corrosion, breaking, chipping or other causes.

C. Contractor shall protect materials from damage. Damaged materials shall not be incorporated into the retaining wall.

# PART 2 - PRODUCTS

## 2.01 SEGMENTAL BLOCK WALL (SRW) UNITS:

- A. SWR units shall be Redi-Rock Wall System as manufactured by Redi-Rock International, Shea Wall System units as manufactured by E.F. Shea/New England Concrete Products, Inc., Unilock Sienastone Retaining wall system, or an approved equal.
- B. Texture on the faces of the block shall be limestone or approved equal. All exposed vertical faces shall have this textured finish. SWR units shall be single-faced or double faced, as indicated on the drawings.
- C. SRW units shall provide a minimum weight of 110 psf of wall face area.
- D. If connectors are used by the SRW supplier to interconnect the SRW units, they shall meet the requirements of the manufacturer.
- E. SRW units shall be sound and free of cracks or other defects that would interfere with the proper placing of the unit or significantly impair the strength or permanence of the structure. Cracking or excessive chipping may be grounds for rejection. Units showing cracks longer than ½-inch shall not be used within the wall. Units showing chips visible at a distance of 30 feet from the wall shall not be used within the wall.
- F. Concrete used to manufacture SRW units shall have a minimum 28 days compressive strength of 4,000 psi and a maximum moisture absorption rate, by weight, of 8% as determined in accordance with ASTM C1372. Compressive strength test specimens shall conform to the saw-cut coupon provisions of ASTM C140.
- G. SRW units' molded dimensions shall not differ more than + 1/8-inch from that specified, in accordance with ASTM C1372.

## 2.02 GEOSYNTHETIC REINFORCEMENT:

A. Geosynthetic reinforcement shall consist of geogrids or geotextiles manufactured as a soil reinforcement element. The type, strength, and placement location of the reinforcing goesynthetic shall be determined by the Engineer providing the wall design and as shown on the approved segmental retaining wall plans and detail drawings.

- B. Detailed test data shall be submitted to the Engineer for approval and shall include the following:
  - 1. Tensile strength in accordance with ASTM D 4595 or GRI GG-1.
  - 2. Creep in accordance with ASTM D 5262.
  - 3. Site damage and durability in accordance with GRI GG-4.
  - 4. Pullout in accordance with GRI GG-5 or GRI GT-6
  - 5. Connection test data in accordance with NCMA SRWU-1.

# 2.03 LEVELING PAD:

A. Material for the leveling pad shall consist of crushed stone meeting the requirements of Section M2.01.3 or M2.01.4 of the Massachusetts Department of Transportation Standard Specifications for Highways and Bridges Construction and shall be a minimum of 6-inches in depth unless otherwise shown on the Contract Drawings. The leveling pad must extend a minimum of 6-inches from both the front and back faces of the block unless otherwise shown on the Contract Drawings. Lean concrete with a strength of 200-300 psi and three inches thick maximum may also be used as a leveling pad material with approval by the Engineer.

# 2.04 DRAINAGE AGGREGATE:

 Drainage aggregate shall be crushed stone meeting the requirements of Section M2.01.4 of the Massachusetts Department of Transportation Standard Specifications for Highways and Bridges Construction.

# 2.05 DRAINAGE PIPE:

- A. The drainage collection pipe shall be a perforated or slotted PVC, or corrugated HDPE pipe. The drainage pipe may be wrapped with a geotextile to function as a filter.
- B. Drainage pipe shall be manufactured in accordance with ASTM D 3034 and/or ASTM D 1248.

# 2.06 REINFORCED BACKFILL:

A. The reinforced backfill shall be free of debris. Unless otherwise noted on the approved segmental retaining wall plans prepared by the Wall Design Engineer, the reinforced material shall consist of Type B Gravel Borrow in accordance with

Section M1.03.0 of the Massachusetts Department of Transportation Standard Specifications for Highways and Bridges Construction.

## 2.07 GEOTEXTILE FABRIC:

 Geotextile fabric shall meet the requirements of Type II in accordance with Section M9.50.0 of the Massachusetts Department of Transportation Standard Specifications for Highways and Bridges Construction.

## PART 3 - EXECUTION

## 3.01 INSPECTION:

A. Contractor's field construction supervisor shall have demonstrated experience and be qualified to direct all work at the site.

## 3.02 EXCAVATION:

- A. Contractor shall excavate to the lines and grades shown on the project grading plans. Contractor shall take precautions to minimize over-excavation. Over-excavation shall be filled with compacted backfill material as required by the Engineer, at the Contractor's expense.
- B. Contractor shall verify location of existing structures and utilities prior to excavation. Contractor shall ensure all surrounding structures are protected from the effects of wall excavation. Excavation support, if required, is the responsibility of the Contractor.

## 3.03 FOUNDATION PREPARATION:

- A. Following the excavation, the foundation soil shall be examined by the Engineer to assure actual foundation soil strength meets or exceeds the assumed design bearing strength. Soils not meeting the required strength shall be removed and replaced with material, as required by the Engineer.
- B. Foundation soil shall be proof rolled and compacted to 95% standard Proctor density and inspected by the Engineer prior to placement of leveling pad materials.
- 3.04 LEVELING PAD CONSTRUCTION:

A. Leveling pad shall be placed as shown on the final, approved P.E. sealed retaining wall drawings. The leveling pad shall have a minimum thickness of 6-inches. The leveling pad should extend laterally at least a distance of 6-inches from the toe and heel of the lower most SRW unit unless shown otherwise on the Contract Drawings.

## 3.05 SRW UNIT INSTALLATION:

- A. All SRW units shall be installed at the proper elevation and orientation as shown on the final, approved wall drawings or as required by the Engineer. The SRW units and geosynthetic reinforcement shall be installed in accordance with the manufacturer's recommendations.
- B. First course of SRW units shall be placed on the leveling pad with the aesthetic surface facing out. The units shall be leveled side-to-side, front-to-rear and with adjacent units, and aligned to ensure intimate contact with the leveling pad.
- C. Prior to placement of next course, the level and alignment of the units shall be checked and corrected, where needed.
- D. Layout of curves and corners shall be installed in accordance with the wall plan details or in general accordance with SRW manufacturer's installation guidelines.
   Walls meeting at corners shall be interlocked by overlapping successive courses.
- E. Broken, chipped, stained or otherwise damaged units shall not be placed in the wall unless they are repaired and the repair method and results are approved by the Engineer.
- F. All walls shall be topped with finished caps as supplied by the manufacturer of choice.
- G. NO unfinished wall block surfaces shall be visible. Where SRW blocks are freestanding, ALL visible faces shall have a finished texture.

## 3.06 GEOSYNTHETIC REINFORCEMENT PLACEMENT:

- A. All geosynthetic reinforcement shall be installed at the proper elevation and orientation as shown on the final, approved P.E. sealed retaining wall drawings, or as required by the manufacturer's Wall Design Engineer.
- B. At the elevations shown on the final plans, (after the units, drainage material, and backfill have been placed to this elevation) the geosynthetic reinforcement shall be laid horizontally on compacted infill.

- C. Geosynthetic reinforcement layers shall be one continuous piece for their entire embedment length. Overlapping of the geosynthetic in the design strength direction (perpendicular to the wall face) shall not be permitted. Along the length of the wall, horizontally adjacent sections of geosynthetic reinforcement shall be butted in a manner to assure 100 percent coverage parallel to the wall face.
- D. Tracked construction equipment shall not be operated directly on the geosynthetic reinforcement. A minimum of 6-inches of backfill is required prior to operation of tracked vehicles over the geosynthetic. Turning should be kept to a minimum. Rubber-tired equipment may pass over the geosynthetic reinforcement at slow speeds (less than 5 mph).
- E. The geosynthetic reinforcement should be installed under tension. The nominal tension shall be applied to the reinforcement and secured in place with staples, stakes or by hand tensioning until reinforcement is covered by six inches of fill.

# 3.07 DRAINAGE MATERIALS:

- A. Drainage aggregate shall be installed to the line, grades, and sections shown on the final P.E. sealed retaining wall drawings. Drainage aggregate shall be placed to the minimum thickness shown on the Contract Drawings between and behind units.
- B. Drainage collection pipes shall be installed to maintain gravity flow of water outside the reinforced soil zone. The drainage collection pipe shall daylight at an elevation lower than the lowest point of the pipe within the aggregate drain.
- C. The main collection drain pipe, just behind the block facing, shall be a minimum of 3-inches in diameter. The secondary collection drain pipes should be sloped a minimum of 2% to provide gravity flow into the main collection drain pipe. Drainage laterals shall be spaced at a maximum 50 feet spacing along the wall.

## 3.08 BACKFILL PLACEMENT:

- A. The reinforced backfill shall be placed as shown in the final, approved wall drawings in the maximum compacted lift thickness of 10-inches and shall be compacted to a minimum of 95% of standard Proctor density (ASTM D 698) at a moisture content within 2% of optimum. The backfill shall be placed and spread in such a manner as to eliminate wrinkles or movement of the geosynthetic reinforcement and the SRW units.
- B. Only hand-operated compaction equipment shall be allowed within 3 feet of the back of the wall units. Compaction within the 3 feet behind the wall units shall be

achieved by at least three (3) passes of a lightweight mechanical tamper, plate, or roller.

- C. At the end of each day's operation, the Contractor shall slope the last level of backfill away from the wall facing and reinforced backfill to direct water runoff away from the wall face.
- D. At completion of wall construction, backfill shall be placed level with final top of wall elevation. If final grading, paving, landscaping, and/or storm drainage installation adjacent to the wall is not placed immediately after wall completion, temporary grading and drainage shall be provided to ensure water runoff is not required at the wall nor allowed to collect or pond behind the wall until final construction adjacent to the wall is completed.

# 3.09 CONSTRUCTION ADJACENT TO COMPLETED WALL:

A. The Contractor is responsible for ensuring that construction adjacent to the wall does not disturb the wall or place temporary construction loads on the wall that exceed design loads, including loads such as water pressure, temporary grades, or equipment loading. Care should be taken by the Contractor to ensure water runoff is required away from the wall structure until final grading and surface drainage collection systems are completed.

# END OF SECTION

## METAL BOLLARDS

## PART I - GENERAL

## 1.01 SCOPE OF WORK

- A. The work under this Section consists of the furnishing and installation of metal bollards as shown on the drawings and as specified herein, complete with all assembly and anchoring hardware, preparation of site and footings.
- B. Bollards shall be furnished with embedment base and foundation/footing option as recommended by the manufacturer.

## 1.02 SUBMITTALS/SHOP DRAWINGS

A. Submit final shop drawings of all equipment as it is to be constructed if at variance with enclosed drawings.

## 1.03 STANDARDS/REQUIREMENTS

A. ASTM - American Society for Testing and Materials

## PART II - MATERIALS

## 2.01 METALS

A. All metal shall be steel and finished as furnished by the manufacturer.

## 2.02 ANCHOR MECHANISMS

A. Bollards shall be furnished with the embedment option and appurtenances as recommended by the manufacturer.

## 2.03 FOOTINGS

A. All footings shall be excavated in accordance with other sections of the specifications. The cement concrete for foundations shall conform to 4000 psi Cement Concrete, per Specification Section 03300. All footings shall be to the depths stated, or as directed by the Engineer to fit pavement requirements.

## 2.04 FINISH COAT

A. Bollards shall receive black powder coating finishes in conformance with the manufacturers specifications.

## 2.05 MANUFACTURED ITEMS

#### 02847-1 METAL BOLLARDS

A. All bollards under this section shall be furnished as indicated. Furnish bollards with permanent footing appurtenances. Bollards shall be:

Model R-7530-AL, Aluminum, shall be 39" high, embeded, as manufactured by Reliance Foundry, 1-877-789-3245, info@reliance-foundry.com.

Or approved equal

- B. Bollards shall be gloss black.
- B. The bollard may be custom fabricated provided that the fabrication meets all the requirements and properties of the specified product.

## PART III - EXECUTION

## 3.01 Metal Bollards

- A. Contractor shall coordinate final locations with the Town.
- B. Contractor shall excavate footings to the dimensions indicated on the contract drawings. Refer to Specification, Section 03300 Cast-In-Place Concrete.
- C. Install foundations, footings, and required appurtenances as recommended by the manufacturer to permit bollard to be embedded.

## PART IV - GUARANTEE

4.01 Guarantee all bollards and installation free from defects in materials and workmanship for one (1) year from final acceptance.

--- END OF SECTION ---

## PLAY EQUIPMENT

## PART 1 - GENERAL

#### 1.01 Description:

Furnish and deliver from the approved manufacturers listed below, all materials required to install the play equipment and structures as indicated on the drawings or as approved and specified herein.

- A. KOMPAM INC., Eric Walsh, New England Territory Manager toll free (800) 426-9788, 978-569-3797, fax (866) 943-6254.
- B. LANDSCAPE STRUCTURE INC., O'Brien & Sons, Inc., Medfield, MA 02052, toll free (800) 835-0056, voice (508) 359-4200, fax (508) 359-2817.
- C. BERLINER Selifabrick, Margie Salt at Park Street Playgrounds LLC, (978)664-0239 or (978)337-6698 263 Park St, North Reading MA 01864.
- 1.02 Submittals:

The Contractor/Manufacturer's Representative shall submit the following; play capacity of each component, scaled drawings of each specified component including dimensioned plans, 3-d color images, color charts, erection drawings, installation details, parts list, and technical data for correct assembly of all components, clamp, anchoring and hardware details.

SPECIAL NOTE: If submitting an equal manufacturer, in lieu of the specified products, the Contractor/Manufacturer's Representative shall submit a side by side comparison of the proposed play equipment illustrating how each component compares in play value, ADA access and code compliance and quality of materials and construction to the play equipment specified herein, at no extra cost to the Owner.

1.03 Warranty/Guarantee:

The Contractor/Manufacturer's Representative shall provide information on the equipment manufacturer's warranty/guarantee with bid.

1.04 Safety Guidelines and Standards:

All materials and equipment shall conform to the current issue of the "*Handbook for Public Playground Safety*" published by the Consumer Product Safety Commission (C.P.S.C.) and ASTM F1487-05. The manufacturer shall be responsible for correcting any product violations of the C.P.S.C. Guidelines and ASTM F1487-05, to the satisfaction of the Owner, should they be found after installation. ADA Accessibility Guidelines (ADAAG) Section 15.6 Play Areas.

## 1.05 Quality Assurance:

- 1. The Contractor/Manufacturer's Representative furnishing the play equipment and structures must have a minimum of 10 years of experience in the manufacturing of play equipment with the personnel, facilities, and equipment adequate for the products specified, and shall produce written proof of such.
- 2. Certification by Manufacturer that the <u>Installer</u> is an approved playground equipment installer (NPCAI certified) of the approved playground product and shall produce written proof of such.
- 3. Equipment is International Play Equipment Manufacturers Association (IPEMA) certified according to ASTMF 1487.
- 4. The Contractor/Manufacturer's Representative shall provide inspection and written report from approved Certified Playground Safety Inspector (CPSI) as verification that materials and installation conforms to item 1.04 Safety Guidelines and Standards.

# PART 2 - PRODUCTS

- 2.01 General:
  - A. Site Specificity of Design:

Equipment selection is based on specific program requirements and physical constraints within the site. Equipment must be a commercially produced product that is designed for the specific recreational purposes required by the Town as outlined in these specifications.

- a. All Composite play structures and swings shall be in-ground installation/ footings.
- b. Footing of all playground post shall be concrete, to the manufacturer's standard diameter and to a depth of 48 inches below finished grade. Top of concrete footing shall be flush with bottom of safety surfacing layer.
- c. No roof panels, talk tubes, tube/enclosed slides.
- d. Provide a choice of up to a three premium color combination for composite play equipment.
- e. Vandal Resistance due to the remote location of the playground, play equipment composed primarily of metal (i.e.: steel, stainless steel, aluminum etc.) is required.
- B. Required Submittals: (CAD drawing of playground layout is available upon request.)
  - a. Full Product Specifications.
  - b. Submit 2-D layout and 3-D color rendering with quote.
  - c. Submit guaranteed lead time for delivery and installation.

2.02 General Specification / Minimum Requirements:

#### Material:

All materials shall be structurally sound and suitable for safe play. Durability shall be ensured on all steel parts by the use of time-tested coatings such as zinc plating, zinc-nickel plating, powder coating, Tender Tuff coating, etc. Colors if applicable shall be specified.

#### Posts:

Primary posts shall be 5" O.D., with a minimum wall thickness of .120", corrosion resistant galvanized steel, due to the durability required of the product aluminum posts will not be accepted. All posts shall be powder coated in a color selected by the Owner's representative. All posts shall feature securely mounted factory installed caps.

#### Decks:

Decks shall be constructed of 11-gauge steel minimum and feature a maximum 5/16" diameter holes on the standing surface and PVC coated or approved equal. Decks shall be flush mounted to posts.

## Fasteners:

Primary fasteners shall be socketed and pinned tamperproof in design (or approved equal) stainless steel (SST) per ASTM F 879. All primary fasteners shall include a locking patch type material that will meet the minimum torque requirements of IFI-125. Manufacturer to provide a full set of the necessary tools for pinned tamperproof fasteners.

## Finishes:

Polyester (Powder) Coating - The polyester coating shall be uniformly applied by the electrostatic method to a thickness of three to five mils. Promptly after application of the powder, the coating shall be oven-cured at 400 degrees Fahrenheit. The color(s) of the polyester coating shall be as selected by the Owner.

Vinyl - The vinyl coating shall be oven-cured poly-vinyl chloride plastisol with a minimum thickness of 1/8". The coating shall contain ultraviolet inhibitors and mold resistors. The color(s) of the vinyl coating shall be as selected by the Owner.

Galvanized Finish - All components calling for a galvanized finish shall be hotdipped galvanized to the manufacturer's standard after fabrication. All galvanized surfaces shall be free of burs, splinters, and sharp edges.

## 2.03 Play Equipment

A. Play Equipment - Minimum Requirements:

In addition to the above mentioned specifications these play structure shall feature the following elements or approved elements of equal play value (individually AND in total to the play area), maximizing the available safety zone;

Manufacturer	Description
Kompan	NRO112 Forest Bug Springer
Kompan	NRO116 Forest Ant Springer
Kompan	Robinia Two-Bay Swing Set
Kompan	NRO212 Kids Table with Four Sitting Poles
Kompan	NRO 893209 3'10" H.T. Robinia Embankment Slide
Kompan	NRO409 The Wizards Hideaway
Kompan	NRO892539-2B-2I
Kompan	NRO816 Six-Sided Climbing Structure
Kompan	NRO110 Spinner Plate
Kompan	NRO854 Parkour 004
Kompan	NRO887 Single Balance Beam
Kompan	NRO3001 Double Tower with Valley Bridge
Kompan	GXY960 Galaxy

#### COMPONENTS AND MATERIALS:

Net Cables shall be constructed of six strands of galvanized steel wire, wrapped with polyester yarn with an overall diameter of 19mm. The polyester wrapping shall be inductively fused onto each strand individually for maximum durability and vandal resistance.

Edge Cables shall be constructed of six strands of galvanized steel wire, wrapped with polyester yarn with an overall diameter of 21mm, reinforced with a steel wire core. The polyester wrapping shall be inductively fused onto each strand individually for maximum durability and vandal resistance.

Post Clamps shall be constructed of cast aluminum.

Rope Clamps shall be constructed of 8mm diameter, type 4571 stainless steel.

Black Membrane shall be constructed of 8mm thick rubberized material with 4 layers of embedded woven polyester for maximum durability. Membrane shall be UV stabilized for outdoor use.

Foot Grips shall be constructed of polyurethane rubber, UV stabilized for outdoor use.

Net Spacer Bars shall be constructed of 45mm O.D. aluminum.

Fasteners shall be constructed of stainless steel.

PVC (vinyl, plastisol) shall not be present on any portion of the play equipment.

Synthetic rubber (PUR, TPE, TPU or EPDM) – Applications: Swing seats, steps and rungs on slide, binoculars, teardrops handle, hammock etc.

Members: Frameworx-steel pipes, dia. 60.3 mm (2 3/8'') with anticorrosion treatment and color finish: sandblasting and zinc-/ epoxy-/ polyester-process, incorporating an ASTEM TT net tensioning system, securely closed with durable ebonite caps. The posts shall contain an attached flange at the base for positive retention in the concrete footings.

Nodes: Frameworx-aluminum ball connectors, dia. 250mm (9-13/16'') anticorrosion treatment and color finish: sandblasting and zinc-/ epoxy-/ polyester-process; incorporating an ASTEM TT net tensioning system, securely closed with durable ebonite caps.

Ropes: U-Rope-round strand ropes with steel cores, dia. 16mm (5/8") with galvanized wires, external strands are covered with non-abrasive UV-resistant Polyamide-yarn (no Polypropylene). Maximum breaking stress 115kN.

#### Spatial netting:

Rope crossing points are localized with durable, forged aluminum-alloy cloverleaf rings and forged aluminum- alloy ballknots (no plastic connections); in situ-replaceable rope strands (no special tools required).

Mast Node:

Frameworx-aluminum ball connector, dia. 250mm (9-13/16'') anticorrosion treatment and color finish: sandblasting and zinc-/ epoxy-/ polyester-process

Steel post Jan:

Steel pipes dia. 133 mm (5  $\frac{1}{4}$ ) with a rounded cast aluminum post top, minimum wall thickness 7.1mm (1/4); anticorrosion treatment and color finish: sandblasting and zinc-/ epoxy-/polyester-process.

Terranos clamp:

Two-part cast aluminum connecting clamps for the height-adjustable connection of rope elements or steel pipes to Terranos steel posts.

## Ropes:

U-Rope-round strand ropes with steel cores, dia. 16mm (5/8'') – unless otherwise noted; external strands are covered with non-abrasive UV-resistant Polyamide-yarn (no Polypropylene!).

## Planar netting:

Rope crossing points localized by durable, drop forged aluminum-ballknots (no plastic).

Frox-ropes connections:

All connections for Terranos-rope elements in Terranos-grid dimension 3000mm (standard linear dimension; 9'- 10 1/8'') or 4243mm (diagonal dimension; 13'- 11-1/16'') are equipped with Frox- Rope connections that are completely enclosed and free from any entrapment risks.

GXY916 - Shall be a rotating play event oriented at an approximate 10 degree angle from horizontal. In lieu of a full platform, there shall be a circular ring, which children can sit or stand upon. The product can either be operated by users sitting on the ring while another person rotates the ring or by all children standing and moving relative to the ring. As the children move about the ring and move closer together or further apart, the ring will rotate in response such that the rotational speed and direction is controlled by all of the children working together to coordinate their movements.

## Wood

Wood shall be from FSC-certified sources, and avoid suppliers who provide wood from questionable/controversial sources. Pinewood is either from Northern or Central Europe and hardwood is from either South America or Africa.

Posts, crossbars and other un-fabricated parts shall be made from de-barked and sap free Robinia wood trunks in various dimensions. Wood Components shall show a low degree of visual fabrication allowing for a natural look letting posts bend and wind in some degree. Basic lines shall be cut to meet safety requirements of EN1176. Climbing walls shall be made of Robinia wood or weather-resistant plywood coated with anti-slip film on both sides.

Wooden panels are to be made of pressure-impregnated class IV pine 27 x 130 mm, with stainless steel screws built onto the metal framework to which they transmit force.

Pressure impregnated pine (Pinus Sylvestris) shall be carefully processed to ensure smooth surfaces and edges. The pine wood shall be Quinta or US sorted and all planning etc. shall be done prior to impregnation.

Pine posts shall be installed with steel footings and impregnated after class AB. In case the pine wood posts are installed in contact with ground or fresh water, the posts shall be impregnated after class A. Pressure impregnation shall be done with Tanalith E 3492. Certified pine wood shall be FSC certified products with FSC labels.

Metal

Slides, banister bars, Curly climbers, handles on Monkey bar, fireman's poles, sand strainers, water vats, spacers, chains, tubes and handles and footrest on springers shall be made from stainless steel. Brackets, net beams, Track ride and chains shall be hot dip galvanized steel tested for compliance with US CPSIA requirements regarding lead content as well as the European Standard EN 71-3 regarding migration of unwanted substances.

Springs shall be made of steel qualities that meet EN 10270-1. The springs shall be subjected to shot peening to prevent crack formation and fatigue fracture. Spring durability and expected life in use shall have been tested on a sampling basis to ascertain that the spring will function after more than 5 years of normal use. Springs shall be fitted with anti-pinch clamps of injection molded nylon or approved alternate.

## Rope

Nets and ropes shall be made of PA with inner galvanized steel reinforcement. The rope shall be induction treated in order to create a strong connection between steel and rope and excellent wear resistance. The net connectors are shall be made from injection-molded PA (polyamide) or approved equal in order to perform the maximum strength and UV stability. Nets and ropes shall be equipped with stainless steel chains at ends for adjustment due to variation in Robinia dimensions.

## Plastic

## **Injection Molded Plastics**

Plastics shall be selected for suitability, strength and environmental properties. The plastic components shall be identified by means of international standard abbreviations, allowing optimum recycling. All plastic components shall retain their properties in the temperature range of -30°C to 60°C. All plastic materials shall be UV and ozone protected to the maximum within the frames of the strongest environmental demands. Only plastic materials and additives in compliance with EN 71-3 shall be used.

Panels for decoration and attachment of slides shall be made of 19mm EcoCoreTM or approved equally durable, ecofriendly material, with core material produced from 100% recycled material. The core shall have a thickness of 15mm (minimum) and shall represent 80% of the total material.

High-pressure laminate panels (HPL) shall be 10 or 18 mm thick with a molded-

on non-skid surfaces and used for platforms, steps, seats and other places exposed to extensive wear.

Net connectors, tube connector and Do-nuts shall be injection-molded PA (polyamide). Slides, sand shovel and plugs for posts are molded in PE.

Swing seats, spring inserts, absorber for seesaws and manipulative items shall be made from synthetic rubber (PUR and TPE). Swing seats shall meet the impact criteria of EN1176 as well as ASTM F 1487.

Metal components

Steel components shall be manufactured from:

- Carbon steel with hot-dip galvanized surface according to ISO1461.
- Stainless steel AISI304 or AISI303
- Carbon steel with powder coating corrosion class C4 according to ISO12944-2
- Hot-dip galvanized steel with powder coating.

Lead content for surfaces shall be below 90ppm. Lead content for base material shall be below 100ppm.

Bolts, nuts etc. may have a Delta-Magni surface treatment.

Poles shall be made of hot-dip galvanized steel  $\emptyset$ 101.6 x 2.9 mm to ensure the strength of constellations. Poles shall be supported by specially welded triangle top frames of hot-dip galvanized steel  $\emptyset$ 38 x 4 mm. Top protection on poles shall be a core of polyamide (PA) covered with a soft black thermoplastic rubber (TPE) surface.

Posts and Frames of steel shall be hot-dip galvanized tubes in dimensions  $\emptyset$ 101.6 x 2.9 mm,  $\emptyset$ 42.4 x 3.2 mm and frames/posts are  $\emptyset$ 38 x 2 mm. Post size varies, refer to manufacturers recommendations.

Core platform posts:

Steel posts of Ø101,6x2,0mm pre-galvanized steel tube with powder coated top finish.

Aluminum posts of Ø102,3x3,8mm with color anodized top finish.

Crossbars, support legs, pipes etc. are made of hot-dip galvanized steel tubes Ø

#### 02886-8 PLAY EQUIPMENT

60.3 x 4.5 mm and Ø38 x 4 mm.

Aluminum components:

Various primary connectors, ball joints, ferrule joints and force fit bracket connectors for net and foundation supports are made of die-cast aluminium specially alloyed for outdoor environments and with a lead content below 100ppm.

Basketball goals shall be made of powder coated hot-dip galvanized steel with alternative choice of net:

Net shall be made of polyamide (PA). Net made of PA reinforced with a steel wire inside. Stainless steel chains which meet the requirements in ISO1434 –ISO1435 and DIN766.

Multifunction posts shall be hot-dip galvanized Ø101mm. The two posts are placed outside the play area and have a central net with different heights for e.g. tennis, badminton and volleyball. The tensioning mechanism of the central net is vandal-proof.

All the metal-to-metal contacts shall be cushioned with neoprene anti-noise and anti-vibration joints. Regular provision of openings in the gripping cross sections allows surface water to run off due to the slope. The density of the posts contributes to the strength of the assembly. The presence of several welded-on support brackets allows the flexible HDPE panels to agitate so that the framework absorbs all the shocks received without creating vibrations to the structure.

## 2.04 Additional Hardware:

Additional hardware shall be provided in sufficient quantity to complete the assembly of the play equipment. All hardware shall be stainless steel or non-ferrous. Bidder shall provide the owner with any and all maintenance and repair supplies, installation manuals, tool kits and materials that were shipped with each product for the Owner's Inventory.

## 2.05 REFERENCE STANDARDS AND SPECIFICATIONS

a. Playground equipment design, layout, and installation shall comply with the following standards and guidelines as applicable.

- 1. CPSC Consumer Product Safety Commission Guidelines for Playground Safety, latest edition.
- 2. ASTM American Society for Testing and Materials, Designation: F 1487, Standard Consumer Safety Performance Specification for Playground Equipment for Public Use, latest edition.
- 3. ANSI American National Standards Institute.
- 4. MAAB Massachusetts Architectural Access Board
- 5. International Playground Equipment Manufacturers Association (IPEMA)
- 6. International Playground Contractors Association (NPCAI)
- 7. National Recreation and Parks Association (NRPA)
- b. Requirements not specifically set forth herein, but required by the agencies listed in above shall be understood to be a requirement of this contract since these standards of quality and safety are established as the industry standard(s). Any conflicts between the agency standards and the contract documents shall be brought to the attention of the Engineer, and unless otherwise directed in writing, the agency standards shall be the minimum requirement to be followed.

# END OF SECTION

## POURED-IN-PLACE SAFETY SURFACING

## PART I - GENERAL

## 1.01 SCOPE OF WORK:

**a.** The Contractor shall furnish all labor, materials, equipment and transportation required for the placement of poured-in-place play surfacing at children's play area. The surfacing shall be placed at all locations identified on the Contract Drawings to the indicated grades. Layout and design of color and pattern is to be installed per the contract drawings.

#### 1.02 SUBMITTALS:

- a. In accordance with the SUBMITTAL section of these specifications submit manufacturer's specification and detail sheets for all materials to be utilized under this section.
- b. Field layout of color and pattern of surfacing to be approved by Landscape Architect prior to installation.
- c. Provide samples as directed by the Engineer.
- d. Post installation testing will be required by the Owner at the Contractors expense. An independent testing agency shall test to ensure a HIC of 800, contractor is responsible for removal and reinstallation if the test results do not conform.

#### 1.03 QUALIFICATIONS:

a. For installation of the poured-in-place play surface the contractor shall have a minimum of five (5) years experience provide evidence of successful completion of twenty-five (25) like surfaces installed during the past five (5) years with names of clients and phone numbers.

## PART II - MATERIALS

## 2.01 POURED-IN-PLACE-PLAY SURFACE:

a. Poured-in-place play surface shall be "Playbound" by Surface America, GT-Max
 Poured by Gametime Inc. or products supplied by VitriTurf of Bohemia, NY
 631.231.1300 or approved equal. The City will consider "Sprinkle Flex" from

## 02887-1 RUBBER SAFETY SURFACING

VitriTurf but this request MUST be made during the bid period so that appropriate unit pricing can be established.

Play surface shall meet or exceed current Consumer Product Safety Commission (CPSC) guidelines issued in 'A Handbook for Public Playground Safety' (latest edition) for the minimum potential fall height of the play equipment, current Disabilities Act Guidelines (ADA) and current American Society for Testing Materials (ASTM) F-1292-91 requirements.

- 1. The <u>Base Mat</u> shall be a monolithic poured-in-place cushioned pad, made from a blend of recycled styrene butyrene rubber (SBR) and a polyurethane binder or approved equal. The depth of the SBR mat shall be such that in conjunction with the specified top-wearing course the total resilient surface system shall provide the required absorbency for the maximum potential fall from the specified play equipment. (Refer to Section 02886) SBR shall be mixed with the binder in a ratio of 88% SBR to 12% binder by weight to achieve maximum resilience.
- 2. The <u>Top Surface</u> shall be a monolithic poured-in-place top surface, <sup>1</sup>/<sub>2</sub>" total thickness, made from a blend of ethylene propylene diene monomer (EPDM) colored rubber particles there will be up to <u>FOUR separate colors</u> and each shall include a custom combination of four colors with NO <u>BLACK</u> to be chosen by the owner's representative during the submittal process combinations indicated in manufacturer's brochures. Top surface shall have a tensile strength of two hundred (200) psi. The urethane binder shall be an aliphatic non-yellowing type.
- 3. Poured-in-place surfacing shall be placed throughout the full extent of the two playlots. The total depth of poured-in-place surfacing shall sufficient to meet a HIC of 800 at installation based on maximum fall height of play structure indicate on the plans and specifications.
- 4. Prefabricated shock pads will not be considered equal.

## 2.04 BASE MATERIALS:

a. Crushed stone materials shall be as specified under Section 02350 of these Specifications, or as otherwise indicated on the details.

## PART III - EXECUTION

### 3.01 PROCEDURES:

- a. The Contractor shall deliver, spread and compact or place safety surfaces to conform to the lines and grades shown on the Contract Drawings. All work shall be done in accordance with the manufacturer's installation recommendations for wood mulch or Poured-in-Place Play Surfaces.
- b. The Base Mat for the Poured-in-Place Play Surface shall be installed in accordance with the manufacturer's instructions. The Base Mat shall exhibit a minimum installed thickness necessary to provide the required absorbency for the maximum potential fall from the proposed play equipment. At playlot edges, place a board between the end of the poured-in-place base pour and the concrete edge and remove the board after the base has sufficiently cured. Pour the top course of poured-in-place surfacing and allow material to fill the void created by the board.
- c. The Top Surface shall be installed following installation of the cushion course, in accordance with the manufacturer's instructions. The minimum installed thickness of the top wearing course shall be  $\frac{1}{2}$ ". The contractor is responsible for insuring that no foot traffic is allowed on the surface before the curing is complete.
- d. Any tests of materials, and/or compaction shall be as ordered by the Engineer and paid for by the Contractor regardless of results.
- e. <u>WARRANTY</u>: Safety surfacing shall be free of defects due to workmanship or material for a minimum of two (2) years from date of installation.

- - END OF SECTION - - -

#### SECTION 02911

### ROOT ZONE MIX PREPARATION & BLECAVATION

#### PART I - GENERAL

#### 1.01 SCOPE OF WORK

- A. Under this Section, the Contractor shall furnish all labor, materials, equipment (including low ground pressure, LGP, equipment) and transportation required to furnish and place, or prepare Root Zone Mix for the field and to perform 'blecavation' operations for the areas shown on the drawings and as specified as "full depth renovation". Refer to Appendix A for acceptable equipment.
- B. Prospective bidders are advised that significant quantities of topsoil are present at the property and presumably available for reuse if compatible with the requirements of this specification. The Contractor shall be responsible for amending topsoil, as required to comply with this specification and SECTION 02910 SCREENED LOAM BORROW AND TOPSOIL RE-USED.
- C. This work shall consist of preparing a root zone mixture consisting of screened native on site loam, sand and compost and performing blecavation as described in item 'd' below. The root zone mix will be evaluated by using the ASTM test methods for High Performance Sand-based Root Zones for Sports Fields, ASTM F 2396-04 as shown in Appendix A. A sand sample and compost sample shall be submitted to a testing agent for adherence to specifications prior to blending operations. Through the blecavation process that uses the blecavator machine set to varying height controls, the compost and sand can also be blended with top soil on-site to a desired depth of 8" at the construction site.
- D. The contractor shall perform blecavation operations within the areas delineated on the plans. The contractor shall prepare the soil using the blecavator, which is a heavy duty contra-rotating rotor with blades that dig into the ground throwing soil, debris, and rocks against a sorting screen mounted behind the rotor for separating rocks and debris. The fine soil is deposited over the top and leveled off. The rear packer roll on the blecavator firms up the finished areas ready for seeding. Within the area delineated on plans, the contractor shall be directed by the owner or Engineer, to perform blecavation for 8" depths of spread topsoil, in order to achieve a homogeneous blend of top soil composition over the entire field within the limits of the full depth renovation areas.
- E. The contractor shall have the option, at their discretion, to remove all existing loam from the field or stockpile and either mix on site or bring in Root Zone Mix that adheres to this specification.

F. No heavy duty equipment and vehicular traffic shall be allowed on the prepared areas.

## 1.02 SAMPLES/TESTS

- A. The Contractor shall furnish an outline of their approach to the project no less than ten (5) days prior to the start of construction.
- B. The Contractor shall furnish a Certified Laboratory Report showing the soils classification and nutrient analysis of representative samples of the Loam, sand and compost that is proposed to be used, including the extent of lime and fertilizer required. Samples submitted for approval must be representative of the total volume to be furnished, taken in the presence of the Engineer, and delivered to a certified laboratory by the Contractor; all costs for such shall be borne by the Contractor.
- C. If the material does not conform to the above requirements it shall be rejected and additional sources shall be found. Sampling and testing shall be accomplished as specified herein until an approved material is found, all at the Contractor's expense.
- D. To assure that materials fulfill specified requirements regarding textural analysis, organic matter content, pH, and fertility, depending on the approach, testing may be undertaken:
  - 1. Prior to site delivery; at source;
  - 2. At time of delivery; on-site
- E. For quality control, immediately following spreading on site, soil may be tested at the owner's discretion. Soil sampling shall also indicate if specified soil was supplied <u>uniformly</u> to the minimum specified depth.

## 1.03 RELATED WORK:

- A. Section 02329 LOAM BORROW
- B. Section 02290 SEEDING
- C. Section 02810, IRRIGATION

## 1.04 STANDARDS

A. ASTM - American Society for Testing and Materials.

## 1.05 NOTIFICATION

A. The Contractor shall notify the Owner in writing at least ten (10) days in advance of the time he intends furnishing Root Zone Mix or amendments stating the location and amount of such deposit, the name and address of the supplier and also shall furnish such facilities, transportation and assistance as the Owner may require for collecting and forwarding samples.

## 1.06 QUALITY CONTROL

- A. Root zone mix: A one gallon sample for every 2,000 cubic yards of root zone mix shall be tested by the Owner's Testing Agent for approval. All costs shall be done by the Contractor.
- B. Following installation of irrigation system and prior to seeding, contractor shall notify the Engineer or owner and provide the owner with compaction tests along the center line of the field as well as along the side lines to ensure that the root zone mix has not been heavily compacted. Compaction test shall fall within the industry standards for fields and any areas of the field that exceed these standards shall be corrected at the contractor's expense prior to seeding.
- C. The Contractor or Sub-contractor must have a minimum of five (5) years of experience installing root zone mix based athletic fields of similar size and quality of this project.

## PART II - MATERIALS

### 2.01 LOAM BORROW

A. Refer to Section 02910, SCREENED LOAM BORROW & TOPSOIL RE-USED.

### 2.02 SAND

A. Sand for Root Zone Mix shall conform to ASTM standard F 2396-04 Sand for High Performance Sand-based root zones for Sports Fields or 2mm USGA specification sand for golf course fairway top dressing.

## 2.03 PEAT OR ORGANIC MATERIAL

A. Peat moss shall be of a standard brand free of sticks, stones, hay or any other deleterious Matt and meet the following requirements:

Parameter Total Ash	Specification 15% or less
PH	6.5 to 7.5
% Moisture	30% to 50%
Sieve Criteria	
2.0 mm sieve	0-5% retained
1.0 mm sieve	Less than 20% retained

B. Compost - Compost shall be derived from organic wastes including sawdust, clean ground wood and biosolids that meet all State Environmental Agency requirements. The product shall be well composted, free of viable weed seeds and contain material of a generally humus nature capable of sustaining growth of vegetation, with no materials toxic to plant growth. Leaf compost shall not be accepted.

Compost shall have the following properties:

Parameters	Range
pH	6.5 – 7.5
Moisture content	35% - 55%
Soluble Salts	< 4.0 mmhos (dS)
C:N ratio	15 - 30:1
Particle Size	< 1/2"
Organic Matter Content	>40%
Bulk Density	< 1000 lbs./cubic yard
Foreign Matter	< 1% (dry weight)
Total Ash	15% or less

Compost generator shall also provide minimum available nitrogen and other macro and micro nutrients to determine fertilizer requirements. Generator shall supply documentation showing state approval for intended use.

C. Fertilizer - Renovate Plus, 3-3-3. Refer to Appendix A.

## 2.04 ROOT ZONE MIX

- A. Mixing Materials: Mixing of the sand, peat and soil mixture for the root zone mix must be blended by an experienced blending operator.
- B. Physical performance Evaluation of the root zone mix will be in accordance with the guidelines set forth in ASTM standard F 2396-04.

## PART III EXECUTION

## 3.01 ROOT ZONE MIX RATIOS

compost by volume.

A. Upon approval of the loam borrow, sand and compost components, the owners testing agents shall blend the components to determine the correct ratio of sand and compost to create the root zone mix. This ratio of sand and compost will be based on laboratory testing and performance guidelines established by these specifications.

Based on previous testing and for bidding purposes, the field root zone mix ratio will contain 35% sand, 60% Native Screened Loam and 5% compost by volume. This is 3" of Sand/Compost mix uniformly distributed by a top-dresser on top of 5" of spread screened native loam prior to blecavation. The lateral drain (2"slit drains) backfill mix ratio will contain 90% sand, and 10%

B. The root zone mix developed by the owners testing agent will establish the required mix ratio and specifications for approval or rejections of all quality control submittals during construction.

*Performance Testing:* ASTM testing procedures for sand based athletic fields shall be used for performance testing.

### 3.01 PLACEMENT

Root zone Mix Established by the Blecavation method:

- A. The Contractor shall furnish and spread the required depth 90/10 blend ASTM spec sand and ASTM F2396-04 spec compost amendments, distributed by a top-dresser for uniformity.
- B. All sport turf areas are to be tilled to a depth of 8" with a blecavator, conventional tilling is unacceptable. This depth includes the 2"-3.5" of ASTM spec sand as indicated above.
- C. Fine grading shall be accomplished with a fully automated dual plain LGP laser grader.
- D. Under no circumstances will loaded rubber tired vehicles in excess of 1 ton be allowed on the gravel base or root zone mix prior to, during or after the spreading of the root zone mix.
- E. Finish grades shall be verified by the Contractor using laser operation survey instruments with a tolerance of  $+/- \frac{1}{4}$  inch.

New or Blended Root zone Mix:

- F. The Contractor shall furnish and spread Root Zone Mix to the depths shown on the contract drawings, which depth shall be the minimum required depth after settlement. No compaction shall be required beyond that extent necessary to place sod or for the establishment of seed.
- G. Root Zone Mix shall be spread in such a manner as to establish a loose, friable seedbed.
- H. Under no circumstances will loaded rubber tired vehicles in excess of 1 ton be allowed on the gravel base prior to or during the spreading of the root zone mix.
- I. Finish grades shall be verified by the Contractor using laser operation survey instruments with a tolerance of  $+/-\frac{1}{4}$  inch.

## 3.02 ADDITIVES

A. The Contractor shall apply all necessary fertilizer and lime to the soil in accordance with the manufacturer's and laboratory's recommendations and as required by the sodding, seeding specifications referenced elsewhere.

## END OF SECTION

### SECTION 02930

### TREES, SHRUBS, GROUNDCOVERS, AND LANDSCAPING

### PART 1 - GENERAL

#### 1.01 WORK INCLUDED:

- A. This Section includes furnishing all labor, materials, equipment, plants, and incidental materials necessary to perform all operations related to the planting of all trees, shrubs vines, herbaceous plants, ground covers, and for all appurtenant work, complete in place, maintained, and accepted, in accordance with the Contract Drawings and Specifications.
- B. The Contractor shall bear the responsibility and cost of furnishing and applying water or any other substances, as necessary to ensure the sustainability of plant materials, as part of the work of this contract.
- 1.02 RELATED WORK:
  - A. Section 02329, LOAM BORROW
  - B. Section 02920, SEEDING
  - C. Section 02923, SODDING
- 1.03 SUBMITTALS:

In accordance with requirements of the general specifications, the Contractor shall submit the following:

- A. Prior to planting, State nursery inspection certificates for all plant materials shall be submitted to the Engineer for review.
- B. Samples and six copies of the manufacturer's product data, as applicable, shall be submitted to the Engineer for review and approval for the following materials:
  - 1. Limestone.
  - 2. Fertilizer.
  - 3. Sphagnum Peat Moss.
  - 4. Humus.
  - 5. Organic Compost.
  - 6. Manure.

- 7. Mulch.
- 8. Guying and Staking Apparatus.
- 9. Crepe Wrapping for tree trunks.
- 10. Anti-transpirant/Anti-desiccant.
- 11. Insecticides.
- 12. Herbicides.
- 13. Fungicides.

## PART 2 - PRODUCTS

## 2.01 PLANT MATERIALS:

- A. The Contractor shall furnish and plant all plant materials as shown on the plans and in the quantities and sizes listed thereon. No substitutions shall be permitted without the written approval of the Engineer.
- B. Plants larger than those specified in the Plant List may be used if approved by the Engineer. However, use of such oversized plants shall not be considered grounds for any increase in the contract price. If the use of larger plants is approved, the required spread of roots or ball of earth shall be increased in proportion to the size of the plant and plant pits shall be increased as necessary.
- C. All plants shall be certified to have passed all required Federal and State inspection laws requiring ensuring freedom from plant diseases and insect infestations. The Contractor shall obtain clearance from applicable governing agencies, as required by law, before planting any plants delivered from outside the state in which they are to be planted.
- D. All plants shall be nursery-grown under climatic conditions and environmental stresses similar to those in the locality of the project. All plants shall originate from nurseries that are no more than one Hardiness Zone higher (as established by the Arnold Arboretum, Jamaica Plain, MA) than where the plant is to be installed. Plants also shall conform to the botanical names and standards of size, culture, and quality for the highest grades and standards as adopted by the American Association of Nurserymen, Inc. in the <u>American Standard for Nursery Stock, ANSI-Z60.1</u>, latest edition. All plants shall be legibly tagged with their proper botanical name.
- E. No heeled-in plants or plants from cold storage shall be used. All plants shall be typical of their species or variety and shall have a normal habit of growth. Plants shall be sound, healthy, and vigorous, well branched and densely foliated when in leaf; shall be free of

disease, insects, eggs or larvae; and shall have healthy, well-developed root systems. All parts of the plant shall be moist and shall show active green cambium when cut.

- F. All nursery plants shall be balled and burlapped or container-grown and shall have been acclimatized for at least one growing season. Container-grown stock shall have been grown in a container long enough for the root system to have developed sufficiently to hold its soil together, firm and whole, after removal from the container. No plants shall be loose in the container. Container-grown plants shall have no girdling roots and shall not be in a root-bound condition. Plants shall remain in their container until planted.
- G. Care shall be exercised in digging and preparing field-grown plants for shipment and planting. Balled and burlapped materials shall have solid unbroken balls of earth of sufficient size to encompass all fibrous feeding roots necessary to ensure successful recovery and development of the plants. Balls shall be firmly wrapped in untreated biodegradable burlap and tied securely with wire cages and/or jute twine. Roots or balls of plants shall be adequately protected at all times from sun and drying winds. No plant shall be accepted when the ball of earth surrounding its roots has been badly cracked or broken preparatory to or during planting, or after the burlap, staves, wire cage, rope, or platform in connection with its transplanting have been removed. Soil characteristics (i.e., composition, texture, pH, etc.) of all field-grown plants shall closely match those of the soil where plant materials are to be planted.
- H. The height of the trees, measured from the crown of the roots to the top of the top branch, shall not be less than the minimum size designated in the Plant List in the Drawings. The branching height for deciduous trees installed adjacent to or within walks shall be 7 feet minimum, having been pruned to this height at least 1 year prior to transplanting. Except when a clump is designated, the trunk of each tree shall be a single trunk growing from a single, unmutilated crown of roots. No part of the trunk shall be free from sunscald, frost cracks, or wounds resulting from abrasions, fire, or other causes. All pruning cuts shall comply with acceptable horticultural practices. No pruning wounds having a diameter of more than 1½-inches shall be present. Any such wounds must show vigorous bark growth on all edges. Evergreen trees shall be branched to within 1 foot of the ground. No tree that has had its leader cut or die shall be accepted.
- I. Caliper measurements for tree trunks shall be taken 6-inches above ground for trees up to and including 4-inch caliper size and at 12-inches above ground for larger sizes.
- J. Shrubs shall meet the requirements for spread and/or height stated in the Plant List on the Drawings. The measures for height are to be taken from the crown or root flare to the average height of the top of the shrub mass (not the longest branch). The fullness of each shrub shall correspond to the trade classification "No. 1". Single stemmed or thin plants will not be accepted. The side branches must be generous, well-twigged and the plant as

a whole must be well-bushed to the ground. The plants must be in a moist, vigorous condition, free from dead wood, bruises or other root or branch injuries.

- K. Herbaceous plants, vines and groundcovers shall be of the size, age and/or condition designated in the Plant List on the Drawings.
- L. Plants shall be delivered only after preparations for planting have been completed. Plants shall be handled and packed in a horticulturally approved manner and all necessary precautions shall be taken to ensure that plants arrive on-site in a healthy vigorous condition. Trucks used for transporting plants shall be equipped with covers to protect plants from windburn, desiccation, and overheating during transport. Plants that have not been thoroughly watered shall not be accepted at the planting site. Any plants delivered to the site in a dry or wilted condition shall be rejected and replaced at no expense to the Owner. All plant materials shall be protected, watered and otherwise maintained prior to, during, and upon delivery to the site.
- M. Plants shall be subject to inspection and approval by the Engineer at the place of growth, or upon delivery, for conformity to specification requirements as to quality, size, variety, and condition. Inspection and selection of plants before digging shall be at the option of the Engineer. The Contractor, or his representative, shall be present, if requested by the Engineer, for inspection of plants at the Nursery. Such approval shall not impair the right of inspection and rejection upon delivery at the site or during the progress of work, for size and condition of balls and roots, disease, insects and latent defects or injuries. Rejected plants shall be removed immediately from the site. Certificates of inspection of plant materials shall be furnished as may be required by Federal, State and other authorities to accompany shipments.

## 2.02 LOAM BORROW:

Loam Borrow shall be as specified in Section 02329, LOAM BORROW.

## 2.03 SOIL ADDITIVES AND AMENDMENTS:

A. LIMESTONE:

Lime shall be an approved agricultural limestone containing at least 50 percent total oxides (calcium oxide and magnesium oxide). The material will be ground such that 50 percent of the material will pass through a No. 100 mesh sieve and 98 percent will pass a No. 2 mesh sieve. Lime shall be uniform in composition, dry and free-flowing and shall be delivered to the site in the original sealed containers, each bearing the manufacturer's guaranteed analysis.

### B. FERTILIZER:

1. Fertilizer shall be a complete, standard commercial fertilizer, homogeneous and uniform in composition, dry and free-flowing, and shall be delivered to the site in

the manufacturer's original sealed containers, each bearing the manufacturer's guaranteed analysis and marketed in compliance with State and Federal Laws. All fertilizer shall be used in accordance with the manufacturer's recommendations.

2. Fertilizer for tree, shrub and groundcover plantings shall contain all major plant nutrients and minor trace elements essential to sustain plant growth and shall have the following analysis:

Nitrogen (N)Phosphorous (P)Potassium (K)10%10%10%

- 3. As approved by the Engineer, a slow release root contact fertilizer installed at the time of planting, may be used in place of the above, at the discretion of the Contractor.
- C. Organic Compost shall be a standard commercial product comprised of fully decomposed, 100 percent plant-derived, natural organic matter. Its composition shall furnish ample water holding capacity and cation exchange capacity for the retention of plant nutrients. Compost shall be free of sticks, stones, weed seeds, roots, mineral or other foreign matter and delivered air dry. It shall be free from excessive soluble salts, heavy metals, phytotoxic compounds, and/or substances harmful to plant growth and viability. Organic compost shall have an acidity range of 4.5 to 7.0 pH.
- D. Sphagnum Peat Moss shall be a standard commercial product. Its composition shall furnish ample water holding capacity and cation exchange capacity for the retention of plant nutrients. Peat moss shall be free of sticks, stones, weeds or weed seeds, roots, mineral or other foreign matter. It shall be free from toxic substances and/or compounds harmful to plant growth and viability. It shall be delivered air dry in standard bales and shall have an acidity range of 3.5 to 5.5 pH.
- E. Humus shall be natural humus, reed peat, or sedge peat. Its composition shall furnish ample water holding capacity and cation exchange capacity for the retention of plant nutrients. Humus shall be free of sticks, stones, weeds, roots, mineral or other foreign matter and/or toxic substances harmful to plant growth and viability. It shall be low in wood content, free from hard lumps and excessive amounts of zinc and delivered air dry in a shredded or granular form. The acidity range for humus shall be 5.5 to 7.5 pH, and the organic matter content shall be not less than 85 percent, as determined by loss on ignition. The minimum water holding capacity shall be 200 percent by weight on an ovendry basis.
- F. Manure shall be well-rotted, leached, cow manure not less than 8 months or more than 2 years old. It shall be free of sawdust, shavings, or refuse of any kind and shall not contain more than 25 percent straw. It shall contain no substances harmful to plant growth. The

Contractor shall furnish information regarding chemical disinfectants, if any, that may have been used in storage of the manure.

### 2.04 PLANTING MIXTURE:

Planting mix shall consist of 7 parts loam borrow and 1 part organic compost, humus, sphagnum peat moss, or manure, thoroughly blended.

#### 2.05 WATER:

Water shall be furnished by the Contractor, unless otherwise specified, and shall be suitable for irrigation and free from ingredients harmful to plant growth and viability. The delivery and distribution equipment required for the application of water shall be furnished by the Contractor, at no additional cost to the Owner.

#### 2.06 MULCH:

Mulch shall be fibrous pliable shredded softbark mulch, not exceeding <sup>1</sup>/<sub>2</sub>-inch in width. It shall be 98 percent organic matter with a pH range between 3.5 and 4.5 and a moisture content not to exceed 35 percent. It shall be free of weeds, weed seeds, debris, and other materials harmful to plant growth and viability. Organic mulch shall be aged no longer than 2 years.

### 2.07 MATERIALS FOR STAKING, GUYING, AND WRAPPING:

- A. Tree stakes shall be sound, untreated 2 x 3 (nominal) x 8-foot length Douglas Fir reasonably free of knots. No paint or stain shall be used in conjunction with tree stakes. Tying material shall be flexible braided nylon webbing, <sup>3</sup>/<sub>4</sub>-inch wide and have a tensile strength of 900 pounds. Webbing shall be 'ArborTie', or approved equal.
- B. Drive anchors and guy wire assemblies shall be suitable for protecting trees and shall be sized in accordance with the manufacturer's recommendations. No materials shall be used for guying that will girdle, chafe, or otherwise injure trees.
- C. Tree wrap shall be duplex, waterproof kraft paper crinkled to 33-1/3 percent stretch, 4to 6-inch wide strips. Tying materials shall be jute twine, 2-ply for shrubs and trees less than 3-inch caliper; 3-ply for larger plants.

### 2.08 TREE PAINT:

Tree paint shall not be used.

## 2.09 ANTI-TRANSPIRANT/ANTI-DESICCANT:

Anti-transpirant or anti-desiccant shall be 'Wilt-Pruf', as manufactured by Nursery Specialty Products, Inc., Groton Falls, NY, or approved equal. It shall be delivered in

original sealed manufacturer's containers and used in accordance with the manufacturer's instructions.

- 2.10 INSECTICIDES:
  - A. No insecticides shall be used on-site without the Contractor notifying and obtaining the prior approval of the Engineer.
  - B. Insecticides shall be EPA registered and approved for use in public open spaces. All insecticides shall be handled by State licensed applicators only, delivered in the original sealed manufacturer's containers, and used in accordance with the manufacturer's instructions.
  - C. Insecticide use shall be limited and selective, only to control specific insect infestations, as identified by the Contractor or the Owner's Representative, that may result in the disfigurement, decline, or death of plant materials.

## 2.11 HERBICIDES:

- A. No herbicides shall be used on-site without the Contractor notifying and obtaining prior approval of the Engineer.
- B. Herbicides shall be EPA registered and approved for use in public open spaces. All herbicide shall be handled by State licensed applicators only, delivered in the original sealed manufacturer's containers, and used in accordance with the manufacturer's instructions.
- C. Herbicide for post-emergent application shall be glyphosate contact, 'Roundup', as manufactured by Monsanto, Inc., or approved equal.
- D. Herbicide use shall be limited and selective, only to control specific weed infestations that have been identified by the Contractor or the Owner's Representative.

### 2.12 FUNGICIDES:

- A. No fungicides shall be used on-site without the Contractor notifying and obtaining prior approval of the Engineer.
- B. Fungicides shall be EPA registered and approved for use in public open spaces. All fungicides shall be handled by State licensed applicators only, delivered in the original

sealed manufacturer's containers, and used in accordance with the manufacturer's instructions.

C. Fungicide use shall be limited and selective, only to control specific fungal pathogenic disease infestations, as identified by the Contractor or the Owner's Representative, that may result in the disfigurement, decline, or death of plant materials.

## PART 3 - EXECUTION

## 3.01 INSTALLATION:

- A. All plants shall be subject to inspection and approval by the Engineer upon delivery to the site. No materials shall be planted until approval is received.
- B. All work shall be performed by skilled workers with a minimum of 2 years planting experience, in accordance with accepted horticultural/nursery practices, under the full-time supervision of a Certified Nurseryman or Arborist.
- C. All balled and burlapped plants that cannot be planted immediately upon delivery shall be set on the ground and the root balls shall be well protected with soil, wet moss, or other acceptable material. All foliage shall be protected and covered with perforated shade materials.
- D. The planting season for evergreen trees and shrubs shall extend from the time the soil becomes workable in the spring until new growth appears, and from September 15 until November 30 in the fall. Deciduous trees and shrubs shall be planted only when dormant, either prior to bud break and/or before leaves appear in the spring, or subsequent to their leaf drop in the fall. Ground covers shall be planted only after the last frost in the spring through mid-May. Planting season periods may be extended if weather and soil conditions permit only with the written approval of the Engineer. Extended or out-of-season planting requirements shall include application of antitranspirant and extra water as needed. Plant guarantee periods shall remain as stated below. Planting shall not be permitted in frozen ground.
- E. All plant locations and outlines for planting beds shall be staked out for review and potential adjustment by the Engineer before any excavation is begun. In the event that rock, underground construction work or obstructions are encountered in any proposed planting pit or bed, the Engineer may select alternate locations. Where locations cannot be changed, the obstruction shall be removed, subject to the Engineer's approval, to a depth of not less than 3 feet below grade and not less than 6-inches below the bottom of the root ball when plant is properly set at the required grade. Removal of boulders or obstructions greater than 1 cubic yard in size shall be subject to approval and will be paid for by the Owner. No ledge will be removed to create planting pits or beds
- F. All planting pits shall be excavated with sloped walls, wider at the top than at the bottom, and scarified to eliminate glazing. Tree pits shall be at least 2 feet greater in diameter than the root ball of earth or root system. Shrub pits shall be at least 1 foot greater than

the diameter of the root ball. Planting pits shall not be deeper than the height of the root ball.

- G. When excavation occurs in areas of heavily compacted earth, stones, concrete chunks or other foreign matter, pits shall be dug at least 3 times the width of the rootball. Excavated material from plant pits shall be disposed of as required.
- H. Container plants shall be removed from their growing container before planting. If roots are densely matted, the outer root mass shall be scored, sliced vertically, with a sharp knife to separate roots. All herbaceous plants and groundcovers shall be evenly spaced to produce a uniform effect and staggered in rows at intervals designated on the contract drawings.
- I. Shrubs and trees shall be set in the center of planting pits, plumb and straight, and at such a level that after settlement the crown of the roots will be 1-inch above the surrounding finished grade. Root ball masses shall not be loosened, broken or damaged. When balled and burlapped plants are set, planting mixture shall be compacted around bases of balls to fill all voids. All tying materials, twine and rope shall be cut and removed. Biodegradable burlap shall be laid back or cut away from the top half of the ball. If a wire basket is present, the upper 2/3 of the basket shall be cut away and removed. Do not remove the entire basket. Roots or bare root plants shall be properly spread out and planting mixture carefully worked in among them. Broken or frayed roots shall be cleanly cut.
- J. Backfill plant pits with planting mixture in layers of not more than 9-inches and firmly tamp each layer and water to sufficiently settle the backfilled soil before the next layer is put in place. When the planting pit is 2/3 backfilled, the hole shall be flooded and watered thoroughly so that the water level reaches the top of the planting pit. Allow water to soak in, then complete the backfilling operation. Immediately after planting pit is backfilled, a shallow basin 3-inches deep and slightly larger than the pit shall be formed with a ridge of soil for water retention. Form a common basin for plant materials throughout mass planting beds. After planting, lightly till the soil in planting beds between planting pits and rake smooth to eliminate compaction of soils.
- K. All planting hole basins shall be flooded with water twice within the first 24 hours of planting, and watered not less than twice per week until final acceptance of the work.
- L. All thin barked deciduous trees shall be wrapped after they are planted and before they are staked. Prior to wrapping, inspect trees for injury to trunks or improper pruning. Take corrective measures as necessary. Wrap trunks of all trees spirally from bottom to top with tree wrap and secure top and bottom at 2-foot intervals with jute twine. The wrapping shall overlap and entirely cover the trunk from the ground to the height of the second branches and shall be neat and snug. Overlap shall be approximately 2-inches.
- M. Stake trees immediately after planting as detailed. All staking apparatus shall be adequate to hold the tree in a vertical position under severe weather conditions. All staking

apparatus and tree trunk wrapping shall be removed and disposed of off-site by the Contractor at the end of one growing season.

- N. Immediately after planting and staking operations are complete, all plant pit basins and plant beds shall be covered with approved mulch to the depths designated on the plans. Mulch shall not contact tree bark, cover tree root flares, or shrub crowns. No mulch shall be applied prior to the first watering.
- O. The pruning of trees and shrubs shall only be permitted to remove dead or dying branch limbs and tips, sucker growth, water sprouts, crossing or rubbing branches, broken or damaged branches, diseased or insect infested limbs, and to preserve the natural character of the plant. Plant materials shall be pruned in accordance with American Nurserymen Association Standards and as required by the Engineer. Questionable weak limbs and branch removals that may disfigure the plant shall be left to the discretion of the Engineer. The tree leader shall never be permitted to be cut. Pruning shall be done with clean, sharp tools. All large pruning cuts that are ½-inch in diameter or larger shall be made along the bark branch ridge. Pruning cuts shall not breach or otherwise interfere with the branch collar. All pruning cuts less than ¼-inch diameter shall be made with hand pruners as close to the main stem as possible without damaging the cambium or bud. Tree paint shall not be used to cover pruning cuts.
- P. As the work proceeds, the Contractor shall remove all debris from the site, including but not limited to branches, rock, paper, and rubbish. All areas shall be kept clean, neat and in an orderly condition at all times. Prior to final acceptance, the Contractor shall cleanup the entire area to the satisfaction of the Engineer.

## 3.02 MAINTENANCE:

- A. Maintenance shall begin immediately after each plant is planted and shall continue until completion of the guarantee period and final acceptance of the project. Plants shall be watered, pruned, sprayed, fertilized, cultivated and otherwise maintained and protected. Tree guys and stakes shall be tightened and repaired. Defective work shall be corrected as soon as possible after it becomes apparent and weather and season permit.
- B. Settled plants shall be reset to proper grade and position, planting pits and common basins restored, and dead materials removed and replaced. Planting beds and individual basins shall be neat in appearance, maintained to their original layout lines and kept free of weeds. Mulch shall be replaced as required to maintain proper depths.
- C. Contractor shall make arrangements to provide sufficient water to maintain all trees, shrubs and plant materials until final acceptance. Plants shall be sprayed with anti-transpirant or anti-desiccant if required by seasonal conditions or as required by the Engineer.
- D. Planting areas shall be protected against trespass and damage of any kind during the maintenance period. This shall include the furnishing and installation of approved temporary fencing if necessary. If any plants become damaged during the maintenance

period, they shall be treated or replaced as required by the Engineer at no additional cost to the Owner.

## 3.03 INSPECTION AND PRELIMINARY ACCEPTANCE:

- A. Contractor shall provide written notice to the Engineer not less than 10 days before the anticipated date of inspection for preliminary acceptance. The Engineer shall recommend preliminary acceptance of the work of this Section only after completion and re-inspection of all necessary repairs, renewals or replacements.
- B. Inspection and acceptance of plantings may be requested and granted in part, provided the areas for which acceptance is requested are relatively substantial in size, and with clearly definable boundaries. Acceptance and use of these areas by the Owner shall not waive any other provisions of this Contract.

## 3.04 GUARANTEE:

- A. All plant materials shall be guaranteed for a period of one year after the date of completion of the specified maintenance period and preliminary acceptance of the project by the Owner.
- B. When the work is accepted in part, the guarantee period shall extend from each partial acceptance to the terminal date of the last guarantee period. All guarantee periods terminate at one time.
- C. Plants shall be healthy, free of pests and disease. Plants shall exhibit vigorous growth, shall bear foliage of normal density, size and color and shall have no less than seventy-five percent (75%) of their branches alive at the end of the guarantee period. If the leader of any single-leader species is dead, the entire plant shall be considered dead.
- D. Any plant required under this Contract that is dead or unsatisfactory, as determined by the Engineer, shall be removed from the site. These shall be replaced as soon as weather permits during the specified planting season, at no additional cost to the Owner, until the plants live through one year.
- E. All replacements shall be plants of the same kind and size as specified on the Plant List. They shall be furnished and planted as specified above.
- F. The guarantee of all replacement plants shall extend for an additional one-year period from the date of their acceptance as replacement.
- G. Guarantee shall not apply to the replacement of unacceptable plants resulting from the removal, loss, or damage due to occupancy of the project in any part; vandalism or acts

of neglect on the part of others; physical damage by animals, vehicles, etc.; and Acts of God, including but not limited to, catastrophic fire, hurricanes, riots, war, etc.

H. In the instance of curtailment of water by local water authorities (when supply was to be furnished by the Owner), the Contractor shall furnish all necessary water by water tanker, the cost of which will be approved and paid for by the Owner.

# 3.05 FINAL INSPECTION AND FINAL ACCEPTANCE:

- A. At the end of the guarantee period, the Contractor shall provide written notice to the Engineer not less than 10 days before the anticipated date of final inspection for final acceptance.
- B. The Engineer shall recommend final acceptance of the work of this Section only after completion and re-inspection of all necessary repairs, renewals or replacements.

# END OF SECTION

#### SECTION 03100

#### CONCRETE FORMWORK

#### PART 1 - GENERAL

#### 1.01 WORK INCLUDED:

This section of the specifications covers the furnishing and installation of forms for cast-in-place concrete.

- 1.02 RELATED WORK:
  - A. Section 03200, CONCRETE REINFORCEMENT
  - B. Section 03300, CAST-IN-PLACE CONCRETE
- 1.03 REFERENCES:

The following standards form a part of this specification:

### AMERICAN CONCRETE INSTITUTE (ACI)

- ACI 301 Standard Specifications for Structural Concrete
- ACI 347 Recommended Practices for Concrete Formwork
  - U.S. ARMY CORPS OF ENGINEERS (CE)
- CE 03300 Cast-in-Place Concrete

### PART 2 - PRODUCTS

- 2.01 MATERIALS:
  - A. Forms for exterior and interior surfaces which will be exposed to view after the work is completed, whether such surfaces are painted or unpainted, shall be new plywood stock, steel, tempered masonite, or other materials which will provide smooth concrete surfaces without subsequent surface plastering. Plastic or plastic-faced forms shall not be used, except with the prior approval of the Engineer.
  - B. Form Ties
    - 1. Provide factory-fabricated, adjustable length, removable or snap off metal form ties, designed to prevent form deflection and to prevent spalling of concrete surfaces upon removal.

- 2. Provide ties so that the portion remaining within concrete after removal of exterior parts is at least 1-1/2 inches from the outer concrete surface. Provide form ties, which will not leave a hole larger than one inch diameter in the concrete surface.
- C. Form release agent shall be a non-staining, non-yellowing, non-toxic liquid free from kerosene and resins of the type recommended by the manufacturer of the forming system being used such as EZ strip by L&M Construction Chemicals, Omaha, NB and "Magic Kote" by Symons Corp., Des Plaines, IL or approved equal.
- D. Where steel adjacent to vertical faces of forms cannot be otherwise secured, mortar doughnuts shall be used to prevent steel from lying too close to the finish vertical faces of the concrete.

## PART 3 - EXECUTION

## 3.01 PREPARATION:

Surfaces of forms to be in contact with concrete shall be greased with non-staining form release compound. Wetting will not be accepted as a substitute. Approval of the Engineer shall be obtained before use of coated materials or liners in lieu of form release compound, except as modified herein.

## 3.02 CONSTRUCTION:

- A. For concrete surfaces which will be visible after completion of the structure, painted or unpainted, the type and the precise location of form ties, nails joints between form members, and any other features which will leave a visible trace in the finished concrete, will be subject to the approval of the Engineer.
- B. Formwork shall be so constructed, braced, or tied that the formed surfaces of the concrete will be perfectly true, smooth, and to the dimensions shown on the drawings. All forms used for circular sections shall be true arcs as indicated on the drawings. Short chords will not be acceptable. Form line shall present an uninterrupted surface conforming to radii indicated on the drawings.
- C. Forms shall be sufficiently tight to prevent leakage of mortar, and when necessary shall have temporary openings as required for thorough cleaning, and as required for introduction of concrete to avoid excessive free fall. Panels damaged in stripping or otherwise shall not be reused.
- D. Unless otherwise noted on the design drawings, forms shall be filleted and chamfered at all sharp corners, and exposed edges with a 3/4-inch chamfer. Chamfer shall not be used where masonry or other material will subsequently be installed flush with one of the adjacent surfaces of the concrete. Where a wash or slope is indicated on the drawings no additional chamfer is required.

## 3.03 REMOVAL OF FORMS

### A. REMOVING FORMS AND SUPPORTS:

1. Removal of forms shall take place in accordance with ACI 347, Section 3.6. Except as otherwise specifically authorized by the Engineer, forms shall not be removed until the concrete has aged for the following number of day-degrees or attained 50 percent strength. (Day-degrees equals the total of number of days times the average daily air temperature at the surface of concrete. For example, 5 days at a daily average temperature of 60°F. equals 300 day-degrees.)

Location	Day-Degrees
Beams and Slabs	500
Walls and Vertical Surfaces	200

- B. Where beams, girder, columns, walls and similar vertical forms are adequately supported on shores, the side forms may be removed after 24 hours of cumulative curing time provided the side forms support no loads other than the lateral pressure of the plastic concrete. Cumulative curing time represents the sum of time intervals, not necessarily consecutive, during which the temperature of the air surrounding the concrete is above 50 deg. F in accordance with American Concrete Institute standards.
- C. Shoring shall not be removed until the concrete has attained at least 70 percent of the specified strength and sufficient strength to support safely its own weight and the construction live loads upon it.
- D. Forms shall be removed in such a manner as not to impair safety and serviceability of the structure. Concrete exposed by form removal shall have sufficient strength not to be damaged by the removal operation.

## END OF SECTION

#### SECTION 03200

#### CONCRETE REINFORCEMENT

#### PART 1 - GENERAL

#### 1.01 WORK INCLUDED:

This section of the specification covers the furnishing and installation of reinforcement for cast-in-place concrete.

- 1.02 RELATED WORK:
  - A. Section 03300, CAST-IN-PLACE CONCRETE
- 1.03 SYSTEM DESCRIPTION:

Materials and construction shall conform to ACI 318 and ACI 350 unless otherwise noted on the design drawings or modified herein.

- 1.04 SUBMITTALS: IN ACCORDANCE WITH REQUIREMENTS OF GENERAL SPECIFICATIONS, SUBMIT THE FOLLOWING:
  - A. The Contractor shall furnish the Engineer with complete checked, reinforcing steel shop drawings and bar lists. Shop drawing shall include grade of steel used as well as splice lengths.
  - B. Mill test reports shall accompany drawings. Fabrication shall not commence until the drawings and mill test reports have been released by the Engineer.
- 1.05 REFERENCES:
  - A. The following standards form a part of these specifications:

American Concrete Institute (ACI)

- ACI SP-66 ACI Detailing Manual
- ACI 318 Building Code Requirements for Concrete

American Society for Testing and Materials (ASTM)

ASTM A185 Standard Specification for Welded Steel Wire Fabric for Concrete Reinforcement

- ASTM A497 Specification for Welded Deformed Steel Wire Fabric for Concrete Reinforcement
- ASTM A615 Deformed Billet-Steel Bars for Concrete Reinforcement
- ASTM A775 Epoxy-coated Reinforcing Steel Bars
- ASTM A884 Epoxy-coated Welded Wire Fabric

American Welding Society (AWS)

AWS 12.1 Recommended Practices for Welding Reinforcing Steel, Metal Inserts and Connections in Reinforced Concrete Construction

### PART 2 - PRODUCTS

- 2.01 MATERIALS:
  - A. Steel reinforcing bars shall conform to ASTM A615, Grade 60, and A775 if epoxy-coated bars are specified.
  - B. Welded steel wire fabric shall conform to ASTM A185 or ASTM A497 and ASTM A884 if epoxy-coated fabric is specified. Gauge and spacing of wires shall be as indicated on the drawings.
  - C. Reinforcing steel shall be detailed in accordance with ACI SP-66 modified as applicable to conform to ACI 318.
  - D. Reinforcement shall be accurately formed to the dimensions indicated on the drawings. Bars shall be shipped to the site with bars of the same size and shape, fastened in bundles with securely wired-on metal identification tags listing both size and mark.
  - E. Any bar showing cracks after bending shall be discarded.
  - F. Steel failing to meet the requirements of this specification or the drawings will be rejected and shall be removed from the site immediately.

## PART 3 - EXECUTION

### 3.01 STEEL INSTALLATION:

- A. Before being placed in position, reinforcement shall be thoroughly cleaned of loose mill and rust scale, dirt, and other coatings (including ice), that reduce or destroy bond. When there is a delay in depositing concrete after reinforcement is in place, bars shall be reinspected and cleaned as necessary.
- B. After forms have been oiled, but before concrete is placed, all steel shall be securely wired in the exact position called for, and shall be maintained in that position until all concrete is placed and compacted. Chair bars and supports shall be provided in a number and arrangement satisfactory to the Engineer.
- C. Concrete blocks having a minimum bearing area of 2-inches by 2-inches and equal in quality to that specified for the slab, shall be used for supporting reinforcing bars for slabs on grade. Wood blocks, stones, brick chips, etc., shall not be used to support reinforcement.
- D. Metal supports shall be of types that will not penetrate the surface of formwork or slab and which will not show through or stain surfaces that are to be exposed to view, painted or unpainted.
- E. Welding of reinforcing bars will be permitted only where permission of the Engineer has been obtained in advance. Such welding shall be performed only under conditions established by the Engineer, and in accordance with AWS 12.1.
- F. Reinforcement, which is to be exposed for a considerable length of time after having been placed, shall be painted with a heavy coat of cement grout, if required by the Engineer.

# END OF SECTION

#### SECTION 03300

#### CAST-IN-PLACE CONCRETE

#### PART 1 - GENERAL

#### 1.01 WORK INCLUDED:

This Section covers all concrete and all related items necessary to place and finish the concrete work.

- 1.02 RELATED WORK:
  - A. Section 02300, EARTHWORK
  - B. Section 03200, CONCRETE REINFORCEMENT
  - C. Items furnished under other Sections and installed under this Section include, but are not limited to:

Items embedded in concrete, including anchors, sleeves, floor drains, castings, frames for hatches, angles, nosings, and other miscellaneous metals.

#### 1.03 REFERENCES:

A. The following standards form a part of these specifications:

American Concrete Institute (ACI)

- ACI 301 Structural Concrete for Buildings
- ACI 302 Recommended Practice for Concrete Floor and Slab Construction
- ACI 304 Recommended Practice for Measuring, Mixing, Transporting, and Replacing Concrete
- ACI 305 Recommended Practice for Hot Weather Concreting
- ACI 306 Recommended Practice for Cold Weather Concreting
- ACI 318 Building Code Requirements for Reinforced Concrete
- ACI 347 Recommended Practice for Concrete Formwork

American Society for Testing and Materials (ASTM)

- ASTM C33 Concrete Aggregates
- ASTM C39 Compressive Strength of Cylindrical Concrete Specimens
- ASTM C42 Obtaining and Testing Drilled Cores and Sawed Beams of Concrete
- ASTM C87 Effect of Organic Impurities in Fine Aggregate on Strength of Mortar
- ASTM C94 Ready-Mixed Concrete
- ASTM C143 Standard Method for Slumps of Portland Cement Concrete
- ASTM C150 Portland Cement
- ASTM C171 Sheet Materials for Curing Concrete
- ASTM C231 Air Content of Freshly Mixed Concrete by the Pressure Method
- ASTM C260 Air-Entraining Admixtures for Concrete
- ASTM C309 Liquid Membrane-Forming Compounds for Curing Concrete
- ASTM C494 Chemical Admixtures for Concrete
- ASTM D1751 Preformed Expansion Joint Fillers for Concrete Paving and Structural Construction (Non-extruding and Resilient Bituminous Types)
- ASTM D1752 Preformed Sponge Rubber and Cork Expansion Joint Fillers for Concrete Paving and Structural Construction
- 1.04 SUBMITTALS: IN ACCORDANCE WITH REQUIREMENTS OF GENERAL SPECIFICATIONS, SUBMIT THE FOLLOWING:
  - A. Six sets of shop drawings of the materials specified herein shall be submitted to the Engineer for review.
  - B. Six copies of the statement of materials constituting the design of mixes which satisfy the specified strength for each size aggregate as required by ASTM C94 shall be submitted to the Engineer within one week following award of the contract.
  - C. Provide one copy of the "Certificate of Delivery" for each load of concrete as it arrives on the site, under the provisions of ASTM C94.

### PART 2 - PRODUCTS

2.01 CONCRETE:

A. Concrete conforming to the requirements listed below shall be used where indicated on the drawings. Unless otherwise indicated, or approved by the Engineer, concrete shall be the 4,000 psi mix.

Minimum Comp. Strength at 28 days (psi)	Maximum Water/Cement ratio (gallons per bag of cement)*	Cement Factor: 94 lb. Bags per cubic yard minimum**	
3000	0.59 (6.9)	5.5	
4000	0.48 (5.6)	6.5	
5000	0.40 (4.7)	7.4	

TABLE
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\* Based on air-entrained concrete. If non-air-entrained concrete is called for, the listed maximum water/cement ratios may be increased slightly, as approved by the Engineer. The water is the total water in the mix, including free water on the aggregate.

\*\* These are minimum amounts; increase as necessary to meet mix requirements.

- B. Concrete shall conform to ASTM C94. One copy of the Certificate of Delivery required by ASTM C94 shall be delivered to the Engineer immediately upon arrival of each load of concrete at the site. The Contractor shall be responsible for the design of the concrete mixtures.
- C. Standard compression tests of all proposed mixes shall be made by the testing laboratory or other satisfactory evidence shall be presented that the design mixes will attain the minimum strengths listed on the design drawings or called for herein, within the limitations of the ACI Code. No concrete shall be delivered to the job site until the Engineer has approved the design mixes.
- D. All concrete (unless otherwise directed) shall contain an air-entraining agent. Air entrained concrete shall have an air content by volume of 3 to 6 percent for 1-l/2-inch aggregate and 4 to 8 percent for 3/4-inch aggregate. The air content shall be the responsibility of the testing laboratory and in accordance with ASTM C231.
- E. All concrete shall contain a mid-range water reducer to minimize cement and water content of the mix, at the specified slump, in accordance with ASTM C494.
- F. Slump for all concrete shall be from 3-inch to 4-inch, except for concrete using a superplasticizer, when the maximum slump shall be 8 inches. Any concrete having a slump greater than 4 inches (8 inches with superplasticizer) shall be promptly removed from the site.
- G. No calcium chloride or admixtures containing calcium chloride shall be added to the concrete. No admixture other than those specified shall be used in concrete without the specific written permission of the Engineer in each case.

- H. No additional water, except for the amount indicated by the design mix shall be added to the concrete without the prior permission of the Engineer.
- 2.02 CEMENT:
  - A. The cement shall be an approved brand of American manufactured Portland Cement, Type II conforming to ASTM Cl50. The brand name and type of cement proposed for use shall be submitted to the Engineer for approval immediately following award of contract. Only one color of cement, all of the same manufacture, shall be used for the work.
  - B. When the use of high-early-strength Portland cement (Type III) is permitted by the Engineer the same strength requirements shall apply, but the indicated strengths shall be attained in 7 days instead of 28 days.
- 2.03 ADMIXTURES:
  - A. Air entraining agent shall be in accordance with ASTM C260.
  - B. Water reducing agent shall be a mid-range water reducer meeting ASTM C494, Type A.
  - C. Water reducing agent-retarder shall be in accordance with ASTM C494, Type D.
  - D. Superplasticizer agent shall be in accordance with ASTM C494, Type F or Type G and contain no more than 0.1% chloride ions. Product may be plant added or field added based on the best application considering distance, temperature and time.
- 2.04 AGGREGATES:
  - A. Except as otherwise noted, aggregate shall conform to the requirements of ASTM C33.
  - B. Fine aggregate shall consist of washed inert natural sand conforming to the requirements of ASTM C33.
  - C. Coarse aggregate shall consist of well-graded crushed stone or washed gravel conforming to the requirements of ASTM C33.
  - D. The following designated sizes of aggregate shall be the maximum employed in concrete.

2-inch for mass concrete
1½-inch for reinforced sections 18-inch and over in thickness
3/4-inch for reinforced and un-reinforced sections less than 18-inch thickness.

2.05 WATER:

Water for concrete shall be potable, free from injurious amounts of oil, acid, alkali, organic matter and other deleterious substances.

## 2.06 NON-METALLIC SHRINKAGE RESISTANT GROUT

A. Grout: ASTM C 1107, factory-packaged, nonmetallic aggregate grout, noncorrosive, nonstaining, mixed with water to consistency suitable for application and a 30-minute working time. The minimum ultimate compressive strength of the grout shall be 5000 psi at 7 days and 7500 psi at 28 days.

### 2.07 CURING MATERIALS:

- A. Curing compound shall be a curing/hardener compound such as Acurion by AntiHydro, Sikaguard Cure/Hard by Sika, Super Diamond Clear by Euclid or approved equal.
- B. Curing paper shall be a fiber-reinforced laminated Kraft bituminous product conforming to the requirements of ASTM Cl7l.

## 2.08 JOINT FILLER:

- 1. Preformed joint filler strip shall conform to ASTM DI751 or DI752, having a thickness as indicated on the drawings.
- 2. Fillers shall be provided in pieces of the full thickness required. Use of multiple layers of thin pieces to make-up the full thickness will not be permitted.

## 2.09 JOINT SEALANT:

Joint sealant for construction and control joints shall be a two-part polysulfide base sealant conforming to Thiokol's Building Trade Performance Specification, Class A (self-leveling), Type II (hardness: 35-45 Shore A).

### PART 3 - EXECUTION

### 3.01 GENERAL:

Under no circumstances shall concrete that has set or partially set before placing be used; and no re-tampering of concrete or grout will be permitted.

### 3.02 PREPARATION:

- A. Before placing concrete, forms and the space to be occupied by the concrete shall be thoroughly cleaned, and reinforcing steel and embedded metal shall be free from dirt, oil, mill scale, loose rust, paint or other material which would tend to reduce the bond.
- B. Earth, concrete, masonry, or other water-permeable material against which concrete is to be placed shall be thoroughly saturated with water immediately before concrete is placed. No concrete shall be placed until the consolidation of the ground and the arrangement and details of forms and reinforcing have been inspected and approved by the Engineer.

- C. When joining fresh concrete to concrete which has attained full set, the latter shall be cleaned by chipping and washing off all dirt and scum and laitance. It then shall be moistened prior to placing new concrete.
- D. Concrete surfaces that act as a seat for structural members (other than those resting on grout) shall be troweled to an extremely flat and level surface. If necessary, such surfaces shall be ground off to achieve the required flatness and level.
- E. Fill concrete on top of concrete shall be placed in the locations indicated on the drawings or designated by the Engineer. Before fill concrete is placed, the following procedures shall be used to prepare surfaces; all dirt, scum and laitance shall be removed by chipping and washing. The clean, roughened base surface shall be saturated with water, but shall have no free water on the surface. A coat of 1:2 cement-sand grout, approximately 1/8-inch thick, shall be well scrubbed into the thoroughly dampened concrete base. The concrete fill shall be placed immediately, before grout has dried or set. Fill concrete shall be brought to the lines and grades shown on the drawings or approved by the Engineer.
- F. Concrete for thrust and anchor blocks shall be placed against undisturbed earth and wooden side forms shall be used to provide satisfactory lines and dimensions. Felt roofing paper shall be placed to protect joints. No concrete shall be placed so as to cover joints, bolts or nuts, or to interfere with the removal of the joints. Minimum bearing areas and dimensions shall be as shown on the drawings.

## 3.03 MIXING:

- A. Concrete shall be ready-mixed, or transit-mixed, as produced by equipment acceptable to the Engineer. No hand-mixing will be permitted. Adding water in controlled amounts during the mixing cycle shall be done only with the express approval of, and under the direction of, the Engineer.
- B. Ready-mix or transit-mixed concrete shall be transported to the site in watertight agitator or mixer trucks loaded not in excess of rated capacities for the respective conditions as stated on the nameplate. Discharge at the site shall be within 1-1/2 hours after cement was first introduced into the mix. Central mixed concrete shall be plant-mixed a minimum of 1-1/2 minutes per batch and then shall be truck-mixed or agitated a minimum of 8 minutes. Agitation shall begin immediately after the pre-mixed concrete is placed in the truck and shall continue without interruption until discharge. Transit-mixed concrete shall be mixed at mixing speed for at least 10 minutes immediately after charging the truck, followed by agitation without interruption until discharged.
- C. All central plant and rolling stock equipment and methods shall conform to the latest Truck Mixer and Agitator Standards of the Truck Mixer Manufacturers' Bureau of the National Ready-Mixed Concrete Association, as well as ACI 304 and ASTM C94.

D. Attention is called to the importance of dispatching trucks from the batching plant so that they shall arrive at the site of the work just before the concrete is required, thus avoiding excessive mixing of concrete while waiting or delays in placing successive layers of concrete in the forms.

## 3.04 INSTALLATION/APPLICATION/ERECTION:

- A. PLACING:
  - 1. No concrete shall be placed by pumping methods without the prior written approval of the Engineer. Should the Contractor be allowed to place concrete by pumping methods, procedures, mix design of concrete, and all other precautions shall be in accordance with ACI 304.2R and as approved by the Engineer.
  - 2. Concrete shall be placed in alternate areas, as defined by the construction and control joints indicated on the design drawings. A minimum of 3 days shall elapse between placement of adjacent sections.
  - 3. Segregation of the concrete shall be prevented during handling; should any segregation occur, the concrete should be remixed before it is placed. Concrete shall be placed in the forms in horizontal layers not over 1 to 2 feet thick. Concrete shall not be allowed to drop freely more than 4 feet. If the free drop to the point of placement must exceed 4 feet, the Contractor shall obtain the approval of the Engineer for the proposed method of depositing the concrete. The concrete shall not be required to flow over distances greater than 3 feet in any direction in the forms or on the ground, unless otherwise permitted by the Engineer.
  - 4. Unless otherwise noted, the work begun on any day shall be completed in daylight of the same day.
  - 5. "Cold Joints" are to be avoided, but if they occur, they are to be treated as bonded construction joints.
  - 6. Chutes for conveying concrete shall be of U-shaped design and sized to insure a continuous flow of concrete. Flat (coal) chutes shall not be employed. Chutes shall be metal or metal-lined, and each section shall have approximately the same slope. The slope shall not be less than 25 nor more than 45 degrees and shall be such as to prevent segregation of the ingredients. The discharge end of the chute shall be provided with a baffle plate or spout to prevent segregation. If the discharge end of the chute is more than 5 feet above the surface of the concrete in the forms, a spout shall be used and the lower end maintained as near the surface of deposit as practicable. When the operation is intermittent, the chute shall discharge into a hopper. Chutes shall be thoroughly cleaned before and after each run, and the debris and any water shall be discharged outside the forms. Concrete shall not be allowed to flow horizontally more than 5 feet.
  - 7. Concrete during and immediately after depositing shall be thoroughly compacted by means of suitable tools. Internal type mechanical vibrators shall be employed

to produce the required quality of finish. Vibration shall be done by experienced operators under close supervision and shall be carried on long enough to produce homogeneity and optimum consolidation without permitting segregation of the solid constituents or "pumping" or migration of air. All vibrators shall be supplemented by proper wooden spade puddling adjacent to forms to remove included bubbles and honeycomb. This is essential for the top lifts of walls. All vibrators shall travel at least 10,000 rpm and be of adequate capacity. At least one vibrator shall be used for every 10 cubic yards of concrete per hour. In addition, one spare vibrator in operating condition shall be on the site.

- 8. Concrete slabs on the ground shall be well-tamped into place and foundation material shall be wet, tamped, and rolled until thoroughly compacted prior to placing concrete.
- 9. Concrete shall be deposited continuously in layers of such thickness that no concrete will be deposited on concrete which has hardened sufficiently to cause the formation of seams and planes of weakness within the section. If a section cannot be placed continuously, construction joints may be located at points as provided for in the drawings or approved by the Engineer.
- 10. Chutes, hoppers, spouts, adjacent work, etc., shall be thoroughly cleaned before and after each run, and the water and debris shall not be discharged inside the form.

# B. CONCRETE PLACING DURING COLD WEATHER:

- 1. Concrete shall not be placed on frozen ground, and no frozen material or material containing ice shall be used. Materials for concrete shall be heated when concrete is mixed, placed, or cured when the mean daily temperature is below 40°F, or is expected to fall to below 40°F, within 72 hours, and the concrete after placing shall be protected by covering, heat, or both. No accelerant shall be used to prevent freezing.
- 2. The temperature of concrete surfaces shall not be permitted to drop below 50°F. for at least 7 days after placement of the concrete.
- 3. All details of Contractor's handling and protecting of concrete during freezing weather shall be subject to the approval and direction of the Engineer. All procedures shall be in accordance with provisions of ACI 306.

# C. CONCRETE PLACING DURING HOT WEATHER:

- 1. Concrete just placed shall be protected from the direct rays of the sun and the forms and reinforcement just prior to placing shall be sprinkled with cold water. The Contractor shall make every effort to minimize delays which will result in excessive mixing of the concrete after arrival on the job.
- 2. During periods of excessively hot weather (90°F, or above) ingredients in the concrete shall be cooled insofar as possible and cold mixing water shall be used to

maintain the temperature of the concrete at permissible levels all in accordance with the provisions of ACI 305. Any concrete with a temperature above 90°F, when ready for placement will not be acceptable, and will be rejected.

3. Temperature records shall be maintained throughout the period of hot weather giving air temperature, general weather conditions (calm, windy, clear, cloudy, etc.) and relative humidity. The record shall include checks on temperature of concrete as delivered and after placing in forms. Data should be correlated with the progress of the work so that conditions surrounding the construction of any part of the structure can be ascertained.

## D. PIPES AND EMBEDDED METALS:

- 1. Special care shall be taken to bring the concrete into solid contact with pipes and iron work embedded in the walls and floors, particularly underneath and around all pipes where a head of water exists, making watertight joints.
- 2. In general, such embedded items are not shown on the structural design drawings. Design drawings of the other trades shall be consulted for their location and details.
- 3. Anchor bolt location, size and details shall be verified with the equipment manufacturers certified drawings before installation.
- 4. Anchor bolts, reglets, sleeves, edge angles and similar embedded items will be provided, delivered to the site under other Sections of the specification, for installation under this Section.
- 5. Where edge angles, etc., have nuts welded on to receive machine screws, the threads of the nuts shall be protected from concrete, and the concrete shall be excluded from the space to be occupied by the screw, by the use of wood plugs or other effective means.
- 6. Inserts required for hanging mechanical and electrical items will be provided and installed in the forms under the mechanical and electrical Sections of the specification.
- 7. Should the Contractor be allowed to leave openings in the concrete for pipes or ironwork, to await the arrival of items that would delay the prosecution of the work, the openings shall be subject to the approval of the Engineer. Appropriate construction joints shall be provided. In filling any such openings with concrete, a mixture of 1: 1-1/2: 3 shall be used and a watertight bond shall be secured between the old and new concrete.
- 8. In bolting miscellaneous items to concrete after the concrete has set, expansion bolts of an approved pattern and type shall be used. The Contractor shall submit to the Engineer, for approval, the types of expansion bolts. Expansion bolts shall not be used until they are approved.

## E. CURING:

- 1. Concrete curing shall be performed as specified in ACI 30l and as stated herein. All curing procedures shall have prior approval of the Engineer.
- 2. Concrete Floors

Concrete floors which are to receive paint, concrete fill, mortar setting beds, grout fill, or any other subsequent finish shall be cured by one of the following procedures immediately after completion of placement and finishing:

- a. Ponding or continuous sprinkling.
- b. Application of absorptive mats or fabric kept continuously wet.
- c. Application of sand kept continuously wet.
- d. Application of waterproof sheet materials conforming to ASTM Cl7l.
- e. Application of curing compounds conforming to ASTM C309, if it can be demonstrated to the Engineer's satisfaction that the compound is applicable and that it will not prevent bonding of the subsequent finish to be received. Compound shall be placed at a rate of 200 square feet per gallon, in two applications perpendicular to each other.
- 3. Curing procedure shall be continued for at least 7 days.
  - a. Moisture loss from surface placed against metal or wood forms shall be minimized by keeping forms wet until removal.
  - b. Curing shall be continued for at least 7 days. When forms are removed during the curing period, surfaces shall be cured by spraying or by the use of a curing compound as previously specified.
  - c. Surfaces shall be protected from traffic or damage until surfaces have hardened sufficiently. If necessary, 1/2-inch thick plywood sheets shall be used to protect the exposed surface.

### F. BRACING AND SUPPORTS:

- 1. All concrete members shall be adequately and safely supported and braced until the permanent supports and braces are installed.
- 2. Backfilling against exterior walls shall not be done until supporting slabs are in place and have attained 70 percent of design strength, otherwise walls shall be braced against earth lateral pressure, using a system approved by the Engineer.
- 3. Backfilling against retaining walls shall not commence until the wall concrete has reached its 28 day strength.

## G. REMOVING FORMS AND SUPPORTS:

1. Removal of forms shall take place in accordance with ACI 347, Section 3.6. Except as otherwise specifically authorized by the Engineer, forms shall not be removed until the concrete has aged for the following number of day-degrees or attained 50 percent strength. (Day-degrees equals the total of number of days times the average daily air temperature at the surface of concrete. For example, 5 days at a daily average temperature of 60°F. equals 300 day-degrees.)

Location	Day-Degrees
Beams and Slabs	500
Walls and Vertical Surfaces	200

2. Shores under beams and slabs shall not be removed until the concrete has attained at least 70 percent of the specified cylinder strength and also sufficient strength to support safely its own weight and the construction loads upon it.

## H. PATCHING:

- 1. Defective concrete and honeycombed areas as determined by the Engineer shall be chipped down reasonably square and at least one-inch deep to sound concrete by means of hand chisels or pneumatic chipping hammers. Irregular voids or surface stones need not be removed if they are sound, free of laitance, and firmly imbedded in the parent concrete, subject to Engineer's final inspection. If honeycomb exists around reinforcement, chip to provide a clear space at least 1-inch wide all around the steel. For areas less than 1-1/2 inches deep, the patch may be made following the procedure for filling form tie holes, described in the subsection below, using adequately dry (non-trowelable) mixtures to avoid sagging. Thicker repairs will require build-up in 1-inch layers on successive days. Unless otherwise indicated, thicker repairs shall be made with Vertipatch mortar mixture blended with Acryl-Set, both by Master Builders, Inc., Cleveland, Ohio, or approved equal.
- 2. For concrete areas exposed to serious abrasion and/or impact forces, the Engineer may order the use of grout with a non-shrink metallic aggregate (Embeco by Master Builders, Inc.; Ironite by Fox Industries, Madison, IL; or approved equal) as an additive in the proportions listed below:

	Small Patches		Large Formed Patches	
Material	Volumes	Weights	Volumes	Weights
Cement	1.0	1.0	1.0	1.0
Metal Aggregate	0.15	0.25	0.2	0.33
Sand	1.5	1.5	1.5	1.0

Pea Gravel -			1.5	1.5
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#### I. FINISHING OF FORMED SURFACES:

- 1. All concrete which is to be left exposed to view shall be scraped to remove projecting imperfections left by voids in the forms.
- 2. In addition to scraping, exterior exposed concrete shall be covered with a cement-base plaster mix. The mix shall consist of Thoroseal Plastic Mix and Acryl 60, as manufactured by Standard Drywall Products, Miami, FL, or approved equal. It shall be mixed and applied in accordance with the manufacturer's recommendations.
- 3. To permit satisfactory finishing, forms shall be removed from the vertical faces of the concrete as early as is possible without damaging the surface. Immediately after stripping forms, any fins or projections left by the forms shall be chipped off, and the surfaces rubbed smooth.
- 4. Form tie holes and other voids and faults shall be patched. Voids shall be cleaned out, roughened, thoroughly wetted, coated with neat cement paste, and filled with mortar of cement and sand in the same proportions, materials, and color as used in the concrete. The surface of the patch shall be flush with the surrounding surface after finishing operations are complete. Surface shall be kept continuously damp until patches are firm enough to be rubbed without damage.
- 5. Rubbing shall be performed while the surface is wet using a carborundum or cement sand brick, to achieve a smooth uniform, even textured finish. Patched and chipped areas shall be blended to match as closely as possible the appearance of the rest of the surface. No cement wash or plastering will be permitted, and no mortar shall be used except as required above.
- 6. Where finishing is performed before the end of the curing period, concrete shall under no circumstances be permitted to dry out, and shall be kept continuously moist from time of placing until end of curing period, or until curing membrane is applied.

### J. CONCRETE FLOOR FINISHING REQUIREMENTS:

1. Unless designated otherwise, concrete floors shall have a troweled finish as specified in Section II.7 of ACI 301. Troweled finishes shall conform to the requirements of "Class A Tolerances," Section II.9 as specified in ACI 301.

# K. TESTING:

1. The Contractor shall provide all field testing and inspection services, and shall pay for all such services. The Engineer shall approve the testing laboratory and shall inform the Contractor when samples are to be taken for testing. The

Contractor shall forward all test results to the Engineer as soon as they are available.

- a. The Testing Laboratory shall conform to the requirements of ASTM E-329 as modified in 780 CMR R1 in the State Building Code. They shall be licensed by the State Board of Building Regulations and Standards.
- 2. At least one slump test shall be performed from each truck load of concrete. The sample for slump shall be taken from the middle third of a truck load. Air content tests shall be made at the discretion of the Engineer. If the measured slump or air content falls outside the specified limits, a check test shall be made immediately on another portion of the same sample. In the event of a second failure, the concrete shall be considered to have failed the requirements of the specification and shall be immediately removed from the jobsite to be discarded.
- 3. The Contractor shall advise the Engineer of his readiness to proceed with concrete placement at least one working day prior to each placement. The Engineer will inspect the preparations for concrete, including the preparation of previously placed concrete, the reinforcing, and the alignment and tightness of formwork. No placement shall be made without the prior approval of the Engineer.
- 4. A minimum of four standard compression test cylinders shall be made and tested for each 100 cubic yards or fraction thereof for each type and design strength of concrete from each day's placement of concrete. One cylinder shall be tested at 7 days and two cylinders at 28 days. The fourth cylinder from each set shall be kept until the 28 day test report on the second and third cylinders in the same set has been received. The Engineer reserves the right to require test cylinders to be made for each truckload of concrete if the nature of the project or project experience indicates such additional tests are required for proper control of concrete quality; such tests will be at the Owner's expense.
- 5. The strength level shall be considered satisfactory so long as the averages of all sets of three consecutive strength test results equal or exceed the specified strength fc, and no individual strength test (average of two cylinders) result falls below the specified strength fc by more than 500 psi.
- 6. In the event the average compressive strength of the two 28 day cylinders do not achieve the required level, the Engineer may elect to test the fourth cylinder immediately or test it after 56 days.

# L. FAILURE TO MEET REQUIREMENTS:

1. The Engineer shall have the right to reject concrete represented by low strength tests or to agree to further testing of the concrete. Rejected concrete shall be promptly removed and replaced with concrete conforming to the specification. The decision of the Engineer as to whether substandard concrete is to be accepted or rejected or additional tests shall be conducted shall be final. All direct and indirect costs associated with further curing and testing of the concrete shall be at the Contractor's expense. All costs associated with removing rejected concrete,

placing new concrete, and conducting tests on new concrete shall be at the Contractor's expense.

- 2. If the Engineer agrees to consider further curing and/or testing of the concrete before making a final decision, the Contractor shall submit a detailed plan to the Engineer, including proposed criteria for acceptance of the concrete. The plan may include additional curing of the concrete, drilling and testing of cores, load testing of the structure, or a combination.
- 3. If additional curing is permitted before further inspection and testing, the Contractor shall provide any necessary materials and labor to further cure the suspect concrete.
- 4. If drilling and testing of cores is permitted, the Contractor shall be responsible for obtaining the cores, including provision of ladders, scaffolding, and such incidental equipment as may be required. If additional curing is permitted, cores shall be drilled after the curing period, and shall be in accordance with ASTM Methods C39 and C42. The Contractor shall repair all core holes to the satisfaction of the Engineer.
- 5. The burden of proof, including, but not limited to the work of cutting and testing the cores, inspection, evaluation, engineering, repair of the holes, or removal and replacement of the concrete in question, and all associated costs therefor, shall be at the expense of the Contractor.
- 6. If load testing of the concrete is permitted, and if not otherwise indicated, slabs or beams under load test shall be loaded with their own weights plus a superimposed load of 2 times the design live load. The load shall be applied uniformly over the portion being tested in the approved manner and left in position for 24 hours. The structure shall be considered satisfactory if deflection "D" in feet, at end of 24-hour period, does not exceed the following value:

D equals 0.001 (L x L)/t

in which "L" is span in feet, "t" is depth of slab, or beam in inches. If deflection exceeds "D" in the above formula, the concrete shall be considered faulty unless within 24 hours after removal of the load, the slab, or beam under test recovers at least 75 percent of the observed deflection.

7. If the suspect concrete still fails to meet specification requirements, the Engineer shall have the right to reject the concrete, have it removed and replaced, in accordance with paragraph 5 above, or to require mechanical strengthening of the concrete to satisfy project requirements. The Contractor shall submit a removal and replacement plan for review by the Engineer.

# END OF SECTION

### SECTION 03360

### INTEGRALLY COLORED CONCRETE

### PART 1 - GENERAL

### 1.01 SUMMARY:

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification sections, apply to Work of this Section.
- B. Section Includes:
  - 1. Integrally colored concrete pavement.
  - 2. Curing of integrally colored concrete.
- C. Related Sections:
  - 1. Division 3 Section "Cast-In-Place Concrete" for general applications of concrete and coordination of sample submittal and color selection.
  - 2. Division 7 Section "Joint Sealants" for colored sealant for joints.

### 1.02 REFERENCES:

- A. American Concrete Institute (ACI):
  - 1. ACI 301 "Specification for Structural Concrete."
  - 2. ACI 302 IR "Recommended Practice for Concrete Floor and Slab Construction."
  - 3. ACI 303.1 "Standard Specification for Cast-In-Place Architectural Concrete."
  - 4. ACI 304 "Recommended Practice for Measuring, Mixing, Transporting and Placing of Concrete."
  - 5. ACI 305R "Recommended Practice for Hot Weather Concreting."
  - 6. ACI 306R "Recommended Practice for Cold Weather Concreting."
- B. American Society for Testing and Materials (ASTM):
  - 1. ASTM C309 "Liquid Membrane-Forming Compounds for Curing Concrete."
  - 2. ASTM C494 "Standard Specification for Chemical Admixtures for Concrete."
  - 3. ASTM C979 "Standard Specification for Pigments for Integrally Colored Concrete."
- C. American Association of State Highway and Transportation Officials (AASHTO):

- 1. AASHTO M194 "Chemical Admixtures."
- D. Portland Cement Association
  - 1. PCA PA124 Finishing Concrete Slabs with Color and Texture.
  - 2. PCA SP021 Color and Texture in Architectural Concrete.

# 1.03 SUBMITTALS:

- A. Product Data: Submit manufacturer's complete technical data sheets for the following:
  - 1. Colored admixture.
  - 2. Curing compound.
- B. Design Mixes: For each type of integrally colored concrete.
- C. Samples for Initial Selection: Manufacturer's color charts showing full range of colors available.
- D. Qualification Data: For firms indicated in "Quality Assurance" Article, including list of completed projects.
- 1.04 QUALITY ASSURANCE:
  - A. Manufacturer Qualifications: Manufacturer with 10-years of experience in the production of specified products.
  - B. Installer Qualifications: An installer with 5 years of experience with work of similar scope and quality.
  - C. Comply with the requirements of ACI 301.
  - D. Obtain each specified material from same source and maintain high degree of consistency in workmanship throughout Project.
  - E. Notification of manufacturer's authorized representative shall be given at least 1week before start of Work.
  - F. Integrally Colored Concrete Mockups:
    - 1. Provide under provisions of Division 1 Section "Quality Control."
    - 2. At location on Project selected by Landscape Architect, place and finish 10 feet by 10 feet area.
    - 3. For accurate color, the quantity of concrete mixed to produce the sample should not be less than 3 cubic yards or not less than 1/3 the capacity of the

mixing drum on the ready-mix truck and should always be in full cubic yard increments. Excess material shall be discarded according to local regulations.

- 4. Construct mockup using processes and techniques intended for use on permanent work, including curing procedures. Include samples of control, construction, and expansion joints in sample panels. Mockup shall be produced by the individual workers who will perform the work for the Project.
- 5. Retain samples of cements, sands, aggregates and color additives used in mockup for comparison with materials used in remaining work.
- 6. Accepted mockup provides visual standard for work of Section.
- 7. Mockup shall remain through completion of work for use as a quality standard for finished work.
- 8. Remove mockup when directed.

# 1.05 DELIVERY, STORAGE AND HANDLING:

A. Colored Admixture: Comply with manufacturer's instructions. Deliver colored admixtures in original, unopened packaging. Store in dry conditions.

### 1.06 PROJECT CONDITIONS:

- A. Integrally Colored Concrete Environmental Requirements:
  - 1. Schedule placement to minimize exposure to wind and hot sun before curing materials are applied.
  - 2. Avoid placing concrete if rain, snow, or frost is forecast within 24-hours. Protect fresh concrete from moisture and freezing.
  - 3. Comply with professional practices described in ACI 305R and ACI 306R.
- B. Schedule delivery of concrete to provide consistent mix times from batching until discharge. Mix times shall meet manufacturer's written recommendations.

# 1.07 PRE-JOB CONFERENCE:

- A. One week prior to placement of integrally colored concrete a meeting will be held to discuss the Project and application materials.
- B. It is suggested that the Landscape Architect, Engineer, General Contractor, Construction Manager, Subcontractor, Ready-Mix Concrete Representative, and a Manufacturer's Representative be present.

# PART 2 - PRODUCTS

# 2.01 ACCEPTABLE MANUFACTURER:

### 02/14/2018

- A. L. M. Scofield Company, Douglasville, Georgia and Los Angeles, California
  - 1. Phone (800) 800-9900 or
  - 2. Local contact: John Glover telephone number (508) 353-0709
- B. Davis Colors 3700 East Olympic Blvd, Los Angeles, CA 90023 Phone: 800-356-4848 or 323-269-7311.
- C. Butterfield Color: 625 West Illinois Avenue, Aurora, IL 60506 Phone: (800) 282-3388

# 2.02 MATERIALS:

- A. Colored Admixture for Integrally Colored Concrete:
  - 1. Chromix P<sup>®</sup> Admixture and Chromix ML<sup>®</sup>; L. M. Scofield Company;
  - 2. Davis Colors Powder Pigment or Mix Ready.
  - 3. Butterfield Color: Uni-Mix<sup>®</sup> Integral Concrete Colorant.
  - 4. Admixture shall be a colored, water-reducing, admixture containing no calcium chloride with coloring agents that are limeproof and ultra-violet resistant.
  - 5. Colored admixture shall conform to the requirements of ACI 303.1, ASTM C979, ASTM C494 and ASSHTO M194.
- B. Curing Compound for Integrally Colored Concrete: Curing compound shall comply with ASTM C309 and be of same manufacturer as colored admixture, for use with integrally colored concrete.
  - 1. Exterior Integrally Colored Concrete: Lithochrome<sup>®</sup> Colorwax; L. M. Scofield Company. Use to cure exterior flatwork that will be allowed to cure naturally with only occasional maintenance.
  - 2. Curing Compound for Flatwork: Davis Colors [W-1000 Clear Cure & Seal] [Color Seal II, tinted to match integrally colored concrete]; complying with ASTM C309 and designed for use on integrally colored concrete.
  - 3. Butterfield Curing & Sealing compound: Clear Guard® Cure and Seal
  - 4. Moist Curing Blankets: Disposable curing blankets specially designed for use on colored or decorative concrete and to keep surface of concrete moist for seven days.
- C. Curing and Sealing Compound: Cureseal-W<sup>™</sup> Semi-gloss; L. M. Scofield Company. Curing and sealing compound shall comply with ASTM C309 and be of same manufacturer as colored admixture, for use with integrally colored concrete.

- D. Substitutions: The use of products other than those specified will be considered providing that the Contractor requests its use in writing within 14-days prior to bid date. This request shall be accompanied by the following:
  - 1. A certificate of compliance from material manufacturer stating that proposed products meet or exceed requirements of this Section, including standards ACI 303.1, ASTM C979, ASTM C494 and AASHTO M194.
  - 2. Documented proof that proposed materials have a 10-year proven record of performance, confirmed by at least 5 local projects that Landscape Architect can examine.

# 2.03 COLORS:

- A. Concrete Color[s]:
  - 1. Cement: Color shall be gray or white.
  - 2. Sand: Color shall [be locally available natural sand or be manufactured white sand to match Landscape Architect's sample.
  - 3. Aggregate: Concrete producer's standard aggregate complying with specifications
  - 4. Colored Admixture: As selected by Landscape Architect from manufacturer's Color Chart.
- B. Curing Compound: Color to match integrally colored concrete.

# 2.04 CONCRETE MIX DESIGN:

- A. Provide cement content required to achieve 4,000 psi concrete strength.
  - 1. Refer to SECTION 03301 CAST IN PLACE CONCRETE.
- B. Slump of concrete shall be consistent throughout Project at 4-inches or less. At no time shall slump exceed 5-inches.
- C. Do not add calcium chloride to mix as it causes mottling and surface discoloration.
- D. Supplemental admixtures shall not be used unless approved by manufacturer.
- E. Do not add water to the mix in the field.
- F. Add colored admixture to concrete mix according to manufacturer's written instructions.

# PART 3 - EXECUTION

3.01 INSTALLATION:

- A. Install concrete according to requirements of Division 3 Section "Cast-In-Place Concrete."
- B. Do not add water to concrete mix in the field.
- C. Surfaces shall be finished uniformly with the following finish as required by Landscape Architect:
  - 1. Broomed: Pull broom across freshly floated concrete to produce medium texture in straight lines perpendicular to main line of traffic. Do not dampen brooms.
  - 2. Swirl: Float concrete. Work float flat on surface using pressure in swirling manner to produce series of uniform arcs and twists. Use aluminum or magnesium float to produce medium texture.
  - 3. Trowel: Precautions should be taken to ensure that the surface is uniformly troweled so that it will not be slippery. Do not over-trowel or burnish the surface.

# 3.02 CURING:

- A. Integrally Colored Concrete: Apply curing and sealing compound for integrally colored concrete according to manufacturer's instructions using manufacturer's recommended application techniques. Apply curing and sealing compound at consistent time for each pour to maintain close color consistency.
- B. Curing compound shall be same color as the colored concrete and supplied by same manufacturer of the colored admixture.
- C. Precautions shall be taken in hot weather to prevent plastic cracking resulting from excessively rapid drying at surface as described in CIP 5 *Plastic Shrinkage Cracking* published by the National Ready Mixed Concrete Association.
- D. Do not cover concrete with plastic sheeting.

# 3.03 TOLERANCES:

A. Minor variations in appearance of integrally colored concrete, which are similar to natural variations in color and appearance of uncolored concrete, are acceptable.

# END OF SECTION

#### SECTION 16010

### ELECTRICAL WORK - GENERAL PROVISIONS

#### PART 1 - GENERAL

#### 1.01 WORK INCLUDED:

- A. The work covered by this section of the specifications consists of furnishing all labor, equipment, appliances, materials and incidentals in connection with the installation of the complete electrical systems as herein specified and as shown on the drawings.
- B. It is not the intent that the drawings shall show every junction box, conduit, wire, fitting, device, accessory, etc., but the Contractor shall be required to furnish without additional expense all transportation, labor and materials necessary to complete the electrical systems in accordance with the best practice of the trade.
- C. Unless otherwise specified, materials of the same classifications, used for the same purpose shall be the product of the same manufacturer.
- D. The work shall include furnishing and installing the following items:
  - 1. Underground Primary and Secondary Services
  - 2. Grounding System
  - 3. Panelboards
  - 4. Raceways
  - 5. Feeder and Branch Circuit Conductors
  - 6. Solderless Lugs and Connectors
  - 7. Lighting fixtures
  - 8. Power pedestals
  - 9. Electric cabinets
  - 10. Conduit and wire for equipment and controls furnished under other divisions of the specifications, when shown on the electrical plans.
- E. Electric Service and Metering

The power company serving this project is Eversource.

- 1. Secondary conduit wiring and metering will be by the Contractor.
- 2. Arrangements shall be made with the power company for obtaining service. All cost for overhead line extensions and work required for these services including metering cost shall be obtained from the power company. The Contractor shall include in his bid and shall pay this money to the power company. All work involving the service and metering shall be as approved by the power company.
- F. Interpretation of Drawings
  - 1. The Drawings are diagrammatic only and are not intended to show exact locations of outlets and conduit runs.
  - 2. All three-phase circuits shall be run in separate conduits unless otherwise shown on the Drawings.
  - 3. The Contractor shall verify with the Engineer the exact locations and mounting heights of lighting fixtures, switches and receptacles prior to installation.
  - 4. Any work installed contrary to Contract Documents, or without approval by the Engineer, shall be changed or replaced as required by the Engineer and no extra compensation will be allowed the Contractor for making these changes.
  - 5. The locations of equipment, fixtures, and similar devices shown on the Drawings are approximate only. Exact locations shall be as approved by the Engineer during construction. The Contractor shall obtain in the field all information relevant to the placing of electrical work and in case of any interference with other work, shall proceed as required by the Engineer and shall furnish all labor and materials necessary to complete the work in an approved manner.
  - 6. Surface mounted panel boxes, junction boxes, conduit, etc., shall be supported by spacers to provide a clearance between wall and equipment.
  - 7. The number of conductors shown on the Drawings are not necessarily the correct number required. As many conductors as are required in each case shall be installed.

- 8. Unless otherwise specified, all conduits, wires, and cables and the support systems for the conduits and cables that are required to make the electrical connections to equipment shall be furnished and installed. All connections to equipment shall be made as shown, specified, and required and in accordance with the approved shop and setting drawings.
- 9. The Contractor shall verify, in the field, all measurements necessary for his work and shall assume responsibility for their accuracy.

### 1.02 LOCAL CONDITIONS:

A. Before submitting proposals, the Contractor is expected to inspect the site and survey the conditions to be encountered in the performance of the work. Failure to familiarize himself with the conditions shall not relieve the Contractor's responsibility for full completion of the work in accordance with the provisions of the Contract.

### 1.03 PERMITS AND INSPECTION:

- A. Permits, fees and notices shall be in accordance with the General Conditions.
- B. All work shall meet or exceed the latest requirements of all national, state, county, municipal and other authorities exercising jurisdiction over electrical construction at this project.
- C. All required permit and inspection certificates shall be obtained, paid for, and given to the Owner at the completion of the work.

### 1.04 CODES AND STANDARDS:

- A. Unless indicated or specified otherwise, materials and workmanship shall conform with the latest editions of the following codes, standards and specifications.
  - 1. Massachusetts Electrical Code
  - 2. National Bureau of Standards Handbook H-30 National Electrical Safety Code
  - 3. State and Local Codes, and all other authorities having jurisdiction
  - 4. Underwriter's Laboratories, Inc. (UL)
  - 5. American National Standards Institute, Inc.
  - 6. Institute of Electrical and Electronic Engineers (IEEE)

- 7. National Electrical Manufacturers Association (NEMA)
- 8. National Board of Fire Underwriters
- 9. International Municipal Signal Association (IMSA)
- 10. Insulated Power Cable Engineers Associated Specifications
- 11. American Society for Testing Materials Specifications

### 1.05 REVIEW OF MATERIALS:

- A. Material and Equipment Schedules. As soon as practicable and within thirty days after the date of notice to proceed and before commencement of installation of any materials or equipment, the Contractor shall submit to the Engineer six (6) complete Brochures for approval of materials, fixtures, and equipment to be incorporated in the work. The list shall include manufacturer's name, catalog numbers, cuts, diagrams, drawings, and such other descriptive data as may be required. No consideration will be given to a partial submittal from time to time. Approval of materials will be based on manufacturer's published ratings. Any materials, fixtures and equipment listed that are not in accordance with the specification requirements will be rejected.
- B. Substitutions: Substitution of material or equipment shall be in accordance with the General Conditions.
- C. Shop Drawings. Shop drawings shall be submitted to the Engineer for review in accordance with Division 1. Shop drawings shall be submitted for, but not limited to the following:
  - 1. Panelboards
  - 2. Wire and Cable
  - 3. Hangers and Supports
  - 4. Raceways
  - 5. Lighting fixtures
  - 6. Cabinets
- D. Submit the following information with all equipment shop drawings.

- 1. Manufacturer's certified scale drawings, cuts, or catalogs, including installation details and manufacturer's name.
- 2. Manufacturer's specifications, including certified performance characteristics and capacity ratings.
- 3. Electrical wiring diagrams and controls, where applicable.
- 4. Certificate of compliance with Code, where applicable.
- 5. Detail of all conduit stub-up with conduit size and dimensions from columns or walls.
- E. Equipment shop drawings and wiring diagrams must be prepared specifically for this installation. Standard factory wiring diagrams with a revision marked in ink for this installation will be accepted.
- F. All control and wiring diagrams shall be complete with the following description:
  - 1. Sequence of operation
  - 2. Sequence of interlocking
  - 3. Operation of alarms
  - 4. Legend
  - 5. Wiring Numbers
- G. All equipment shop drawings shall be properly identified and indicate the Article number of the specifications or the Drawing number which applies to the submitted item.
- H. Shop drawings for the items listed above shall be submitted for approval in accordance with the preceding paragraphs. The Engineer, however, reserves the right to require submittal of shop drawings on any other material or equipment to be installed under this Section not specifically listed above.

# 1.06 MINOR DEVIATIONS:

- A. The work as shown on the drawings is diagrammatic and is intended to show the work included and the arrangement of the various systems.
- B. It is not intended that the accompanying plans and specifications cover every detail of the required installation. Furnish and install equipment, materials and

labor as shown or specified, as are usually furnished, or as are needed to make a complete and satisfactory operating installation, whether mentioned or not, omitting only those items which are specifically excluded.

- C. Locations and mounting heights of equipment and/or devices as shown are approximately correct. The Engineer reserves the right to relocate any equipment or device prior to actual installation at no extra cost to the Owner.
- D. No deviation from layout shall be made without written approval from the Engineer.

#### 1.07 TEMPORARY LIGHT AND POWER:

A. The Contractor shall provide temporary light and power and pay all energy charges as described in Division 1.

### 1.08 ELECTRICAL REFERENCE SYMBOLS:

A. Symbols shown on the drawings shall approximate location of fixtures, outlet boxes, and conduit runs, and other equipment, unless otherwise detailed. The exact location shall be governed by structural conditions and obstructions. This is not to be construed to permit redesigning systems. Locate and install all boxes and equipment where they will be readily accessible.

### 1.09 PHASE IDENTIFICATION:

- A. The entire system of wiring shall be phased by color code as follows:
  - 1. Wires No. 6 AWG and smaller shall have a continuous colored outer covering.
  - 2. Wires larger than No. 6 AWG shall be identified at all points of termination by gummed tape, plastic tape, etc., applied to the wire.
  - 3. Bus bars in panelboards shall be properly identified by color as herein specified.
  - 4. Code colors for 277/480 volt systems shall be:
    - a. Phase A Black
    - b. Phase B Orange
    - c. Phase C Yellow

- 5. Code colors for 120/208 volt systems shall be:
  - a. Phase A Black
  - b. Phase B Red
  - c. Phase C Blue
- 6. Neutral wires shall be white or grey.
- 7. Equipment ground wires shall be green.
- 8. The same colors shall be used for the same phases throughout the entire project.

#### 1.10 PROTECTION AND CLEANING OF EQUIPMENT:

- A. All electrical equipment, upon receipt, shall be adequately stored and protected from damage.
- B. After installation, all electrical equipment shall be protected to prevent damage during the construction period. Openings in conduits and boxes shall be closed to prevent entrance of foreign materials.
- C. The interior of boxes and cabinets shall be left clean. Exposed surfaces shall be cleaned and plate surfaces polished.

### 1.11 OPERATION AND MAINTENANCE MANUALS:

- A. The Contractor shall furnish the Owner with three (3) copies of complete operating and maintenance manuals. Manuals shall include all equipment, maintenance instruction, parts list, warranties, schematic diagrams of control systems, and lubrication charts.
- B. Manuals shall contain only that information which specifically applies to this project, and all unrelated material shall be deleted. During the instruction period, herein specified, this manual shall be used and explained. Each copy of manual shall be clearly indexed and include a directory of all subcontractors and maintenance contractors, indicate the area of their responsibility, and list the name and telephone numbers of the responsible member of each organization. This material shall have a clear plastic protective shield over each sheet of data.
- C. Each manual shall be bound in an expandable plastic covered hard bound binder. Binders shall be three post type. The manual's front cover and side cover shall be

stamped "Operation and Maintenance Manual -- Electrical Systems" along with the project title.

#### 1.12 OPERATING AND MAINTENANCE INSTRUCTIONS:

A. A competent Engineer shall be provided by the Contractor to instruct operating personnel in the operation and maintenance of equipment and systems.

### 1.13 SPARE PARTS DATA:

A. The Contractor shall furnish a complete list of recommended spare parts and supplies for the equipment furnished with current unit prices and source of supply.

### 1.14 TESTS:

- A. The Electrical Subcontractor shall perform all tests at the completion of the work and the results furnished to the Owner and Engineer in writing. Tests shall include, but not be limited to: all systems test free of shorts or grounds, proper neutral connections, ground system resistance, secondary voltages at main distribution panel, power panels and lighting panels.
- B. Upon completion of all work, the Electrical Subcontractor shall furnish, in duplicate, certificates of inspections from all inspectors and authorities having jurisdiction, notarized letters from the manufacturers stating that authorized Factory Engineers or agents have inspected and tested the installation of their respective systems and found same to be in satisfactory operating condition.
- C. Furnish all labor, material, instruments, supplies and services and bear all costs for the accomplishment of the tests.

### 1.15 GUARANTEE:

A. The Contractor shall guarantee equipment and performance of the installation and equipment in accordance with the GENERAL CONDITIONS.

### PART 2 - PRODUCTS

### 2.01 MATERIALS:

A. The materials used in all systems shall be new, unused and as hereinafter specified. All materials where not specified shall be of the very best of their respective kinds. Samples of materials or manufacturer's specification shall be submitted for approval as required by the Engineer.

- B. Materials and equipment used shall be U.L. listed wherever such approved materials and equipment is available.
- C. Electrical equipment shall at all times during construction be adequately protected against mechanical injury or damage by water. If any apparatus has been damaged, such damage shall be repaired by the Contractor at his cost and expense. If any apparatus has been subject to possible damage by water, it shall be thoroughly dried out and put through such special tests as required by the Engineer, at the cost and expense of the Contractor, or shall be replaced by the Contractor at his own expense.

### PART 3 EXECUTION

### 3.01 INSTALLATION

- A. All work shall be executed in full accordance with the National Electrical Code and local rulings. Should any work be performed contrary to said rulings, ordinances and regulations, this Contractor shall bear full responsibility for such violations and assume all costs arising therefrom.
- B. Load Balance. Check the load balance on the phases of the various systems and reconnect where necessary as approved by the Engineer to provide equal division of the loads between the phases of the various systems.
- C. Before starting the work, confer with all other trades relative to the location of pipes, and apparatus or fixtures to be installed by them and select locations for the work which will avoid possible conflicts with the work of other trades involved. All differences or conflicting conditions concerning the work shall be called to the attention of the Engineer for adjustment before starting work. For such work performed or materials installed in violation of the above clause the work shall be readjusted to the complete satisfaction of the Engineer at the sole expense of the Electrical Subcontractor.

### D. Cleanup

- 1. This Contractor shall cooperate with other workmen and with the General Contractor in the daily removal of debris from the work site.
- 2. This Contractor shall leave "broom clean" all areas where he has interrupted or completed his work.
- 3. He shall cooperate with the General Contractor in good housekeeping procedures.

4. At the completion of his work, prior to the final inspection, this Contractor shall clean all devices, plates, fixtures, glassware, switches, cabinets, exposed conduits, fittings, etc. and shall have the premises in a thoroughly clean condition.

### END OF SECTION

# SECTION 16050

### BASIC ELECTRICAL MATERIALS AND METHODS

#### PART 1 - GENERAL

#### 1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

#### 1.02 SUMMARY

- A. This Section includes the following:
  - 1. Raceways.
  - 2. Building wire and connectors.
  - 3. Supporting devices for electrical components.
  - 4. Electrical identification.
  - 5. Electricity-metering components.
  - 6. Concrete equipment bases.
  - 7. Cutting and patching for electrical construction.
  - 8. Touchup painting.

#### 1.03 DEFINITIONS

- A. EMT: Electrical metallic tubing.
- B. FMC: Flexible metal conduit.
- C. IMC: Intermediate metal conduit.
- D. LFMC: Liquidtight flexible metal conduit.
- E. RNC: Rigid nonmetallic conduit.

#### 1.04 SUBMITTALS

- A. Product Data: For electricity-metering equipment.
- B. Shop Drawings: Dimensioned plans and sections or elevation layouts of electricitymetering equipment.

C. Field Test Reports: Indicate and interpret test results for compliance with performance requirements.

### 1.05 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- B. Comply with NFPA 70.

### 1.06 COORDINATION

- A. Sequence, coordinate, and integrate installing electrical materials and equipment for efficient flow of the Work.
- B. Coordinate electrical service connections to components furnished by utility companies.
  - 1. Coordinate installation and connection of exterior underground and overhead utilities and services, including provision for electricity-metering components.
  - 2. Comply with requirements of authorities having jurisdiction and of utility company providing electrical power and other services.
- C. Where electrical identification devices are applied to field-finished surfaces, coordinate installation of identification devices with completion of finished surface.

### PART 2 - PRODUCTS

- 2.01 RACEWAYS
  - A. EMT: ANSI C80.3, zinc-coated steel, with set-screw or compression fittings.
  - B. FMC: Zinc-coated steel.
  - C. IMC: ANSI C80.6, zinc-coated steel, with threaded fittings.
  - D. LFMC: Zinc-coated steel with sunlight-resistant and mineral-oil-resistant plastic jacket.
  - E. RNC: NEMA TC 2, Schedule 40 PVC, with NEMA TC3 fittings.
  - F. RSC: Galvanized rigid steel
  - G. Raceway Fittings: Specifically designed for the raceway type with which used.
- 2.02 CONDUCTORS

- A. Conductors, No. 10 AWG and Smaller: Solid or stranded copper.
- B. Conductors, Larger Than No. 10 AWG: Stranded copper.
- C. Insulation: Thermoplastic, rated at 75 deg C minimum.
- D. Wire Connectors and Splices: Units of size, ampacity rating, material, type, and class suitable for service indicated.

### 2.03 SUPPORTING DEVICES

- A. Material: Cold-formed steel, with corrosion-resistant coating acceptable to authorities having jurisdiction.
- B. Metal Items for Use Outdoors or in Damp Locations: Hot-dip galvanized steel.
- C. Raceway and Cable Supports: Manufactured clevis hangers, riser clamps, straps, threaded C-clamps with retainers, ceiling trapeze hangers, wall brackets, and spring-steel clamps or click-type hangers.
- D. Pipe Sleeves: ASTM A 53, Type E, Grade A, Schedule 40, galvanized steel, plain ends.
- E. Cable Supports for Vertical Conduit: Factory-fabricated assembly consisting of threaded body and insulating wedging plug for non-armored electrical cables in riser conduits. Plugs have number and size of conductor gripping holes as required to suit individual risers. Body constructed of malleable-iron casting with hot-dip galvanized finish.
- F. Expansion Anchors: Carbon-steel wedge or sleeve type.
- G. Toggle Bolts: All-steel springhead type.
- H. Powder-Driven Threaded Studs: Heat-treated steel.

### 2.04 ELECTRICAL IDENTIFICATION

- A. Identification Devices: A single type of identification product for each application category. Use colors prescribed by ANSI A13.1, NFPA 70, and these Specifications.
- B. Raceway and Cable Labels: Comply with ANSI A13.1, Table 3, for minimum size of letters for legend and minimum length of color field for each raceway and cable size.
  - 1. Type: Pre-tensioned, wraparound plastic sleeves. Flexible, preprinted, colorcoded, acrylic band sized to suit the diameter of the item it identifies.
  - 2. Type: Preprinted, flexible, self-adhesive, vinyl. Legend is over laminated with a clear, weather- and chemical-resistant coating.
  - 3. Color: Black letters on orange background.

- 4. Legend: Indicates voltage.
- C. Colored Adhesive Marking Tape for Raceways, Wires, and Cables: Self-adhesive vinyl tape, not less than 1 inch wide by 3 mils thick.
- D. Underground Warning Tape: Permanent, bright-colored, continuous-printed, vinyl tape with the following features:
  - 1. Not less than 6 inches wide by 4 mils thick.
  - 2. Compounded for permanent direct-burial service.
  - 3. Embedded continuous metallic strip or core.
  - 4. Printed legend that indicates type of underground line.
- E. Tape Markers for Wire: Vinyl or vinyl-cloth, self-adhesive, wraparound type with preprinted numbers and letters.
- F. Color-Coding Cable Ties: Type 6/6 nylon, self-locking type. Colors to suit coding scheme.
- G. Engraved-Plastic Labels, Signs, and Instruction Plates: Engraving stock, melamine plastic laminate punched or drilled for mechanical fasteners 1/16-inch minimum thickness for signs up to 20 sq. in. and 1/8-inch minimum thickness for larger sizes. Engraved legend in black letters on white background.
- H. Exterior Warning and Caution Signs: Comply with 29 CFR, Chapter XVII, Part 1910.145. Weather-resistant, nonfading, preprinted, cellulose-acetate butyrate signs with 0.0396-inch, galvanized-steel backing, with colors, legend, and size appropriate to the application. 1/4-inch grommets in corners for mounting.
- I. Fasteners for Nameplates and Signs: Self-tapping, stainless-steel screws or No. 10/32 stainless-steel machine screws with nuts and flat and lock washers.

### 2.05 EQUIPMENT FOR UTILITY COMPANY'S ELECTRICITY METERING

- A. Current-Transformer Cabinets: Comply with requirements of electrical power utility company.
- B. Meter Sockets: Comply with requirements of electrical power utility company.

### 2.06 CONCRETE BASES

- A. Concrete Forms and Reinforcement Materials: As specified in Division 3 Section "Cast-in-Place Concrete."
- B. Concrete: 3000-psi, 28-day compressive strength as specified in Division 3 Section "Cast-in-Place Concrete."

### 2.07 TOUCHUP PAINT

- A. For Equipment: Equipment manufacturer's paint selected to match installed equipment finish.
- B. Galvanized Surfaces: Zinc-rich paint recommended by item manufacturer.

# PART 3 - EXECUTION

### 3.01 ELECTRICAL EQUIPMENT INSTALLATION

- A. Headroom Maintenance: If mounting heights or other location criteria are not indicated, arrange and install components and equipment to provide the maximum possible headroom.
- B. Materials and Components: Install level, plumb, and parallel and perpendicular to other building systems and components, unless otherwise indicated.
- C. Equipment: Install to facilitate service, maintenance, and repair or replacement of components. Connect for ease of disconnecting, with minimum interference with other installations.
- D. Right of Way: Give to raceways and piping systems installed at a required slope.

# 3.02 RACEWAY APPLICATION

- A. Use the following raceways for outdoor installations:
  - 1. Underground, Single Run: RNC.
  - 2. Underground, Grouped: RNC.
  - 3. Connection to Vibrating Equipment: LFMC.
  - 4. Boxes and Enclosures: NEMA 250, Type 3R or Type 4.
- B. Use the following raceways for indoor installations:
  - 1. Damp or Wet Locations: RSC.
  - 2. Boxes and Enclosures: NEMA 250, Type 1, unless otherwise indicated.

# 3.03 RACEWAY AND CABLE INSTALLATION

- A. Use temporary raceway caps to prevent foreign matter from entering.
- B. Make conduit bends and offsets so ID is not reduced. Keep legs of bends in the same plane and straight legs of offsets parallel, unless otherwise indicated.

- C. Use raceway and cable fittings compatible with raceways and cables and suitable for use and location.
- D. Install pull wires in empty raceways. Use No. 14 AWG zinc-coated steel or monofilament plastic line with not less than 200-lb tensile strength. Leave at least 12 inches of slack at each end of the pull wire.
- E. Connect motors and equipment subject to vibration, noise transmission, or movement with a maximum of 72-inch flexible conduit. Install LFMC in wet or damp locations. Install separate ground conductor across flexible connections.

### 3.04 WIRING METHODS FOR POWER, LIGHTING, AND CONTROL CIRCUITS

- A. Feeders: Type THHN/THWN insulated conductors in raceway.
- B. Underground Feeders and Branch Circuits: Type THWN or single-wire, Type UF insulated conductors in raceway.
- C. Branch Circuits: Type THHN/THWN insulated conductors in raceway.
- D. Remote-Control Signaling and Power-Limited Circuits: Type THHN/THWN insulated conductors in raceway for Classes 1, 2, and 3, unless otherwise indicated.

### 3.05 WIRING INSTALLATION

- A. Install splices and taps that are compatible with conductor material and that possess equivalent or better mechanical strength and insulation ratings than un-spliced conductors.
- B. Install wiring at outlets with at least 12 inches of slack conductor at each outlet.
- C. Connect outlet and component connections to wiring systems and to ground. Tighten electrical connectors and terminals, according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A.

### 3.06 ELECTRICAL SUPPORTING DEVICE APPLICATION

- A. Damp Locations and Outdoors: Hot-dip galvanized materials or nonmetallic, U-channel system components.
- B. Dry Locations: Steel materials.
- C. Support Clamps for PVC Raceways: Click-type clamp system.
- D. Selection of Supports: Comply with manufacturer's written instructions.

E. Strength of Supports: Adequate to carry present and future loads, times a safety factor of at least four; minimum of 200-lb design load.

### 3.07 SUPPORT INSTALLATION

- A. Install support devices to securely and permanently fasten and support electrical components.
- B. Install individual and multiple raceway hangers and riser clamps to support raceways. Provide U-bolts, clamps, attachments, and other hardware necessary for hanger assemblies and for securing hanger rods and conduits.
- C. Support parallel runs of horizontal raceways together on trapeze- or bracket-type hangers.
- D. Size supports for multiple raceway installations so capacity can be increased by a 25 percent minimum in the future.
- E. Support individual horizontal raceways with separate, malleable-iron pipe hangers or clamps.
- F. Install 1/4-inch diameter or larger threaded steel hanger rods, unless otherwise indicated.
- G. Arrange supports in vertical runs so the weight of raceways and enclosed conductors is carried entirely by raceway supports, with no weight load on raceway terminals.
- H. Simultaneously install vertical conductor supports with conductors.
- I. Install metal channel racks for mounting cabinets, panelboards, control enclosures, pull and junction boxes, and other devices unless components are mounted directly to structural elements of adequate strength.

### 3.08 IDENTIFICATION MATERIALS AND DEVICES

- A. Install at locations for most convenient viewing without interference with operation and maintenance of equipment.
- B. Coordinate names, abbreviations, colors, and other designations used for electrical identification with corresponding designations indicated in the Contract Documents or required by codes and standards. Use consistent designations throughout Project.
- C. Self-Adhesive Identification Products: Clean surfaces before applying.
- D. Identify raceways and cables with color banding as follows:

- 1. Bands: Pre-tensioned, snap-around, colored plastic sleeves or colored adhesive marking tape. Make each color band 2 inches wide, completely encircling conduit, and place adjacent bands of two-color markings in contact, side by side.
- 2. Band Locations: At changes in direction, at penetrations of walls and floors, at 50-foot maximum intervals in straight runs, and at 25-foot maximum intervals in congested areas.
- E. Tag and label circuits designated to be extended in the future. Identify source and circuit numbers in each cabinet, pull and junction box, and outlet box. Color-coding may be used for voltage and phase identification.
- F. Install continuous underground plastic markers during trench backfilling, for exterior underground power, control, signal, and communication lines located directly above power and communication lines. Locate 6 to 8 inches below finished grade. If width of multiple lines installed in a common trench or concrete envelope does not exceed 16 inches, overall, use a single line marker.
- G. Install warning, caution, and instruction signs where required to comply with 29 CFR, Chapter XVII, Part 1910.145, and where needed to ensure safe operation and maintenance of electrical systems and of items to which they connect. Install engraved plastic-laminated instruction signs with approved legend where instructions are needed for system or equipment operation. Install metal-backed butyrate signs for outdoor items.

# 3.09 UTILITY COMPANY ELECTRICITY-METERING EQUIPMENT

A. Install equipment according to utility company's written requirements. Provide grounding and empty conduits as required by utility company.

# 3.10 CONCRETE BASES

A. Construct concrete bases of dimensions indicated, but not less than 4 inches larger, in both directions, than supported unit. Follow supported equipment manufacturer's anchorage recommendations and setting templates for anchor-bolt and tie locations, unless otherwise indicated. Use 3000-psi, 28-day compressive-strength concrete and reinforcement as specified in Division 3 Section "Cast-in-Place Concrete."

# 3.11 FIELD QUALITY CONTROL

- A. Inspect installed components for damage and faulty work, including the following:
  - 1. Raceways.
  - 2. Building wire and connectors.
  - 3. Supporting devices for electrical components.
  - 4. Electrical identification.

- 5. Electricity-metering components.
- 6. Concrete bases.
- 7. Cutting and patching for electrical construction.
- 8. Touchup painting.

# 3.12 REFINISHING AND TOUCHUP PAINTING

- A. Refinish and touch up paint. Paint materials and application requirements as follows:
  - 1. Clean damaged and disturbed areas and apply primer, intermediate, and finish coats to suit the degree of damage at each location.
  - 2. Follow paint manufacturer's written instructions for surface preparation and for timing and application of successive coats.
  - 3. Repair damage to galvanized finishes with zinc-rich paint recommended by manufacturer.
  - 4. Repair damage to PVC or paint finishes with matching touchup coating recommended by manufacturer.

### 3.13 CLEANING AND PROTECTION

- A. On completion of installation, including outlets, fittings, and devices, inspect exposed finish. Remove burrs, dirt, paint spots, and construction debris.
- B. Protect equipment and installations and maintain conditions to ensure that coatings, finishes, and cabinets are without damage or deterioration at time of Substantial Completion.

# END OF SECTION

# SECTION 16123

# CONDUCTORS AND CABLES

### PART 1 - GENERAL

#### 1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

#### 1.02 SUMMARY

A. This Section includes building wires and cables and associated connectors, splices, and terminations for wiring systems rated 600 V and less.

#### 1.03 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Qualification Data: For testing agency.
- C. Field Quality-Control Test Reports: By the Contractor.

### 1.04 QUALITY ASSURANCE

- A. Testing Agency Qualifications: Testing agency as defined by OSHA in 29 CFR 1910.7 or a member company of the International Electrical Testing Association and that is acceptable to authorities having jurisdiction.
- B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- C. Comply with NFPA 70.

### PART 2 - PRODUCTS

### 2.01 MANUFACTURERS

A. In other Part 2 articles where subparagraph titles below introduce lists, the following requirements apply for product selection:

#### 16123 - 1 CONDUCTORS AND CABLES

- 1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the manufacturers specified.
- 2. Manufacturers: Subject to compliance with requirements, provide products by the manufacturers specified.

# 2.02 CONDUCTORS AND CABLES

- A. Manufacturers:
  - 1. Alcan Aluminum Corporation; Alcan Cable Div.
  - 2. American Insulated Wire Corp.; a Leviton Company.
  - 3. General Cable Corporation.
  - 4. Senator Wire & Cable Company.
  - 5. Southwire Company.
- B. Refer to Part 3 "Conductor and Insulation Applications" Article for insulation type, cable construction, and ratings.
- C. Conductor Material: Copper solid conductor for No. 10 AWG and smaller, stranded for No. 8 AWG and larger.
- D. Conductor Insulation Types: Type THHN-THWN, XHHW, UF complying with NEMA WC 5 or 7.

### 2.03 CONNECTORS AND SPLICES

- A. Manufacturers:
  - 1. AFC Cable Systems, Inc.
  - 2. AMP Incorporated/Tyco International.
  - 3. Hubbell/Anderson.
  - 4. O-Z/Gedney; EGS Electrical Group LLC.
  - 5. 3M Company; Electrical Products Division.
- B. Description: Factory-fabricated connectors and splices of size, ampacity rating, material, type, and class for application and service indicated.

# PART 3 - EXECUTION

- 3.01 CONDUCTOR AND INSULATION APPLICATIONS
  - A. Service Entrance: Type XHHW, single conductors in raceway.
  - B. Exposed Feeders: Type THHN-THWN, single conductors in raceway

C. Exposed Branch Circuit: Type THHN-THWN, single conductors in raceway.

### 3.02 INSTALLATION

- A. Use manufacturer-approved pulling compound or lubricant where necessary; compound used must not deteriorate conductor or insulation. Do not exceed manufacturer's recommended maximum pulling tensions and sidewall pressure values.
- B. Use pulling means; including fish tape, cable, rope, and basket-weave wire/cable grips that will not damage cables or raceway.
- C. Support cables according to Division 16 Section "Basic Electrical Materials and Methods."
- D. Identify and color-code conductors and cables according to Division 16 Section.

### 3.03 CONNECTIONS

- A. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.
- B. Make splices and taps that are compatible with conductor material and that possess equivalent or better mechanical strength and insulation ratings than unspliced conductors.
  - 1. Use oxide inhibitor in each splice and tap if existing aluminum conductors are encounted that require connection.
- C. Wiring at Outlets: Install conductor at each outlet, with at least 6 inches of slack.

### 3.04 FIELD QUALITY CONTROL

- A. Testing: Engage a qualified testing agency to perform the following field qualitycontrol testing:
- B. Testing: Perform the following field quality-control testing:
  - 1. After installing conductors and cables and before electrical circuitry has been energized, test for compliance with requirements.
  - 2. Perform each electrical test and visual and mechanical inspection stated in NETA ATS, Section 7.3.1. Certify compliance with test parameters.
- C. Test Reports: Prepare a written report to record the following:
  - 1. Test procedures used.

- 2. Test results that comply with requirements.
- 3. Test results that do not comply with requirements and corrective action taken to achieve compliance with requirements.

# END OF SECTION

### SECTION 16130

### RACEWAYS AND BOXES

#### PART 1 - GENERAL

#### 1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

#### 1.02 SUMMARY

- A. This Section includes raceways, fittings, boxes, enclosures, and cabinets for electrical wiring.
- B. Related Sections include the following:
  - 1. Division 16 Section "Basic Electrical Materials and Methods" for supports, anchors, and identification products.

#### 1.03 DEFINITIONS

- A. EMT: Electrical metallic tubing.
- B. ENT: Electrical nonmetallic tubing.
- C. FMC: Flexible metal conduit.
- D. RMC: Rigid metal conduit.
- E. LFMC: Liquidtight flexible metal conduit.
- F. LFNC: Liquidtight flexible nonmetallic conduit.
- G. RNC: Rigid nonmetallic conduit.

#### 1.04 SUBMITTALS

A. Product Data: For surface raceways, wireways and fittings, floor boxes, hinged-cover enclosures, and cabinets.

- B. Shop Drawings: Show fabrication and installation details of components for raceways, fittings, boxes, enclosures, and cabinets.
- C. Shop Drawings:
  - 1. Detail assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.

### 1.05 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- B. Comply with NFPA 70.

# PART 2 - PRODUCTS

### 2.01 MANUFACTURERS

- A. In other Part 2 articles where subparagraph titles below introduce lists, the following requirements apply for product selection:
  - 1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the manufacturers specified.
  - 2. Manufacturers: Subject to compliance with requirements, provide products by the manufacturers specified.

### 2.02 METAL CONDUIT AND TUBING

- A. Available Manufacturers:
  - 1. AFC Cable Systems, Inc.
  - 2. Grinnell Co./Tyco International; Allied Tube and Conduit Div.
  - 3. LTV Steel Tubular Products Company.
  - 4. O-Z Gedney; Unit of General Signal.
  - 5. Wheatland Tube Co.
- B. Rigid Steel Conduit: ANSI C80.1.
- C. Aluminum Rigid Conduit: ANSI C80.5.

- D. IMC: ANSI C80.6.
- E. Plastic-Coated Steel Conduit and Fittings: NEMA RN 1.
- F. Plastic-Coated IMC and Fittings: NEMA RN 1.
- G. FMC: Zinc-coated steel.
- H. LFMC: Flexible steel conduit with PVC jacket.
- I. Fittings: NEMA FB 1; compatible with conduit and tubing materials.

### 2.03 NONMETALLIC CONDUIT AND TUBING

- A. Available Manufacturers:
  - 1. American International.
  - 2. Cantex Inc.
  - 3. Certainteed Corp.; Pipe & Plastics Group.
  - 4. Condux International.
  - 5. RACO; Division of Hubbell, Inc.
  - 6. Spiralduct, Inc./AFC Cable Systems, Inc.
  - 7. Thomas & Betts Corporation.
- B. ENT: NEMA TC 13.
- C. RNC: NEMA TC 2, Schedule 40 and Schedule 80 PVC.
- D. ENT and RNC Fittings: NEMA TC 3; match to conduit or tubing type and material.
- E. LFNC: UL 1660.

### 2.04 SURFACE RACEWAYS

- A. Surface Metal Raceways: Galvanized steel with snap-on covers. Finish with manufacturer's standard prime coating.
  - 1. Available Manufacturers:
    - a. Airey-Thompson Sentinel Lighting; Wiremold Company (The).
    - b. Thomas & Betts Corporation.
    - c. Walker Systems, Inc.; Wiremold Company (The).
    - d. Wiremold Company (The); Electrical Sales Division.
- B. Surface Nonmetallic Raceways: Two-piece construction, manufactured of rigid PVC compound with matte texture and **manufacturer's standard** color.

- 1. Avalable Manufacturers:
  - a. Butler Manufacturing Co.; Walker Division.
  - b. Enduro Composite Systems.
  - c. Hubbell, Inc.; Wiring Device Division.
  - d. Lamson & Sessions; Carlon Electrical Products.
  - e. Panduit Corp.
  - f. Walker Systems, Inc.; Wiremold Company (The).
  - g. Wiremold Company (The); Electrical Sales Division.
- C. Types, sizes, and channels as indicated and required for each application, with fittings that match and mate with raceways.

### 2.05 BOXES, ENCLOSURES, AND CABINETS

- A. Available Manufacturers:
  - 1. Cooper Crouse-Hinds; Div. of Cooper Industries, Inc.
  - 2. Emerson/General Signal; Appleton Electric Company.
  - 3. Hoffman.
  - 4. Hubbell, Inc.; Killark Electric Manufacturing Co.
  - 5. O-Z/Gedney; Unit of General Signal.
  - 6. RACO; Division of Hubbell, Inc.
  - 7. Robroy Industries, Inc.; Enclosure Division.
  - 8. Spring City Electrical Manufacturing Co.
  - 9. Thomas & Betts Corporation.
- B. Sheet Metal Outlet and Device Boxes: NEMA OS 1.
- C. Cast-Metal Outlet and Device Boxes: NEMA FB 1, Type FD, with gasketed cover.
- D. Nonmetallic Outlet and Device Boxes: NEMA OS 2.
- E. Small Sheet Metal Pull and Junction Boxes: NEMA OS 1.
- F. Cast-Metal Pull and Junction Boxes: NEMA FB 1, cast aluminum with gasketed cover.
- G. Hinged-Cover Enclosures: NEMA 250, Type 1, with continuous hinge cover and flush latch.
  - 1. Metal Enclosures: Steel, finished inside and out with manufacturer's standard enamel.
  - 2. Nonmetallic Enclosures: Plastic, finished inside with radio-frequency-resistant paint.
- H. Cabinets: NEMA 250, Type 1, galvanized steel box with removable interior panel and removable front, finished inside and out with manufacturer's standard enamel. Hinged

door in front cover with flush latch and concealed hinge. Key latch to match panelboards. Include metal barriers to separate wiring of different systems and voltage and include accessory feet where required for freestanding equipment.

#### 2.06 FACTORY FINISHES

A. Finish: For raceway, enclosure, or cabinet components, provide manufacturer's standard paint applied to factory-assembled surface raceways, enclosures, and cabinets before shipping.

#### PART 3 - EXECUTION

#### 3.01 RACEWAY APPLICATION

- A. Outdoors:
  - 1. Exposed: Rigid steel.
  - 2. Concealed: Rigid steel.
  - 3. Underground, Single Run: RNC.
  - 4. Underground, Grouped: RNC.
  - 5. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): LFMC.
  - 6. Boxes and Enclosures: NEMA 250, Type 4.
- B. Minimum Raceway Size: 3/4-inch trade size.
- C. Raceway Fittings: Compatible with raceways and suitable for use and location.
  - 1. Rigid Steel Conduit: Use threaded rigid steel conduit fittings, unless otherwise indicated.
  - 2. PVC Externally Coated, Rigid Steel Conduits: Use only fittings approved for use with that material. Patch all nicks and scrapes in PVC coating after installing conduits.
- D. Do not install aluminum conduits embedded in or in contact with concrete.

#### 3.02 INSTALLATION

- A. Complete raceway installation before starting conductor installation.
- B. Support raceways as specified in Division 16 Section.
- C. Install temporary closures to prevent foreign matter from entering raceways.

- D. Protect stub-ups from damage where conduits rise through floor slabs. Arrange so curved portions of bends are not visible above the finished slab.
- E. Make bends and offsets so ID is not reduced. Keep legs of bends in the same plane and keep straight legs of offsets parallel, unless otherwise indicated.
- F. Install exposed raceways parallel or at right angles to nearby surfaces or structural members and follow surface contours as much as possible.
  - 1. Run parallel or banked raceways together on common supports.
  - 2. Make parallel bends in parallel or banked runs. Use factory elbows only where elbows can be installed parallel; otherwise, provide field bends for parallel raceways.
- G. Join raceways with fittings designed and approved for that purpose and make joints tight.
  - 1. Use insulating bushings to protect conductors.
- H. Tighten set screws of threadless fittings with suitable tools.
- I. Terminations:
  - 1. Where raceways are terminated with locknuts and bushings, align raceways to enter squarely and install locknuts with dished part against box. Use two locknuts, one inside and one outside box.
  - 2. Where raceways are terminated with threaded hubs, screw raceways or fittings tightly into hub so end bears against wire protection shoulder. Where chase nipples are used, align raceways so coupling is square to box; tighten chase nipple so no threads are exposed.
- J. Install pull wires in empty raceways. Use polypropylene or monofilament plastic line with not less than 200-lb tensile strength. Leave at least 12 inches of slack at each end of pull wire.
- K. Install raceway sealing fittings at suitable, approved, and accessible locations and fill them with UL-listed sealing compound. For concealed raceways, install each fitting in a flush steel box with a blank cover plate having a finish similar to that of adjacent plates or surfaces. Install raceway sealing fittings at the following points:
  - 1. Where conduits pass from warm to cold locations, such as boundaries of refrigerated spaces.
  - 2. Where otherwise required by NFPA 70.
- L. Stub-up Connections: Extend conduits through concrete floor for connection to freestanding equipment. Install with an adjustable top or coupling threaded inside for plugs set flush with finished floor. Extend conductors to equipment with rigid steel

conduit; FMC may be used 6 inches above the floor. Install screwdriver-operated, threaded plugs flush with floor for future equipment connections.

- M. Flexible Connections: Use maximum of 72 inches of flexible conduit for recessed and semirecessed lighting fixtures; for equipment subject to vibration, noise transmission, or movement; and for all motors. Use LFMC in damp or wet locations. Install separate ground conductor across flexible connections.
- N. Surface Raceways: Install a separate, green, ground conductor in raceways from junction box supplying raceways to receptacle or fixture ground terminals.
- O. Install hinged-cover enclosures and cabinets plumb. Support at each corner.

#### 3.03 PROTECTION

- A. Provide final protection and maintain conditions that ensure coatings, finishes, and cabinets are without damage or deterioration at time of Substantial Completion.
  - 1. Repair damage to galvanized finishes with zinc-rich paint recommended by manufacturer.
  - 2. Repair damage to PVC or paint finishes with matching touchup coating recommended by manufacturer.

#### 3.04 CLEANING

A. After completing installation of exposed, factory-finished raceways and boxes, inspect exposed finishes and repair damaged finishes.

#### END OF SECTION

#### SECTION 16442

#### PANELBOARDS

#### PART 1 - GENERAL

#### 1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

#### 1.02 SUMMARY

- A. This Section includes load centers and panelboards, overcurrent protective devices, and associated auxiliary equipment rated 600 V and less for the following types:
  - 1. Lighting and appliance branch-circuit panelboards.

#### 1.03 DEFINITIONS

- A. EMI: Electromagnetic interference.
- B. GFCI: Ground-fault circuit interrupter.
- C. RFI: Radio-frequency interference.
- D. RMS: Root mean square.
- E. SPDT: Single pole, double throw.
- F. TVSS: Transient voltage surge suppressor.

#### 1.04 SUBMITTALS

- A. Product Data: For each type of panelboard, overcurrent protective device, TVSS device, accessory, and component indicated. Include dimensions and manufacturers' technical data on features, performance, electrical characteristics, ratings, and finishes.
- B. Shop Drawings: For each panelboard and related equipment.
  - 1. Dimensioned plans, elevations, sections, and details. Show tabulations of installed devices, equipment features, and ratings. Include the following:
    - a. Enclosure types and details for types other than NEMA 250, Type 1.

#### 16442 - 1 PANELBOARDS

- b. Bus configuration, current, and voltage ratings.
- c. Short-circuit current rating of panelboards and overcurrent protective devices.
- d. UL listing for series rating of installed devices.
- e. Features, characteristics, ratings, and factory settings of individual overcurrent protective devices and auxiliary components.
- 2. Wiring Diagrams: Diagram power, signal, and control wiring and differentiate between manufacturer-installed and field-installed wiring.
- C. Manufacturer Seismic Qualification Certification: Submit certification that panelboards, overcurrent protective devices, accessories, and components will withstand seismic forces, Include the following:
  - 1. Basis of Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculation.
  - 2. The term "withstand" means "the unit will remain in place without separation of internal and external parts during a seismic event."
  - 3. The term "withstand" means "the unit will remain in place without separation of internal and external parts during a seismic event and the unit will be fully operational after the event."
  - 4. Dimensioned Outline Drawings of Equipment Unit: Identify center of gravity and locate and describe mounting and anchorage provisions.
  - 5. Detailed description of equipment anchorage devices on which the certification is based and their installation requirements.
- D. Qualification Data: Submit data for testing agencies indicating that they comply with qualifications specified in "Quality Assurance" Article.
- E. Field Test Reports: Submit written test reports and include the following:
  - 1. Test procedures used.
  - 2. Test results that comply with requirements.
  - 3. Results of failed tests and corrective action taken to achieve test results that comply with requirements.
- F. Panelboard Schedules: For installation in panelboards. Submit final versions after load balancing.
- G. Maintenance Data: For panelboards and components to include in maintenance manuals specified in Division 1. In addition to requirements specified in Division 1 Section "Contract Closeout," include the following:
  - 1. Manufacturer's written instructions for testing and adjusting overcurrent protective devices.
  - 2. Time-current curves, including selectable ranges for each type of overcurrent protective device.

#### 1.05 QUALITY ASSURANCE

- A. Testing Agency Qualifications: Testing agency that is a member company of the InterNational Electrical Testing Association and that is acceptable to authorities having jurisdiction.
- B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- C. Comply with NEMA PB 1.
- D. Comply with NFPA 70.

#### 1.06 COORDINATION

A. Coordinate layout and installation of panelboards and components with other construction that penetrates walls or is supported by them, including electrical and other types of equipment, raceways, piping, and encumbrances to workspace clearance requirements.

#### 1.07 EXTRA MATERIALS

A. Keys: Four spares of each type of panelboard cabinet lock.

#### PART 2 - PRODUCTS

#### 2.01 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
  - 1. Panelboards, Overcurrent Protective Devices, Controllers, Contactors, and Accessories:
    - a. Eaton Corp.; Cutler-Hammer Products.
    - b. General Electric Co.; Electrical Distribution & Control Div.
    - c. Siemens Energy & Automation, Inc.
    - d. Square D Co.
  - 2. TVSS Panelboards:
    - a. Current Technology, Inc.
    - b. Liebert Corporation.

#### 2.02 FABRICATION AND FEATURES

- A. Enclosures: Surface mounted cabinets. NEMA PB 1, Type 1, to meet environmental conditions at installed location.
  1. Other Wet or Damp Indoor Locations: NEMA 250, Type 4.
- B. Front: Secured to box with concealed trim clamps. For surface-mounted fronts, match box dimensions; for flush-mounted fronts, overlap box.
- C. Hinged Front Cover: Entire front trim hinged to box and with standard door within hinged trim cover.
- D. Finish: Manufacturer's standard enamel finish over corrosion-resistant treatment or primer coat.
- E. Directory Card: With transparent protective cover, mounted inside metal frame, inside panelboard door.
- F. Bus: Hard-drawn copper, 98 percent conductivity.
- G. Main and Neutral Lugs: Compression type suitable for use with conductor material.
- H. Equipment Ground Bus: Adequate for feeder and branch-circuit equipment ground conductors; bonded to box.
- I. Service Equipment Label: UL labeled for use as service equipment for panelboards with main service disconnect switches.
- J. Future Devices: Mounting brackets, bus connections, and necessary appurtenances required for future installation of devices.
- K. Skirt for Surface-Mounted Panelboards: Same gage and finish as panelboard front with flanges for attachment to panelboard, wall, and ceiling or floor.
- L. Gutter Barrier: Arrange to isolate individual panel sections.

#### 2.03 PANELBOARD SHORT-CIRCUIT RATING

- A. UL label indicating series-connected rating with integral or remote upstream devices. Include size and type of upstream device allowable, branch devices allowable, and UL series-connected short-circuit rating.
- B. Fully rated to interrupt symmetrical short-circuit current available at terminals.

#### 2.04 LIGHTING AND APPLIANCE BRANCH-CIRCUIT PANELBOARDS

- A. Branch Overcurrent Protective Devices: Bolt-on circuit breakers, replaceable without disturbing adjacent units.
- B. Doors: Front mounted with concealed hinges; secured with flush latch with tumbler lock; keyed alike.

#### 2.05 OVERCURRENT PROTECTIVE DEVICES

- C. Molded-Case Circuit-Breaker Features and Accessories. Standard frame sizes, trip ratings, and number of poles.
  - 1. Lugs: Mechanical or Compression style, suitable for number, size, trip ratings, and material of conductors.
  - 2. Application Listing: Appropriate for application; Type SWD for switching fluorescent lighting loads; Type HACR for heating, air-conditioning, and refrigerating equipment.
  - 3. Ground-Fault Protection: Integrally mounted relay and trip unit with adjustable pickup and time-delay settings, push-to-test feature, and ground-fault indicator.

#### 2.06 ACCESSORY COMPONENTS ACCESSORY COMPONENTS AND FEATURES

A. Fungus Proofing: Permanent fungicidal treatment for panelboard interior, including overcurrent protective devices and other components.

#### PART 3 - EXECUTION

#### 3.01 INSTALLATION

- A. Install panelboards and accessories according to NEMA PB 1.1.
- B. Comply with mounting and anchoring requirements specified in Division 16.
- C. Mounting Heights: Top of trim 74 inches above finished floor, unless otherwise indicated.
- D. Mounting: Plumb and rigid without distortion of box. Mount recessed panelboards with fronts uniformly flush with wall finish.
- E. Circuit Directory: Create a directory to indicate installed circuit loads after balancing panelboard loads. Obtain approval before installing. Use a computer or typewriter to create directory; handwritten directories are not acceptable.
- F. Install filler plates in unused spaces.

G. Wiring in Panelboard Gutters: Arrange conductors into groups and bundle and wrap with wire ties after completing load balancing.

#### 3.02 IDENTIFICATION

- A. Identify field-installed conductors, interconnecting wiring, and components; provide warning signs as specified in Division 16 Section Basic Electrical Materials and Methods.
- B. Panelboard Nameplates: Label each panelboard with engraved metal or laminatedplastic nameplate mounted with corrosion-resistant screws.

#### 3.03 CONNECTIONS

- A. Install equipment grounding connections for panelboards with ground continuity to main electrical ground bus.
- B. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

#### 3.04 FIELD QUALITY CONTROL

- A. Prepare for acceptance tests as follows:
  - 1. Test insulation resistance for each panelboard bus, component, connecting supply, feeder, and control circuit.
  - 2. Test continuity of each circuit.
- B. Testing: After installing panelboards and after electrical circuitry has been energized, demonstrate product capability and compliance with requirements.
  - 1. Procedures: Perform each visual and mechanical inspection and electrical test indicated in NETA ATS, Section 7.5 for switches and Section 7.6 for molded-case circuit breakers. Certify compliance with test parameters.
  - 2. Correct malfunctioning units on-site, where possible, and retest to demonstrate compliance; otherwise, replace with new units and retest.
- C. Balancing Loads: After Substantial Completion, but not more than 60 days after Final Acceptance, measure load balancing and make circuit changes as follows:
  - 1. Measure as directed during period of normal system loading.
  - 2. Perform load-balancing circuit changes outside normal occupancy/working schedule of the facility and at time directed. Avoid disrupting critical 24-hour services such as fax machines and on-line data-processing, computing, transmitting, and receiving equipment.

- 3. After circuit changes, recheck loads during normal load period. Record all load readings before and after changes and submit test records.
- 4. Tolerance: Difference exceeding 20 percent between phase loads, within a panelboard, is not acceptable. Rebalance and recheck as necessary to meet this minimum requirement.

#### 3.05 ADJUSTING

A. Set field-adjustable switches and circuit-breaker trip ranges.

#### 3.06 CLEANING

A. On completion of installation, inspect interior and exterior of panelboards. Remove paint splatters and other spots. Vacuum dirt and debris; do not use compressed air to assist in cleaning. Repair exposed surfaces to match original finish.

#### END OF SECTION

#### SECTION 16526A EXTERIOR ATHLETIC LIGHTING (EAST PARK) Lighting System with LED Light Source

#### PART 1 – GENERAL

#### 1.01 SUMMARY

- A. Work covered by this section of the specifications shall conform to the contract documents, engineering plans as well as state and local codes.
- B. The purpose of specifications is to define the lighting system performance and design standards for East Park using an LED Lighting source. The manufacturer / contractor shall supply lighting equipment to meet or exceed the standards set forth in these specifications.

#### C. The sports lighting will be for the following venues:

- 1. Basketball Courts
- 2. Tennis Courts / Pickle ball
- D. The primary goals of this sports lighting project are:
  - 1. Guaranteed Light Levels: Selection of appropriate light levels impact the safety of the players and the enjoyment of spectators. Therefore light levels are guaranteed to not drop below specified target values for a period of 25 years.
  - 2. Environmental Light Control: It is the primary goal of this project to minimize spill light to adjoining properties and glare to the players, spectators and neighbors. The LED design should provide better control than a good HID design.
  - 3. Life-cycle Cost: In order to reduce the operating budget, the preferred lighting system shall be energy efficient and cost effective to operate. All maintenance costs shall be eliminated for the duration of the warranty.
  - 4. Control and Monitoring: To allow for optimized use of labor resources and avoid unneeded operation of the facility, customer requires a remote on/off control system for the lighting system. Fields should be proactively monitored to detect luminaire outages over a 25-year life cycle. All communication and monitoring costs for 25-year period shall be included in the bid.

#### 1.02 LIGHTING PERFORMANCE

A. Illumination Levels and Design Factors: Playing surfaces shall be lit to an average target illumination level and uniformity as specified in the chart below. Lighting calculations shall be developed and field measurements taken on the grid spacing with the minimum number of grid points specified below. Appropriate light loss factors shall be applied and submitted for the basis of design. Average illumination level shall be measured in accordance with the IESNA LM-5-04 (IESNA Guide for Photometric Measurements of Area and Sports Lighting Installations). Illumination levels shall not to drop below desired target values in accordance to IES RP-6-15, Page 2, Maintained Average Illuminance and shall be guaranteed for the full warranty period.

Area of Lighting	Average Target Illumination Levels	Maximum to Minimum Uniformity Ratio	Grid Points	Grid Spacing
Basketball Courts	30 FC	3:1	40	10 X 10
Tennis Court	50 FC	2:1	30	20 X 20
Pickle ball	50 FC	2:1	90	10 X 10

B. Hours of usage: Designs shall be based on the following hours of usage

Area of Lighting	Annual Usage Hours	25 year Usage Hours
Basketball Court	500	12,500
Tennis Court / Pickle ball	500	12,500

- C. Color: The lighting system shall have a minimum color temperature of 5700K and a CRI of 75+..
- D. Mounting Heights: To ensure proper aiming angles for reduced glare and to provide better playability, minimum mounting heights shall be as described below. Higher mounting heights may be required based on photometric report and ability to ensure the top of the field angle is a minimum of 10 degrees below horizontal.

# of Poles	Pole Designation	Pole Height
1	BA1	40'
4	T1 - T4	40'

#### 1.03 ENVIRONMENTAL LIGHT CONTROL

A. Light Control Luminaires: All luminaires shall utilize spill light and glare control devices including, but not limited to, internal shields, louvers and external shields. No symmetrical beam patterns are accepted.

#### 1.04 <u>LIFE-CYCLE COSTS</u>

- A. Manufacturer shall submit a 25-year life cycle cost calculation as outlined in the required submittal information.
- B. Preventative and Spot Maintenance: Manufacturer shall provide all preventative and spot maintenance, including parts and labor for 25 years from the date of equipment shipment. Individual outages shall be repaired when the usage of any field is materially impacted. Owner agrees to check fuses in the event of a luminaire outage.

#### PART 2 – PRODUCT

#### 2.01 SPORTS LIGHTING SYSTEM CONSTRUCTION

- A. Manufacturing Requirements: All components shall be designed and manufactured as a system. All luminaires, wire harnesses, drivers and other enclosures shall be factory assembled, aimed, wired and tested.
- B. Durability: All exposed components shall be constructed of corrosion resistant material and/or coated to help prevent corrosion. All exposed carbon steel shall be hot dip galvanized per ASTM A123. All exposed aluminum shall be powder coated with high performance

polyester or anodized. All exterior reflective inserts shall be anodized, coated, and protected from direct environmental exposure to prevent reflective degradation or corrosion. All exposed hardware and fasteners shall be stainless steel of 18-8 grade or better, passivated and coated with aluminum-based thermosetting epoxy resin for protection against corrosion and stress corrosion cracking. Structural fasteners may be carbon steel and galvanized meeting ASTM A153 and ISO/EN 1461 (for hot dipped galvanizing), or ASTM B695 (for mechanical galvanizing). All wiring shall be enclosed within the cross-arms, pole, or electrical components enclosure.

- C. System Description: Lighting system shall consist of the following:
  - 1. Galvanized steel poles and cross-arm assembly.
  - 2. Non-approved pole technology:
    - a. Square static cast concrete poles will not be accepted.
    - b. Direct bury steel poles which utilize the extended portion of the steel shaft for their foundation will not be accepted due to potential for internal and external corrosive reaction to the soils and long term performance concerns.
  - 3. Lighting systems shall use concrete foundations. See Section 2.3 for details.
    - a. For a foundation using a pre-stressed concrete base embedded in concrete backfill the concrete shall be air-entrained and have a minimum compressive design strength at 28 days of 3,000 PSI. 3,000 PSI concrete specified for early pole erection, actual required minimum allowable concrete strength is 1,000 PSI. All piers and concrete backfill must bear on and against firm undisturbed soil.
    - b. For anchor bolt foundations or foundations using a pre-stressed concrete base in a suspended pier or reinforced pier design pole erection may occur after 7 days. Or after a concrete sample from the same batch achieves a certain strength.
  - 4. Manufacturer will supply all drivers and supporting electrical equipment
    - a. Remote drivers and supporting electrical equipment shall be mounted approximately 10 feet above grade in aluminum enclosures. The enclosures shall be touch-safe and include drivers and fusing with indicator lights on fuses to notify when a fuse is to be replaced for each luminaire. Disconnect per circuit for each pole structure will be located in the enclosure.
  - 5. Manufacturer shall provide surge protection at the pole equal to or greater than 40 kA for each line to ground (Common Mode) as recommended by IEEE C62.41.2\_2002.
  - 6. Wire harness complete with an abrasion protection sleeve, strain relief and plug-in connections for fast, trouble-free installation.
  - 7. All luminaires, visors, and cross-arm assemblies shall withstand 150 mph winds and maintain luminaire aiming alignment.
  - 8. Control cabinet to provide remote on-off control and monitoring of the lighting system. See Section 2.4 for further details.
  - 9. Manufacturer shall provide lightning grounding as defined by NFPA 780 and be UL Listed per UL 96 and UL 96A.
    - a. Integrated grounding via concrete encased electrode grounding system.
    - b. If grounding is not integrated into the structure, the manufacturer shall supply grounding electrodes, copper down conductors, and exothermic weld kits.

Electrodes and conductors shall be sized as required by NFPA 780. The grounding electrode shall be minimum size of 5/8 inch diameter and 8 feet long, with a minimum of 10 feet embedment. Grounding electrode shall be connected to the structure by a grounding electrode conductor with a minimum size of 2 AWG for poles with 75 feet mounting height or less, and 2/0 AWG for poles with more than 75 feet mounting height.

D. Safety: All system components shall be UL listed for the appropriate application.

#### 2.02 <u>ELECTRICAL</u>

- A. Electric Power Requirements for the Sports Lighting Equipment:
  - 1. Electric power: 480 Volt, Three Phase
  - 2. Maximum total voltage drop: Voltage drop to the disconnect switch located on the poles shall not exceed three (3) percent of the rated voltage.
- B. Energy Consumption: The kW consumption for the field lighting system shall be 12 kW.

#### 2.03 STRUCTURAL PARAMETERS

- 2.04 Wind Loads: Wind loads shall be based on the 2009 International Building Code. Wind loads to be calculated using ASCE 7-05, a design wind speed of 105 mph, exposure category C and wind importance factor of 1.
- 2.05 Pole Structural Design: The stress analysis and safety factor of the poles shall conform to 2009 AASHTO Standard Specification for Structural Supports for Highway Signs, Luminaires, and Traffic Signals (LTS-5).
- 2.06 Foundation Design: The foundation design shall be based on soil parameters as outlined in the geotechnical report. If a GEO Tech report is not available, the foundation design shall be based on soils that meet or exceed those of a Class 5 material as defined by 2009 IBC Table 1806.2.

#### 2.07 CONTROL

- A. Instant On/Off Capabilities: System shall provide for instant on/off of luminaires.
- B. Lighting contactor cabinet(s) constructed of NEMA Type 4 aluminum, designed for easy installation with contactors, labeled to match field diagrams and electrical design. Manual off-on-auto selector switches shall be provided.
- C. Remote Lighting Control System: System shall allow owner and users with a security code to schedule on/off system operation via a web site, phone, fax or email up to ten years in advance. Manufacturer shall provide and maintain a two-way TCP/IP communication link. Trained staff shall be available 24/7 to provide scheduling support and assist with reporting needs.

The owner may assign various security levels to schedulers by function and/or fields. This function must be flexible to allow a range of privileges such as full scheduling capabilities for all fields to only having permission to execute "early off" commands by phone. Scheduling tool shall be capable of setting curfew limits.

Controller shall accept and store 7-day schedules, be protected against memory loss during power outages, and shall reboot once power is regained and execute any commands that would have occurred during outage.

- D. Remote Monitoring System: System shall monitor lighting performance and notify manufacturer if individual luminaire outage is detected so that appropriate maintenance can be scheduled. The controller shall determine switch position (manual or auto) and contactor status (open or closed).
- E. Management Tools: Manufacturer shall provide a web-based database and dashboard tool of actual field usage and provide reports by facility and user group. Dashboard shall also show current status of luminaire outages, control operation and service. Mobile application will be provided suitable for IOS, Android and Blackberry devices.

Hours of Usage: Manufacturer shall provide a means of tracking actual hours of usage for the field lighting system that is readily accessible to the owner.

- 1. Cumulative hours: shall be tracked to show the total hours used by the facility
- 2. Report hours saved by using early off and push buttons by users.
- F. Communication Costs: Manufacturer shall include communication costs for operating the controls and monitoring system for a period of 25 years.

#### PART 3 – EXECUTION

#### 3.01 SOIL QUALITY CONTROL

- A. It shall be the Contractor's responsibility to notify the Owner if soil conditions exist other than those on which the foundation design is based, or if the soil cannot be readily excavated. Contractor may issue a change order request / estimate for the Owner's approval / payment for additional costs associated with:
  - 1. Providing engineered foundation embedment design by a registered engineer in the State of Massachusetts for soils other than specified soil conditions;
  - 2. Additional materials required to achieve alternate foundation;
  - 3. Excavation and removal of materials other than normal soils, such as rock, caliche, etc.

#### 3.02 <u>DELIVERY TIMING</u>

A. Delivery Timing Equipment On-Site: The equipment must be on-site 6-8 from receipt of approved submittals and receipt of complete order information.

#### 3.03 FIELD QUALITY CONTROL

- A. Illumination Measurements: Upon substantial completion of the project and in the presence of the Contractor, Project Engineer, Owner's Representative, and Manufacturer's Representative, illumination measurements shall be taken and verified. The illumination measurements shall be conducted in accordance with IESNA LM-5-04.
- B. Field Light Level Accountability
  - 1. Light levels are guaranteed not to fall below the target maintained light levels for the entire warranty period of 25 Years.
  - 2. The contractor/manufacturer shall be responsible for an additional inspection one year from the date of commissioning of the lighting system and will utilize the owner's light meter in the presence of the owner.
  - The contractor/manufacturer will be held responsible for any and all changes needed to bring these fields back to compliance for light levels and uniformities. Contractor/Manufacturer will be held responsible for any damage to the fields during these repairs.

C. Correcting Non-Conformance: If, in the opinion of the Owner or his appointed Representative, the actual performance levels including footcandles and uniformity ratios are not in conformance with the requirements of the performance specifications and submitted information, the Manufacturer shall be required to make adjustments to meet specifications and satisfy Owner.

#### 3.04 WARRANTY AND GUARANTEE

- A. 25-Year Warranty: Each manufacturer shall supply a signed warranty covering the entire system for 25 years from the date of shipment. Warranty shall guarantee specified light levels. Manufacturer shall maintain specifically-funded financial reserves to assure fulfillment of the warranty for the full term. Warranty does not cover weather conditions events such as lightning or hail damage, improper installation, vandalism or abuse, unauthorized repairs or alterations, or product made by other manufacturers.
- B. Maintenance: Manufacturer shall monitor the performance of the lighting system, including on/off status, hours of usage and luminaire outage for 25 years from the date of equipment shipment. Parts and labor shall be covered such that individual luminaire outages will be repaired when the usage of any field is materially impacted. Owner agrees to check fuses in the event of a luminaire outage.

#### PART 4 – DESIGN APPROVAL

#### 4.0 PRE-BID SUBMITTAL REQUIREMENTS (Non-Musco)

- A. Design Approval: The owner / engineer will review pre-bid submittals per section 4.0.B from all the manufacturers to ensure compliance to the specification 10 days prior to bid. If the design meets the design requirements of the specifications, a letter and/or addendum will be issued to the manufacturer indicating approval for the specific design submitted.
- B. Approved Product: Musco's Light-Structure System<sup>TM</sup> with TLC for LED<sup>TM</sup> is the approved product. All substitutions must provide a complete submittal package for approval as outlined in Submittal Information at the end of this section at least 10 days prior to bid. Special manufacturing to meet the standards of this specification may be required. An addendum will be issued prior to bid listing any other approved lighting manufacturers and designs.
- C. All listed manufacturers not pre-approved shall submit the information at the end of this section at least 10 days prior to bid. An addendum will be issued prior to bid; listing approved lighting manufacturers and the design method to be used.
- D. Bidders are required to bid only products that have been approved by this specification or addendum by the owner or owner's representative. Bids received that do not utilize an approved system/design, will be rejected.

#### REQUIRED SUBMITTAL INFORMATION FOR ALL MANUFACTURERS (NOT PRE-APPROVED) 10 DAYS PRIOR TO BID

All items listed below are mandatory, shall comply with the specification and be submitted according to pre-bid submittal requirements. Complete the Yes/No column to indicate compliance (Y) or noncompliance (N) for each item. Submit checklist below with submittal.

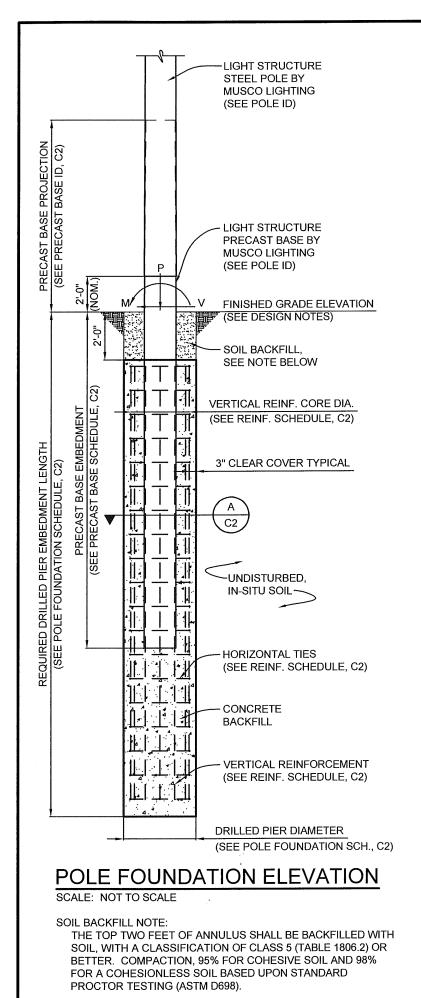
Yes / No	Tab	Item	Description
	А	Letter/ Checklist	Listing of all information being submitted must be included on the table of contents. List the name of the manufacturer's local representative and his/her phone number. Signed submittal checklist to be included.
	В	Equipment Layout	Drawing(s) showing field layouts with pole locations
	С	On Field Lighting Design	<ul> <li>Lighting design drawing(s) showing:</li> <li>a. Field Name, date, file number, prepared by</li> <li>b. Outline of field(s) being lighted, as well as pole locations referenced to the center of the field (x &amp; y), Illuminance levels at grid spacing specified</li> <li>c. Pole height, number of fixtures per pole, horizontal and vertical aiming angles, as well as luminaire information including wattage, lumens and optics</li> <li>d. Height of light test meter above field surface.</li> <li>e. Summary table showing the number and spacing of grid points; average, minimum and maximum illuminance levels in foot candles (fc); uniformity including maximum to minimum ratio, coefficient of variance (CV), coefficient of utilization (CU) uniformity gradient; number of luminaries, total kilowatts, average tilt factor; light loss factor.</li> </ul>
	D	Photometric Report	Provide first page of photometric report for all luminaire types being proposed showing candela tabulations as defined by IESNA Publication LM-35-02. Photometric data shall be certified by laboratory with current National Voluntary Laboratory Accreditation Program or an independent testing facility with over 5 years experience.
	E	Performance Guarantee	Provide performance guarantee including a written commitment to undertake all corrections required to meet the performance requirements noted in these specifications at no expense to the owner. Light levels must be guaranteed to not fall below target levels for warranty period.
	F	Structural Calculations	Pole structural calculations and foundation design showing foundation shape, depth backfill requirements, rebar and anchor bolts (if required). Pole base reaction forces shall be shown on the foundation drawing along with soil bearing pressures. Design must be stamped by a structural engineer in the state of Massachusetts, if required by owner.
	G	Control & Monitoring System	Manufacturer of the control and monitoring system shall provide written definition and schematics for automated control system to include monitoring. They will also provide ten (10) references of customers currently using proposed system in the state of Massachusetts.
	Н	Electrical Distribution Plans	Manufacturer bidding an alternate product must include a revised electrical distribution plan including changes to service entrance, panels and wire sizing, signed by a licensed Electrical Engineer in the state of Massachusetts.
	Ι	Warranty	Provide written warranty information including all terms and conditions. Provide ten (10) references of customers currently under specified warranty in the state of

		Massachusetts.
J	Project References	Manufacturer to provide a list of 10 projects where the technology and specific fixture proposed for this project has been installed in the state of Massachusetts. Reference list will include project name, project city, installation date, and if requested, contact name and contact phone number.
K	Product Information	Complete bill of material and current brochures/cut sheets for all product being provided.
L	Delivery	Manufacturer shall supply an expected delivery timeframe from receipt of approved submittals and complete order information.
М	Non- Compliance	Manufacturer shall list all items that do not comply with the specifications. If in full compliance, tab may be omitted.
N	Life-cycle Cost Calculation	Document life-cycle cost calculations as defined in the specification. Identify energy costs for operating the luminaires. Maintenance cost for the system must be included in the warranty. All costs should be based on 25 Years. (complete table below)

	25-Year Life Cycle Operating Cost		
a.	Luminaire energy consumption luminaires x kW demand per luminaire x .19 kWh rate x 500 annual usage hours x 25 years		
b.	Demand charges, if applicable	+	
c.	Cost for maintenance, not covered, for 25 years Assume 7.5 repairs at \$500.00 each if not included with the bid.	+	
	TOTAL 25 -Year Life-cycle Operating Cost	=	

The information supplied herein shall be used for the purpose of complying with the specifications for East Park. By signing below I agree that all requirements of the specifications have been met and that the manufacturer will be responsible for any future costs incurred to bring their equipment into compliance for all items not meeting specifications and not listed in the Non-Compliance section.

Manufacturer:	Signature:
Contact Name:	Date://
Contractor:	_ Signature:



#### POLE IDENTIFICATION

POLE DESIGNATION			FIXTURE CONFIGURATION (FIX. PER XARM)	FIXTURE AND ACCESSORIES EPA (FT <sup>2</sup> )
BA1	LSS40A	1B	2 (2)	3.3
T1, T4	LSS40A	1B	5 (3) / (2)	7.4
Т2, Т3	LSS40A	1B	3 (3)	4.4

#### **DESIGN NOTES**

DESIGN PARAMETERS: WIND: V<sub>ult</sub> = 127 MPH, V<sub>asd</sub> = 98 MPH (EXPOSURE C, RISK CATEGORY II) PER MASSACHUSETTS STATE BUILDING CODE - 780 CMR, 9TH EDITION (IBC 2015 / ASCE 7-10). GEOTECHNICAL PARAMETERS:

REQUIRED ALLOWABLE END BEARING SOIL PRESSURE: 1,000 PSF ALLOWABLE LATERAL SOIL BEARING PRESSURE: 0 PSF/FT (GRADE TO -2'-0"); 50 PSF/FT (-2'-0" TO -4'-0"); 100 PSF/FT (-4'-0" TO -10'-0"); 200 PSF/FT (BELOW -10'-0") IN ACCORDANCE WITH MASSACHUSETTS STATE BUILDING CODE - 780 CMR, 9TH EDITION,

IN ACCORDANCE WITH MASSACHUSE CHAPTER 18.

DESIGN SOIL PARAMETERS ARE AS NOTED. ACTUAL ALLOWABLE SOIL PARAMETERS MUST BE VERIFIED ON SITE.

A GEOTECHNICAL ENGINEER OR REPRESENTATIVE OF IS RECOMMENDED (NOT REQUIRED) TO BE AVAILABLE AT THE TIME OF THE FOUNDATION INSTALLATION TO VERIFY THE SOIL DESIGN PARAMETERS AND TO PROVIDE ASSISTANCE IF ANY PROBLEMS ARISE IN FOUNDATION INSTALLATION.

ENCOUNTERING SOIL FORMATIONS THAT WILL REQUIRE SPECIAL DESIGN CONSIDERATIONS OR EXCAVATION PROCEDURES MAY OCCUR. POLE FOUNDATIONS WILL NEED TO BE ANALYZED ACCORDING TO THE SOIL CONDITIONS THAT EXIST. IF ANY DISCREPANCIES OR INCONSISTENCIES ARISE, NOTIFY THE ENGINEER OF SUCH DISCREPANCIES. FOUNDATIONS WILL THEN BE REVISED ACCORDINGLY. REVISIONS WILL BE ANALYZED PER RECOMMENDATIONS DIRECTED BY A LICENSED ENGINEER.

ALL EXCAVATIONS MUST BE FREE OF LOOSE SOIL AND DEBRIS PRIOR TO FOUNDATION INSTALLATION AND CONCRETE BACKFILL PLACEMENT. TEMPORARY CASINGS OR DRILLERS SLURRY MAY BE USED TO STABILIZE THE EXCAVATION DURING INSTALLATION. CASINGS MUST BE REMOVED DURING CONCRETE BACKFILL PLACEMENT. CONCRETE BACKFILL MUST BE PLACED WITH A TREMIE WHEN SLURRY OR WATER IS PRESENT WITHIN THE EXCAVATION OR WHEN THE FREE DROP EXCEEDS 6'-0".

CONTRACTOR MUST BE FAMILIAR WITH THE COMPLETE SOIL INVESTIGATION REPORT AND BORINGS, AND CONTACT THE GEOTECHNICAL FIRM (IF NECESSARY) TO UNDERSTAND THE SOIL CONDITIONS AND THE POSSIBILITY OF GROUND WATER PUMPING AND EXCAVATION STABILIZATION OR BRACING DURING PRECAST BASE INSTALLATION AND PLACEMENT OF CONCRETE BACKFILL.

GENERAL NOTES:

FIXTURES MUST BE LOCATED TO MAINTAIN 10'-0" MINIMUM HORIZONTAL CLEARANCE FROM ANY OBSTRUCTION. ENGINEER MUST BE NOTIFIED IF FOUNDATIONS ARE NEAR ANY RETAINING WALLS OR WITHIN / NEAR ANY SLOPES STEEPER THAN 3H : 1V. POLES, FIXTURES, PRECAST BASES, ELECTRICAL ITEMS AND INSTALLATION PER MUSCO LIGHTING.

#### CONCRETE/REINFORCEMENT NOTES

CONCRETE SHALL COMPLY WITH THE FOLLOWING ASTM STANDARDS: MIXTURE WITH ASTM C-94, PORTLAND CEMENT WITH ASTM C-150 TYPE 1-A, AGGREGATES (0.75" MAX) WITH ASTM C-33 AND BE IN CONFORMANCE WITH ACI 318.

CONCRETE SHALL BE AIR-ENTRAINED (COMPLY WITH ASTM C-260), HAVE A MAXIMUM WATER -CEMENT RATIO, w/cm = 0.45 AND HAVE A MINIMUM COMPRESSIVE STRENGTH AT 28 DAYS OF 4,000 PSI.

DESIGN SLUMP LIMITS ARE 4" MINIMUM AND 6" MAXIMUM. THE JOB SITE SLUMP MAY BE INCREASED BY THE USE OF A WATER REDUCING AGENT MEETING ASTM C494-92.

CONCRETE REINFORCEMENT SHALL COMPLY WITH ASTM A615 GRADE 60, EXCEPT TIES CAN BE OF GRADE 40 AND BE IN CONFORMANCE WITH ACI 315 & 318.

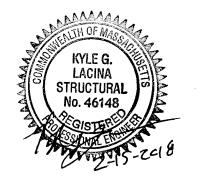
CONCRETE DRILLED PIERS MUST ATTAIN 3,000 PSI STRENGTH PRIOR TO POLE INSTALLATION AND FIXTURE MOUNTING.

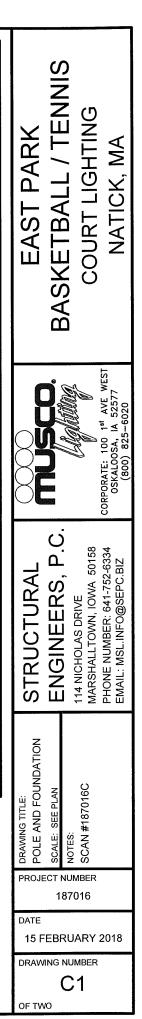
THE DEPTH EQUAL TO THE PRECAST BASE EMBEDMENT SHALL BE THOROUGHLY CONSOLIDATED BY MECHANICAL VIBRATION DURING PLACEMENT.

#### INSTALLATION NOTE:

CONCRETE TO BE PLACED IN A CONTINUOUS POUR OR A COLD JOINT WILL BE ACCEPTABLE AT THE BOTTOM OF THE PRECAST BASE. TWO POUR: WITH THE REINFORCEMENT IN PLACE, THE CONCRETE BELOW THE BOTTOM OF THE PRECAST BASE MAY BE POURED AND ALLOWED TO SET UP LONG ENOUGH TO SUPPORT WEIGHT OF PRECAST BASE. THEN THE PRECAST BASE MAY BE SET IN PLACE AND THE REST OF THE CONCRETE CONCRETE BACKFILL POURED. DEPENDING ON THE DEPTH TO GROUND WATER AT THE TIME OF INSTALLATION, THE TWO POUR METHOD UTILIZING A COLD JOINT MAY NOT BE FEASIBLE.

USE OR REPRODUCTION OF THIS INFORMATION OTHER THAN ITS INTENDED PURPOSE FOR THIS PROJECT IS PROHIBITED WITHOUT WRITTEN CONSENT FROM MUSCO SPORTS LIGHTING, LLC.





POLE FOUNDATION SCHEDULE									
	ſ	FORCES (1.)	)	DRILLED PIER			REINFORCING		
POLE DESIGNATION	MOMENT (M) FT-LBS	SHEAR (V) LBS	VERTICAL (P) LBS	DIAMETER INCHES	EMBEDMENT DEPTH	CONCRETE BACKFILL YD <sup>3</sup> (2.)	CORE DIAMETER INCH (3.)	VERTICAL REINFORCING	HORIZONTAL TIES
BA1	12,568	530	469	30	12'-0"	1.8	23	10 - #6	#4 @ 12"
T1, T4	19,263	707	634	30	12'-0"	1.8	23	10 - #6	#4 @ 12"
T2, T3	14,449	582	525	30	12'-0"	1.8	23	10 - #6	#4 @ 12"

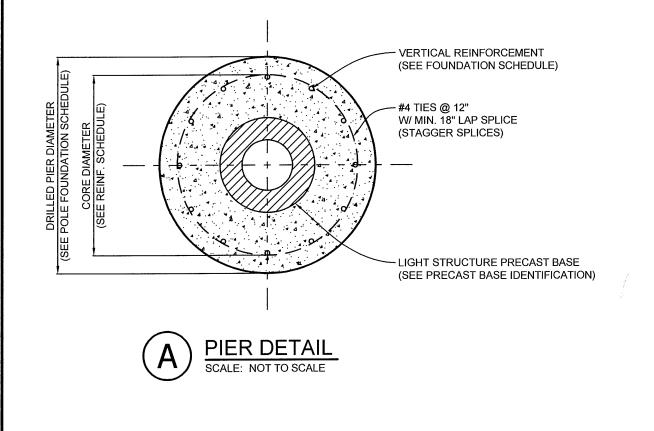
1. ASD LOAD COMBINATION D + 0.6W.

VERTICAL FORCE IS WEIGHT OF DRESSED POLE (DOES NOT INCLUDE PRECAST BASE WEIGHT).

2. MINIMUM CONCRETE BACKFILL VOLUME, SITE CONDITIONS MAY REQUIRE ADDITIONAL BACKFILL.

3. CORE DIAMETER EQUAL TO INSIDE DIAMETER OF TIES.

PRECAST BASE IDENTIFICATION								
PRECAST BASE TYPE								
1B 920 LBS 15'-2" 7'-2" 8'-0" 9.56"								
REFERE	REFERENCE POLE ID TABLE ON SHEET C1 FOR POLE TO PRECAST BASE TYPES							



EAST PARK	<b>BASKETBALL / TENNIS</b>	COURT LIGHTING	NATICK, MA				
	Relition.	17111111111111111111111111111111111111	CORPORATE: 100 1 <sup>st</sup> AVE WEST OSKALOOSA, 1A 52577 (800) 825-6020				
STRUCTURAL	ENGINEERS, P.C.	114 NICHOLAS DRIVE MARSHALLTOWN, IOWA 50158	PHONE NUMBER: 641-752-6334 EMAIL: MSL.INFO@SEPC.BIZ				
DRAWING TITLE: POLE AND FOUNDATION	0	NUTES: SCAN #187016C					
PROJE		JMBER 7016					
DATE 15 FI	DATE 15 FEBRUARY 2018						
DRAWI		UMBER					
OF TW	0						



Appendix A - Sand and Soil Amendments

Job N Comp	lame: Weston and pany: Tom Irwin Inc	-	Soil Report Date: 6/6/2017 Submitted By: Brian Luccini				
Sample	e Location		EP-1-NW	EP-2-SW	EP-3-SE	EP-4-NE	EP-5-HT
Sample ID							
Lab Nu	umber		41	42	43	44	45
Sample	e Depth in inches		6	6	6	6	6
Total E	Exchange Capacity (M. E.)		3.76	6.51	2.64	2.92	1.79
pH of S	Soil Sample		5.4	5.6	5.7	5.6	5.6
Organi	c Matter, Percent		5.23	4.66	4.49	5.34	2.31
SNO	SULFUR:	p.p.m.	27	19	19	17	17
ANIONS	Mehlich III Phosphorous:	as (P_O_) 2_5 lbs / acre	362	422	623	599	318
TIONS	CALCIUM: Ibs / acre	Desired Value Value Found Deficit	1022 658 -364	1769 1567 -202	719 576 -143	793 603 -190	487 340 -147
EXCHANGEABLE CATIONS	MAGNESIUM: Ibs / acre	Desired Value Value Found Deficit	200 87 -113	200 64 -136	200 57 -143	200 69 -131	200 48 -152
EXCHAN	POTASSIUM: Ibs / acre	Desired Value Value Found Deficit	200 80 -120	202 38 -164	200 48 -152	200 60 -140	200 46 -154
	SODIUM:	lbs / acre	74	51	51	36	40
몹	Calcium (60 to 70%)		43.74	60.22	54.46	51.69	47.45
lion	Magnesium (10 to 20%)		9.64	4.10	8.98	9.86	11.17
IRAI	Potassium (2 to 5%)		2.73	0.75	2.33	2.64	3.29
SATL	Sodium (.5 to 3%)		4.27	1.72	4.22	2.68	4.86
BASE SATURATION	Other Bases (Variable)		6.60	6.20	6.00	6.20	6.20
BP	Exchangable Hydrogen (10 to 15	5%)	33.00	27.00	24.00	27.00	27.00
S	Boron (p.p.m.)		0.34	0.31	0.28	0.26	0.33
IEN	Iron (p.p.m.)		151	133	147	139	134
ELEN	Manganese (p.p.m.)		16	10	6	9	6
Iron (p.p.m.)       Manganese (p.p.m.)       Copper (p.p.m.)       Zinc (p.p.m.)			2.79	2.68	2.81	2.58	7.31
-		3.23	2.63	3.8	3.47	8.62	
-	Aluminum (p.p.m.)		1531	1687	1650	1648	1595
OTHER							

#### Logan Labs, LLC

Job N Comp	lame: <b>Weston and</b> bany: Tom Irwin Ind	•	Soil Rep		Date: bmitted By:	6/6/2017 Brian Luc	ccini
Sample	e Location		NY-1-NW	NY-2-NE	NY-3-SE	NY-4-C	NY-5-SW
Sample	e ID						
Lab Nu	ımber		46	47	48	49	50
Sample	e Depth in inches		6	6	6	6	6
Total E	Exchange Capacity (M. E.)		6.25	4.00	4.74	5.20	4.88
pH of S	Soil Sample		5.7	5.5	5.8	5.8	5.8
Organi	c Matter, Percent		9.08	5.19	7.10	6.92	7.45
SN	SULFUR:	p.p.m.	17	21	19	17	14
ANIONS	Mehlich III Phosphorous:	as (P_O_) 2_5 lbs / acre	274	428	344	273	254
VIONS	CALCIUM: Ibs / acre	Desired Value Value Found Deficit	1701 1435 -266	1087 774 -313	1289 1096 -193	1414 1239 -175	1326 1111 -215
EXCHANGEABLE CATIONS	MAGNESIUM: lbs / acre	Desired Value Value Found Deficit	200 155 -45	200 104 -96	200 128 -72	200 118 -82	200 137 -63
EXCHAN	POTASSIUM: Ibs / acre	Desired Value Value Found Deficit	200 51 -149	200 53 -147	200 72 -128	200 93 -107	200 113 -87
	SODIUM:	lbs / acre	36	49	48	45	35
ч	Calcium (60 to 70%)		57.37	48.41	57.79	59.57	56.95
lion	Magnesium (10 to 20%)		10.33	10.84	11.25	9.46	11.70
JRA]	Potassium (2 to 5%)		1.05	1.70	1.95	2.29	2.97
SATI	Sodium (.5 to 3%)		1.25	2.66	2.19	1.88	1.57
BASE SATURATION	Other Bases (Variable)		6.00	6.40	5.80	5.80	5.80
8	Exchangable Hydrogen (10 to 1	5%)	24.00	30.00	21.00	21.00	21.00
IS	Boron (p.p.m.)		0.31	0.29	0.38	0.28	0.29
MEN	Iron (p.p.m.)		98	143	125	90	117
ELEI	Manganese (p.p.m.)		8.51	9 3.55	5 7.58	6 3.31	5.04
TRACE ELEMENTS	Copper (p.p.m.) Zinc (p.p.m.)		17.25	4.94	12.28	5.59	10.96
IR	Aluminum (p.p.m.)		1584	1538	1640	1530	1539
OTHER	(bibility)						
D							



#### EARTHWORKS NATURAL ORGANIC PRODUCTS, INC.

#### A 50:50 BLEND OF RENOVATE AND ECO-LITE

Renovate/Plus is an Ideal Amendment for:

GOLF COURSE GREENS AERIFICATION SODDING AND SEEDING PROJECTS SPORTS TURF RECOVERY LANDSCAPE PLANTINGS RECOVERY OF "DEAD SPOTS" NEW CONSTRUCTION BIOLOGICAL REPLENISHMENT DIVOT MIX

**Renovate**/*Plus* is the combination of EarthWorks **Renovate** and **Eco-Lite** and is a powerful amendment that will open tight soils, speed turf recovery, and stimulate soil biology without a big nitrogen push. This combination allows for oxygen movement through the soil and promotes an active microbial generated nitrogen cycle. This product is ideal for numerous projects on the golf course or sports field and can "save" those hard to grow areas. Renovate/Plus is the combination of all the raw materials found in The EarthWorks "Construction Program" which has been a huge success since the early 1990's, and has been the amendment program of choice for hundreds of golf courses as well as professional sports stadiums and other athletic fields. Renovate/Plus encourages quick recovery of "dead spots," is the ideal product to put under any sod job, and can replace multiple aerification products to simplify those projects and significantly increase their success rate. **Renovate** is a blend of organic and mineral amendments including kelp meal, compost and humic acids which make up a sustainable microbial food source of short, medium and long chained carbons. The diversity of ingredients allows for a quick jump-start of soil activity, but one that will also be sustainable. The mineral fraction of **Renovate** includes greensand, sul-po-mag, hard and soft rock phosphate, and calcium. This combination prevents de-mineralization of the soil and allows for roots to take up nutrients as needed, and is a great way to provide a biological foundation to any soil by promoting soil flocculation and turf recovery. **Eco-Lite** is the premier zeolite rock mineral mined from an exceptionally clean zeolite mine and provides an array of physical benefits including the highest CEC of all physical amendments. Zeolites are very hard rock minerals that possess a crystalline structure and have the capability to absorb water when the surrounding soil is wet, creating better air movement in the soil and allowing for the controlled release of this water when moisture levels in the soil fall. Perhaps the greatest difference between **Eco-Lite** and other physical amendments is its affinity to hold both ammonium nitrogen and potassium, allowing for both nutrients to be more available to the plant over a longer period of time.



1500 Uhler Rd. Easton, PA 18040 **800-732-8873** Fax: 610-250-7840 soilfirst.com



#### RENOVATE Plus ECO-LITE

Ecolite - zeolite Kelp Meal Greensand Compost Hard Rock Phosphate Soft Rock Phosphate Humic/Fulvic Acids Sul-Po-Mag

## Renovate/Plus Recovery Amendment

**Renovate**/*Plus* has a multitude of applications on golf courses, sports turf and landscaping situations. A combination of EarthWorks **Renovate** and the physical amendment **Eco-Lite**, this product can assure the success of sod jobs, improve aerification projects, help recover worn out dead spots and is an ideal divot mix and planting amendment. **Renovate**/*Plus* is formulated from the following amendments in order of volume:

**Eco-Lite**<sup>™</sup>: A Zeolite rock mineral mined from the cleanest known mine in New Mexico. Eco-Lite provides numerous benefits to the soil profile. First and perhaps most significantly, this mineral has the highest CEC value of any popular physical amendment ~ as much as three times higher than calcined clays and diatomaceous earth. Eco-Lite also has a very high water holding capacity which allows excess water to be pulled into its crystalline structure to dry up wet soils but allowing for its release osmotically as water pressure drops outside the mineral structure. This phenomena also explains how this mineral can create more air pore space. The most unique benefit from Eco-Lite is its strong affinity to hold ammonium and potassium while not having the same affinity for sodium. Eco-Lite becomes a sustainable mineral form of potassium preventing the leaching of more soluble forms.

**Dry Kelp Meal**: A very digestible food source for micro-organisms. Rich in over 60 minerals, 21 Amino Acids and 12 Vitamins, ascophyllum nodosum is also a rich source of plant gibberellins and cytokinins which act as plant growth regulators. Kelp extract also provides polysaccarides, which are complex sugars, which along with its vitamins, minerals and amino acids greatly assists in the feeding of soil beneficial micro flora.

**Greensand:** A potassium silica rock mineral rich in sustainable and available potassium, iron and many other trace nutrients. This is a mica like rock mineral that holds it own weight in water and is an excellent soil conditioner.

**Compost:** Rich compost, produced on Amish farms in Pennsylvania, provides a stable form of carbon and minerals. Produced from stabilized manures, this product has gone through two digestions, producing an extremely biologically active material and a readily available food source for beneficial micro-organisms.

**Hard Rock Phosphate:** This is the mineral that is acidified to create the commonly used soluble phosphorous fertilizers. There are studies that show this sustainable rock mineral to be as available as its soluble counterparts when chemical tie-up is taken into account. It is used as a very sustainable form of phosphorus; one that organic acids produced by plant root systems can digest when phosphorus is needed.

**Soft Rock Phosphate:** A colloidal form of phosphorus. This mineral is available over a wider range of soil pH and provides a certain solubility not found in its hard rock counterpart. **Humic acid and Fulvic acids:** An alkaline extract of geologically concentrated humus, rich in organic acids that stimulate beneficial soil fungi, act as chelating agents for micro-nutrients and perform as sequestering agents to help fracture bonds between phosphorus and iron/calcium/aluminum.

**Sul-Po-Mag**: A mineral that provides the soil with needed sulfur, potassium and magnesium as well as a host of other trace nutrients. Magnesium is a very important nutrient in the photosynthesis process. This mineral is a very good soil conditioner and is fairly soluble.

#### **APPLICATION RATES:**

Apply 25-50 lbs./1000 sq. ft. preferably in combination with aeration or worked into the top few inches of soil. Lighter top dressings can also be very beneficial. Continued use is important especially on heavily compacted and biologically weak soils or sand based soils.



## **Myco-Replenish** 3-3-3 Organic Fertilizer with Mycorrhizae

**Myco-Replenish** combines the high quality of EarthWorks Replenish natural organic fertilizers with root stimulating endo and ecto mycorrhizae fungi. **Myco-Replenish** is ideal for any landscape planting situation, establishment of grass seed or sod and will enhance all soil aerification practices. An extensive amount of Mycorrhizae fungi in combination with the known value of the Replenish compost fertilizer will help to promote extensive root growth, reduce heat and drought stress, improves water and nutrient uptake and can eliminate transplant shock.

The word "mycorrhizae" literally means "fungus-roots" and defines the close mutually beneficial relationship between specialized soil fungi (mycorrhizal fungi) and plant roots. About 95% of the world's land plants form the mycorrhizal relationship in their native habitats. It is estimated that mycorrhizal fungi filaments explore hundreds to thousands more soil volume compare to roots alone.

Mycorrhizal fungi increase the surface absorbing area of roots 10 to 1,000 times, thereby greatly improving the ability of the plant to use the soils resources. Several miles of fungal filaments can be present in the thimbleful of soil. But mycorrhizal fungi increase nutrient uptake not only by increasing the surface absorbing area of the roots, but also release powerful enzymes into the soil that dissolve hard-to-capture nutrients, such as phosphorous, magnesium and other "tightly bound" soil nutrients. This extraction process is particularly important in plant nutrient and explains why nonmycorrhizal plants require high levels of fertility to maintain their health.

When combined with the carbon rich food source of Replenish fertilizers the **Myco Replenish 3-3-3** has the energy to take off and perform.

## Dry Organics Myco-Replenish

#### Dry Organics:

- Replenish Compost
- Endo Mycorrhizae
- Ecto Mycorrhizae
- Humic Acids



soilfirst.com

## **Myco-Replenish** 3-3-3 Organic Fertilizer with Mycorrhizae

EarthWorks Dry Organics the key to success when building a healthy environment.

#### Myco-Replenish 3-3-3 Guaranteed Analysis

Total Nitrogen (N)	
Water Insoluble Nitrogen	2.1%
Water Soluble Nitrogen	0.9%
Available Phosphorous (P <sub>2</sub> O <sub>5</sub> )	
Soluble Potash (K <sub>2</sub> O)	
Calcium (Ca)	
Iron	0.2%

Plant Nutrients Derived From: Composted Poultry Manure

#### **Contains Endo Mycorrhizae**

*Endomycorrhizal fungi:* 750 propagules per pound: Glomus intraradices, Glomus etunicatum Glomus mosseae, Glomus aggregatum

#### **Contains Ecto Mycorrhizae**

*Ectomycorrhizal fungi:* 2,750,000 propagules per pound: Pisolithus tinctorius, Scleroderma cepa Scleroderma citrinnum, Rhizopogon villosullus Rhizopogon luteolus, Rhizopogon amylopogon Rhizopogon fulvigleba

#### **Application Rates & Programs**

#### TURF:

Aerification: Apply 10 -15 pounds per 1,000 sq. ft.

Sod: Apply 10 pounds per 1,000 sq. ft. as a soil prep.

**Seed:** Apply 15 pounds per 1,000 sq. ft. of seeded area worked well into the soil.

#### **PLANTINGS:**

Mix with the soil being used to fill the planting hole at the rates shown:

**Trees:** <sup>1</sup>/<sub>2</sub> pound (1 cup) for every 1" diameter of trunk.

**Shrubs:** For one gallon containers use <sup>1</sup>/<sub>4</sub> pound (1/2 cup) mixed thoroughly. For five gallon containers use 1 pound (2 cups) of product mixed with soil.





1500 Uhler Rd. Easton, PA 18040 • 800-732-8873 Fax: 610-250-7840



#### **Directions for use**

#### Turf (all grasses)

Apply 10 pounds of 5-4-5 per 1000 square feet of turf area (1/2 lb of nitrogen per 1000 sq ft), 4 to 6 times a year as needed. For best results, adequate irrigation should be practiced after application and throughout the growing season.

#### Shrubs

Apply 1 pound of 5-4-5 around the base of the plant and lightly work into the soil, being careful not to disturb surface roots. Larger shrubs or stressed plants will benefit from larger feedings.

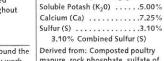
#### Trees

For young or small trees (1 to 3 inch diameter) apply 2 to 3 pounds of 5-4-5 per inch of trunk diameter evenly under the canopy drip line. Increase the application rate to 3 to 4 pounds for larger trees. Apply in Spring and Fall, thoroughly watering after each application.

Manufactured for: **EarthWorks** 1500 Uhler Road Easton, PA 18040 www.earthworksfirst.com

Net Weight:

#### 50 pounds 22.68 kilograms



**Guaranteed Analysis** 

2,70% Water Insoluble Nitrogen\*

Available Phosphate (P205). .4.00%

1.30% Ammoniacal Nitrogen

1.00% Other Water Soluble

Nitrogen\*\*

manure, rock phosphate, sulfate of potash, ammonium sulfate and methylene urea.

\* 1.45% water insoluble nitrogen from composted poultry manure 1.25% water insoluble nitrogen

\*\* .70% water soluble nitrogen from composted poultry manure .30% water soluble nitrogen

**Suggested Spreader Settings** 5-4-5 Standard Grade Spreade Nitrogen in Ib/1000 sq ft pread Width 0.5 1.0 12' 6.8 84 Spyker Scott's R8-A 10' N R 1/2 (cone 8) AccuPro 2000 10' 0 T 1/2 (cone 8) Vicon 28' 50 71 25' 8.25 10 Lely These settings were calibrated and field tested. Age, condition of spreader, speed of operator and evenness of terrain may require adjustment of setting for desired coverage Vicon spreader settings are based on 540 rpm and a ground speed of 4.7 mph.



from methylene urea.

from methylene urea.

Lely spreader settings are based on 425 rpm and a ground speed of 4.7 mph.



Pull narrow tape to open A

## **EarthWorks**<sup>®</sup> 5-4-5



#### **Standard Grade**

**Covers 5,000 square feet** at 1/2 lb Nitrogen per 1000 sq ft

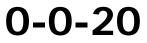
Prilled

Net Weight:

50 pounds 22.68 kilograms









#### DESCRIPTION

Cascade Plus Fertilizer combines the proven water infiltration chemistry of Cascade Plus with a unique fertilizer blend. It is designed for golf courses, athletic fields, sports turf, landscapes and park and recreation applications.

#### BENEFITS

- Delivers long lasting wetting agent and fertilizer in one application.
- Enhances water management, water efficiency and turf quality.
- Prevents localized dry spot.
- Accelerates wilt recovery from drought.
- Reduces the need for repeat spray applications.
- Reduces labor costs and turf maintenance.
- Corrects hydrophobic soil conditions.

#### **GUARANTEED ANALYSIS**

Soluble Potash (K <sub>2</sub> O)	20.0%
Sulfur (S)	
Calcium (Ca)	3.0%
<b>Derived from:</b> Potassium sulfate and calcium sulfate.	

#### NONPLANT FOOD INGREDIENTS, ACTIVE INGREDIENTS:

APPLICATION PRECAUTIONS

- Apply to dry turf or foliage. Irrigation is recommended as soon as possible after application.
- Iron and other plant nutrients can cause staining of sidewalks. Sweep walkways prior to irrigation.
- Keep away from pools, ponds, etc. Do not contaminate potable water.

#### **APPLICATION RATES: TURFGRASS**

Lbs of	Lbs. of	Square	Oz. Cascade		utrient Sq. Ft.	
Product per 1,000 Sq. Ft.	Product per Acre	Feet per Bag	Plus per 1000 Sq. Ft.	N P		к
5	217.8	10000	8	0	0	1.0
6	261.4	8333	9.6	0	0	1.2
7	304.9	7143	11.2	0	0	1.4
8	348.5	6250	12.8	0	0	1.6
9	392.0	5556	14.4	0	0	1.8
10	435.6	5000	16	0	0	2.0

#### **APPLICATION RECOMMENDATION**

Use at 5 lbs. per 1000 ft<sup>2</sup> to obtain 8 ounces of Cascade Plus per 1000 ft<sup>2</sup>.

#### SPREADER SETTINGS

Big Foot	G–H
Spyker	
Lesco (029600)	E–E½
Scotts (R8A)	I½–J
Earthway	

Note: Spreader settings are guidelines only. Spreaders should be checked for accuracy and calibrated by the user. For the most current settings check <u>www.precisionlab.com</u>.

#### SGN: 120

Bulk Density: 63 lbs./ft3

Note: SGN & Bulk Density are lot specific. Actual numbers may vary slightly.

#### KEEP OUT OF REACH OF CHILDREN CAUTION

#### PRECAUTIONARY STATEMENTS

For outdoor use only.

#### PERSONAL PROTECTIVE EQUIPMENT (PPE)

If possibility for eye contact exists, wear protective eyewear. Cover open sores.

#### STATEMENT OF PRACTICAL TREATMENT

If In Eyes:	Flush eyes with plenty of water for 15 minutes.
	Seek medical attention if irritation persists.
If On Skin:	Wash with soap and water. Seek medical
	attention if irritation persists.
If Inhaled:	Move individual to fresh air. If breathing is
	difficult, give oxygen. If not breathing, give
	artificial respiration. Seek immediate medical
	attention.
If Swallowed:	Drink plenty of water.

#### STORAGE AND DISPOSAL

Store in a dry location in temperatures above 30°F. Dispose of in accordance with federal, state and local requirements. May be placed in household waste. Do not reuse packaging. Dispose of packaging when empty.

#### CONDITIONS OF SALE

Note: Read the information contained herein before buying or using this product. If the stated terms are not acceptable, return the product at once, unopened. It is critical that this product be used and mixed only as specified on this label. Neilher the manufacturer nor the seller makes any representation or warranty, expressed or implied, with respect to the results from the use of this material. Buyer and user assume all risks of use and/or handling. Precision Laboratories, LLC warrants that this material is reasonably fit for use as specified on this label. No agent or representative is authorized to make any other representations concerning this material. Unforeseen factors beyond Precision's control prevent elimination of risks in connection with the use of lis chemicals. Such risks include, but are not limited to, damage to plants and/or crops to which the material is applied, or lack of complete control and damage caused by drift to other plants or crops. Such risks may occur even though the product is reasonably fit for use as stated therein and even though label directions are followed. Follow directions carefully. Timing, mixture, method of application, weather and other conditions are influencing factors in the use of this product and are beyond the control of the seller. Except to the extent prohibited by applicable law, the exclusive remedy of the user or buyer and the limit of liability of the company or any other seller for any and all losses, personal injuries or damages resulting from the use of this product, shall be the purchase price paid by the user or buyer for the quantity of product involved.

### SPECIMEN LABEL

Cascade is a trademark of Precision Laboratories, LLC

© PRECISION LABORATORIES, LLC, Waukegan, IL 60085 USA

For 24-hour technical assistance when using this product in the USA and Canada, call: 1-800-323-8351 For 24-hour emergency service when using this product in the USA and Canada, call CHEMTREC: 1-800-424-9300

For 24-hour emergency service when using this product in the USA and Canada, call CHEMTREC: 1-800-424-9300 7/2012 F1467

Precision Laboratories, LLC 1429 S. Shields Dr., Waukegan, IL 60085 Phone: (847) 596-3001 Fax: (847) 596-3017 Customer Service: (800) 323-6280 E-Mail: info@precisionlab.com Web Site: www.precisionlab.com

# Country Club. FERTILIZER

FAIRWAY GRADE FORMULA HOMOGENEOUS GRANULES FOR PROFESSIONAL TURF



	Sp	eed	Width	Settings			Speed		Width	Setti	ngs
Spreader	Ground	PTO	of	1#	1⁄2 #	Spreader	Ground	PTO	of	1#	½ #
	MPH	RPM	Coverage	$P_{2}O_{5}$	P <sub>2</sub> 0 <sub>5</sub>	05		RPM	Coverage	P <sub>2</sub> 0 <sub>5</sub>	P20
LebanonTurf	3		8 ft.	5	4	Lesco® (Letter Dial)	3		8 ft.	K	н
Andersens AccuPro®	3		8 ft.	0	н	PennMulch® HVO	3		8 ft.	0	J
Earthway <sup>®</sup> Rotary	3		8 ft.	18	15	ProScape® SS	3		8 ft.	0	J
Gandy®	3			35	30	Spyker	3		8 ft.	5	4
Lely (HR, W 1250, 1500, 2010)	5		39 ft.	7II	<b>5</b> II	Vicon (all models)	5	540	35 ft.	30	25

These settings were calibrated and field tested. However, age and condition of spreader, speed of operation, and evenness of terrain may require slightly different settings for desired coverage.

Country Club and the Lebanon Diamond are registered trademarks of Lebanon Seaboard Corporation.

Fertilizer may cause irritation of eyes, nose, throat and skin. In case of contact with skin or eyes, flush with plenty of water; for eyes, get medical attention.

#### KEEP OUT OF REACH OF CHILDREN. CAUTION



For technical assistance or more information about our products visit www.LebanonTurf.com Manufactured by:

> Lebanon Seaboard Corporation 1600 E. Cumberland St. • Lebanon, PA 17042 Made in the U.S.A. www.LebanonTurf.com



FAIRWAY GRADE F HOMOGENEOUS GRANULES FOR F COVERS 12,500 SQ. F	ROFESSIONAL TURF
<b>13-25-1</b> GUARANTEED ANALYSIS	CUIDE AVER HISSON 195
Total Nitrogen (N)13%13.0% Ammoniacal Nitrogen25%Available Phosphate (P205)25%Soluble Potash (K20)12%Sulfur (S)5.7%5.7% Combined Sulfur (S)5.7%Iron (Fe)0.5%0.05% Water Soluble Iron (Fe)0.5%Derived From: Ammonium Phosphate, Ammonium Sulfate, Muriate of Potash. Chlorine (Cl) not more than8.0%	0 88685 35573 8
	F699 <b>21-35573</b>

NOTICE: This product contains the secondary nutrient iron. Iron may stain concrete surfaces and should not be applied on dry or water dampened concrete and should be removed from these areas promptly by sweeping or blowing. Do not wash off with water.

Information regarding the contents and levels of metals in this product is available on the Internet at: http://www.regulatory-info-lebsea.com

FOR FLORIDA: We recommend that you follow the Golf Course BMP's at:

http://www.dep.state.fl.us/water/nonpoint/docs/nonpoint/glfbmp07.pdf

#### DIRECTIONS FOR USE

Apply during the turf growing season or work into the soil prior to seeding.

To feed at the rate of 11/2 lb. Available Phosphate per 1,000 sq. ft., apply this product at 6 lbs. per 1,000 sq. ft. or 261 lbs. per acre. Supplemental applications of lawn fertilizer are needed to achieve a minimum 1 pound nitrogen per 1,000 sq. ft.

SUGGESTED SPREADER SETTINGS											
	Sp	eed	Width	Setti	Settings		Speed		Width	Setti	ngs
Spreader	Ground	PTO	of	1#	1⁄2 #	Spreader	Ground	PTO	of	1#	1⁄2 #
	MPH	RPM	Coverage	P <sub>2</sub> 05	P <sub>2</sub> 05		MPH	RPM	Coverage	P205	P <sub>2</sub> 0 <sub>5</sub>
LebanonTurf	3		8 ft.	5	4	Lesco® (Letter Dial)	3		8 ft.	K	н
Andersens AccuPro®	3		8 ft.	0	н	PennMulch® HVO	3		8 ft.	0	J
Earthway® Rotary	3		8 ft.	18	15	ProScape® SS	3		8 ft.	0	J
Gandy®	3			35	30	Spyker	3		8 ft.	5	4
Lely (HR, W 1250, 1500, 2010)	5		39 ft.	7II	5II	Vicon (all models)	5	540	35 ft.	30	25

These settings were calibrated and field tested. However, age and condition of spreader, speed of operation, and evenness of terrain may require slightly different settings for desired coverage.

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#### KEEP OUT OF REACH OF CHILDREN. CAUTION



For technical assistance or more information about our products visit www.LebanonTurf.com Manufactured by:

Lebanon Seaboard Corporation

1600 E. Cumberland St. • Lebanon, PA 17042

Made in the U.S.A. www.LebanonTurf.com

## 50 Lbs. (22.7 kg) Net Weight

## SILI-CAL SS

#### Granulated Premium Greens Fertilizer plus Soil Conditioner

#### **GUARANTEED ANALYSIS:**

Calcium ( Ca )	21.00
Total Magnesium as ( Mg )	2.50
2.00 % Water Soluble Magnesium (Mg)	
<b>Derived From: Calcium Silicate and Magnesium</b>	Sulfate

#### **SOIL CONDITIONER**

Guaranteed Analysis Silicone Dioxide (Si02)	29.00
Total Other Ingredients:	71.00
<b>Derived From: Calcium Silicate</b>	

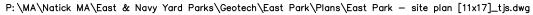
#### **DIRECTIONS FOR USE**

Soil testing prior to application recommended. An initial application rate of 20lbs/1000 sq. ft. is suggested, based on soil analysis. After adequate silicon levels in the soil are achieved, it is suggested that SILI-CAL *SS* be applied once per month at a rate of 10 lbs pounds per 1,000 sq. ft.; not to exceed 50 lbs per 1000 sq. ft. annually.

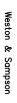
#### **Calcium Silicate Corporation**

#### Columbia, Tennessee; Lake Harbor, Florida Mark C. Elizer, President, Ph: (863) 902-0217, Fax: (863) 902-0107

Calcium Silicate Corporation conducts ongoing product testing to assure product safety, however we cannot assume responsibility for misuse of the product, misapplication or any unintended consequences. As such, the end user assumes full responsibility for product use determinations and application.







Weston & Sampson					oñ	<u>PROJE</u> East Pa Rehabilit Natick,	ark ation	BORING No. SHEET PROJECT No. CHECKED BY	B-1 1 OF 1 2160679.G Tom Strike, PE		
BORIN Forei <b>NSE F</b>			ical Drilling Se Newton Toner	ervices Inc.		BORING LOCATION     See attached plate       GROUND SURFACE ELEV.     160 ft. ±       DATE START     05/11/17			lan. VERT. DATUM NAVD88 DATE END 05/11/17		
ЛЕТН	ODS:	Hollow-s	stem augers. Sta	ndard penetrat	ion tests (SPT)		GR	OUNDWATER OB	SERVATIONS		
		at 2-ft in				DATE	TIME	WATER AT	CASING AT	STABILIZATION TIME	
AMPI	_ER:		oon sampler (2" C			5/11/17		20 ft. ±		WET SAMPLE	
	MENT:	-	. automatic hamr ounted drill rig; 4	0	·						
		TIUCK III			stern augers.						
DEPTH	CASING			SAMPLE		SAN	IPLE DESCRIPTI	ON	COMMENTS	STRATUM	
(ft.) 0	BLOWS	No. S1	REC/PEN (in.) 12/24	DEPTH (ft.) 0-2	BLOWS/6" 3-4-4-3	Loose, brown, fine to		some gravel trace			
0			12/24	0-2	5-4-4-5	silt; moist. [FILL]	COAISC CAND,	some gravel, trace			
2		S2	6/24	2-4	3-2-2-2	Very loose, brown, fir trace silt; moist. [FILL		ND, some gravel,			
							-1				
4		S3	11/24	4-6	6-2-2-1	Very loose, brown, fir	ne to coarse SA	ND, some gravel.		FILL	
-			11/24		0221	trace silt; moist. [FILL		, como graroi,			
			1.0.1								
6		S4	13/24	6-8	2-2-1-2	Very loose, brown, fir trace silt, trace debris					
8		S5	11/24	8-10	5-3-3-2	Loose, brown, fine to silt; moist.	coarse SAND,	little gravel, trace			
10		S6	19/24	10-12	5-4-5-5	Loose, brown, fine to	coarse SAND,	trace gravel, trace			
						silt; moist.					
12		S7	18/24	12-14	6-6-6-6	Medium dense, brow	n. fine to coarse	SAND. trace			
						gravel, trace silt; moi		·			
14		S8	17/24	14-16	7-6-7-8	Medium dense, brow gravel, trace silt; moi		m SAND, trace		SAND	
16		S9	20/24	16-18	9-8-10-10	Medium dense, brow gravel, trace silt; moi		m SAND, trace			
18		S10	19/24	18-20	10-11-11-13	Medium dense, brow trace gravel; moist.	n, fine to mediu	n SAND, little silt,	(1)		
20						End of boring at 20 ft					
20											
-											
22						{					
						1					
24											
27						4					
	GRANU	JLAR S	OILS	COHES	IVE SOILS	COMMENTS:				<u>I</u>	
	WS/FT		DENSITY	BLOWS/FT	CONSISTENCY		wet sample.				
	0-4	VE	RY LOOSE	0-2	VERY SOFT						
	4-10 0-30	MET		2-4	SOFT						
	0-30 0-50	MEL	DIUM DENSE DENSE	4-8 8-15	MEDIUM STIFF STIFF						
	> 50	VE	RY DENSE	15-30	VERY STIFF						
		ES:		> 30	HARD						
	RAL NOT		REPRESENT THE	APPROXIMATE	BOUNDARY BETV	VEEN SOIL TYPES. TRAN	SITIONS MAY BE G	RADUAL.			
WATE	R LEVEL RE	ADINGS H	AVE BEEN MADE	IN THE DRILL H	OLES AT TIMES AN	D UNDER CONDITIONS S	TATED ON THIS BO	ORING LOG. FLUCTUATIO	ONS IN THE LEVEL OF		
GROU	NDWATER N	IAY OCCL	IR DUE TO OTHER	FACTORS THA	N THOSE PRESEN	T AT THE TIME MEASURE	MENTS ARE MADE		BORING No.	B-1	

BORING No.

Weston & Sampson						<u>PROJECT</u> East Park Rehabilitation Natick, MA	BORING No. SHEET PROJECT No. CHECKED BY	1	B-2 1 OF 1 2160679.G Tom Strike, PE	
ORING Co. OREMAN <b>/SE REP.</b>		Technical Drilling Services Inc. Darwin Newton Brian Toner				BORING LOCATION         See attached           GROUND SURFACE ELEV.         165 ft. ±           DATE START         05/11/17		n. VERT. DATUM DATE END	NAVD88 05/11/17	
IETHODS: SAMPLER: QUIPMENT:		Hollow-stem augers. Standard penetration tests (SPT) at 2-ft and 5-ft intervals. Split-spoon sampler (2" OD,1-3/8" ID) driven 24 in. with a 140-lb. automatic hammer falling 30 in. per blow. Truck mounted drill rig; 4-1/4" ID hollow-stem augers.				GROUNDWATER OBSERVATIONS				
						DATE TIME WATER AT		CASING AT	STABILIZATION TIME	
EPTH	CASING					SAMPLE DESCRIPTION		COMMENTS	STRATUM	
(ft.) 0	BLOWS	No. S1	REC/PEN (in.) 6/24	DEPTH (ft.) 0-2	BLOWS/6" 6-8-10-8	1" TOPSOIL			1" TOPSOIL	
						Medium dense, brown, fine to coarse gravel, trace silt; moist. [FILL]	SAND, some			
2		S2	13/24	2-4	15-23-28-42	/ery dense, brown-gray, gravelly fine to coarse SAND, race silt; moist [FILL]				
4		S3	4/6	4-4.5	100/6"	Very dense, brown, fine to coarse SA little silt; moist. [FILL]	ND, some gravel,			
								(1)	FILL	
6										
8		S4	17/24	8-10	44-22-19-17	Dense, brown-gray, fine to coarse sa silt; moist. [FILL]	ndy GRAVEL, trace			
10		S5	15/24	10-12	10-7-7-9	Top 3" - Gray, gravelly fine to coarse moist. [FILL] Medium dense, brown, fine to coarse				
12		S6	18/24	12-14	9-8-6-7	race silt; moist. Medium dense, brown, fine to coarse SAND, some gravel, trace silt; moist.				
14		\$7	20/24	14-16	3-4-5-6	Loose, light brown, fine to medium S/ moist.	AND, trace silt;			
16		S8	22/24	16-18	8-7-8-8	Medium dense, light brown, fine to medium SAND, little silt; moist.				
18		S9	21/24	18-20	4-6-6-7	Medium dense, light brown, fine to medium SAND, little silt; moist.			SAND	
20		S10	21/24	20-22	6-8-8-8	Medium dense, light brown, fine to m silt; moist.	edium SAND, little			
22										
24		S11	22/24	23-25	13-8-9-10	Medium dense, light brown, fine to m silt; moist.	edium SAND, little			
	GRAN				IVE SOILS	End of boring at 25 ft. COMMENTS:				
BLOWS/FT		DENSITY BLOWS/F		BLOWS/FT	CONSISTENCY		4.5 ft. and 7.5 ft. (po	ssible boulder).		
0-4 4-10		VERY LOOSE 0-2 LOOSE 2-4		VERY SOFT SOFT						
	I-10 D-30		LOOSE NUM DENSE	2-4 4-8	SOF I MEDIUM STIFF					
30-50		DENSE 8-15 STIF		STIFF						
> 50				VERY STIFF HARD						
ENE	RAL NOT	ES:								

BORING No.

B-2

Dervice Newton         OROUND SURFACE LEV.         115.15.12.         VERT. DATUM         NAVDB8           THOOS         Intelevation sages. Sended perimetation test. (SPT)         Senderstamma.         GROUND/VATER OBSERVATIONS         ORITIZE	Weston & Sampson					oñ	PROJECT East Park Rehabilitation Natick, MA	BORING No. SHEET PROJECT No. CHECKED BY	1	B-3 OF 1 2160679.G Tom Strike, PE
MPLET:         mining of transmit         mining of transmit<	FOREMAN Darwin Newton G		GROUND SURFACE ELEV. 161.5 ft. ± VERT. DATUM							
MELEE: 3 3 4 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	1ETHC	DDS:	Hollow-s	stem augers. Sta	ndard penetrat	ion tests (SPT)	GR	OUNDWATER OB	SERVATIONS	
Index information particular parte partinare particular particular particular particular particul			-				DATE TIME	WATER AT	CASING AT	STABILIZATION TIME
bit         BLOWS         No.         REFUND IN THE INDUCES         SAME LESCENTION         COMMENTS         STIDUUM           0         1         7724         0.2         2415.23         STOPSOL         Medun denie, traw, gravely fine to coarse SAND, trave sit, molit, fill in the set it, molit, fill in the coarse SAND, trave sit, molit, fill in the coarse SAND, some gravel, trave sit, molit, fill in the coarse SAND, some gravel, trave sit, molit, fill in the coarse SAND, some gravel, trave sit, molit, fill in the coarse SAND, some gravel, trave sit, molit, fill in the coarse SAND, some gravel, trave sit, molit, fill in the coarse SAND, trave sit, molit, fill in the coarse sit, molit, molit, molit, molit, molit, molit, molit, molit,			a 140-lb. automatic hammer falling 30 in. per blow.			. per blow.	G	ROUNDWATER NOT	OBSERVED	
Image: Solution of the second secon	DEPTH (ft.)		No.			BLOWS/6"	SAMPLE DESCRIPTI	ON	COMMENTS	STRATUM
Image: Normal State         State         State         State         Fill           2         S2         1524         2-4         2-17.16-15         State	0		S1	7/24	0-2	2-4-15-23				5" TOPSOIL
Image: Normal State         State <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>b coarse SAND,</td> <td></td> <td></td>								b coarse SAND,		
Image: Normal State         State <td></td>										
Image: Normal Section 1         Section 2         Section 2 </td <td>2</td> <td></td> <td>S2</td> <td>16/24</td> <td>2-4</td> <td>22-17-16-15</td> <td></td> <td>barse SAND, trace</td> <td></td> <td></td>	2		S2	16/24	2-4	22-17-16-15		barse SAND, trace		
Image: strain of the			<u> </u>				Siit, MOISt. [FILL]			FILL
0         S4         14/24         6-8         8-97-5         Top 10" - Medium dense, brown, fine to cearee SAND, some gravel, tace sitr, moist.           8         S5         14/24         8-40         2-3-3-5           10         S6         14/24         8-10         2-3-3-5           10         S6         14/24         1-12         5-4-5-5           10         S6         18/24         10-12         5-4-5-5           11         S6         18/24         10-12         5-4-5-5           14         S8         22/24         14-16         3-6-5-6           14         S9         22/24         14-16         3-6-5-6           18/1         Medium dense, light brown, fine to medium SAND, ittle sitt, most.         SAND           14         S10         24/24         18-20         7-8-10-11           18/1         Medium dense, light brown, fine to medium SAND, ittle sitt, most.							1			
Image: Second	4		S3	12/24	4-6	16-15-10-8		SAND, some		
Image: Second							gravel, trace silt; moist. [FILL]			
Image: Some gravel, taxes sitt, moist.         Some gravel, taxes sitt, moist.           8         35         14/24         8-10         2:3-35           10         35         14/24         8-10         2:3-35           10         35         14/24         8-10         2:3-35           10         36         18/24         10-12         5:4-55           10         36         18/24         10-12         5:4-55           12         37         19/24         12-14         4:6-6-7           14         38         22/24         14-16         3:6-5-6           14         38         22/24         16-18         7:6-8-8           16         50         22/24         16-18         7:6-8-8           16         50         22/24         16-18         7:6-8-8           17         12/24         18-20         7:8-10-11         Medium dense, light brown, fine to medium SAND, little sitt, most.           18         510         24/24         18-20         7:8-10-11         Medium dense, light brown, fine to medium SAND, little sitt, most.           24         12         12         12         12         12         12           24         12				1			1			
Image: Normality of the second state state of the second state state of the second state st	6		S4	14/24	6-8	8-9-7-5		to coarse SAND,		
Image: Note of the second se								um SAND. trace silt		
Image: second										
Image: Normal Sector	8		S5	14/24	8-10	2-3-3-5	Loose, light brown, fine to medium SA	AND, trace silt;		
Image: Stand Stands							moist.			
Image: Stand Stands										
Image: State of the s	10		S6	18/24	10-12	5-4-5-5	Loose, light brown, fine to medium SA	AND, trace silt;		
A       Image: Site of the second secon							moist.			
A       Image: Site of the second secon							-			
A       Image: Site of the second secon	12		S7	19/24	12-14	4-6-6-7	Medium dense. light brown, fine to m	edium SAND. trace		
Image: state in the second state in the sec			0.	.0/21	.2			,		SAND
16       S9       22/24       16-18       7-6-8-8         16       S9       22/24       16-18       7-6-8-8         18       S10       24/24       18-20       7-8-10-11         18       S10       24/24       18-20       7-8-10-11         20       Image: Site of the site										SAND
16       S9       22/24       16-18       7-6-8-8         16       S9       22/24       16-18       7-6-8-8         18       S10       24/24       18-20       7-8-10-11         18       S10       24/24       18-20       7-8-10-11         20       Image: Site of the site	14		S8	22/24	14-16	3-6-5-6	Medium dense, light brown, fine to m	edium SAND, little		
18       S10       24/24       18-20       7-8-10-11       Medium dense, light brown, fine to medium SAND, little         20       1       1       1       1       1       1         20       1       1       1       1       1       1         20       1       1       1       1       1       1         20       1       1       1       1       1       1         21       1       1       1       1       1       1         22       1       1       1       1       1       1       1         24       1       1       1       1       1       1       1       1         24       1 <t< td=""><td>••</td><td></td><td></td><td></td><td></td><td></td><td></td><td>· · · · · · · · · · · · · · · · · · ·</td><td></td><td></td></t<>	••							· · · · · · · · · · · · · · · · · · ·		
18       S10       24/24       18-20       7-8-10-11       Medium dense, light brown, fine to medium SAND, little         20       1       1       1       1       1       1         20       1       1       1       1       1       1         20       1       1       1       1       1       1         20       1       1       1       1       1       1         21       1       1       1       1       1       1         22       1       1       1       1       1       1       1         24       1       1       1       1       1       1       1       1         24       1 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td>-</td><td></td><td></td><td></td></t<>							-			
18       S10       24/24       18-20       7-8-10-11       Medium dense, light brown, fine to medium SAND, little         20       1       1       1       1       1       1         20       1       1       1       1       1       1         20       1       1       1       1       1       1         20       1       1       1       1       1       1         21       1       1       1       1       1       1         22       1       1       1       1       1       1       1         24       1       1       1       1       1       1       1       1         24       1 <t< td=""><td>16</td><td></td><td>S9</td><td>22/24</td><td>16-18</td><td>7-6-8-8</td><td>Medium dense. light brown, fine to m</td><td>edium SAND. little</td><td></td><td></td></t<>	16		S9	22/24	16-18	7-6-8-8	Medium dense. light brown, fine to m	edium SAND. little		
20       Image: Contract of the set o					10 10			· · · · · · · · · · · · · · · · · · ·		
20       Image: Contract of the set o										
20       Image: Contract of the set o	18		\$10	24/24	18-20	7-8-10-11	Medium dense light brown fine to m	edium SAND little		
22       Image: Construction of the structure of th	10		010	24/24	10-20	7-0-10-11				
22       Image: Construction of the structure of th							]			
22       Image: Construction of the structure of th	20						End of boring at 20 ft			
24       Image: Construction of the structure of th	20			1						
24       Image: Construction of the structure of th							]			
24       Image: Construction of the structure of th	···-						4			
GRANULAR SOILS       COHESIVE SOILS       COMMENTS:         BLOWS/FT       DENSITY       BLOWS/FT       CONSISTENCY         0-4       VERY LOOSE       0-2       VERY SOFT         4-10       LOOSE       2-4       SOFT         10-30       MEDIUM DENSE       4-8       MEDIUM STIFF         30-50       DENSE       8-15       STIFF         > 50       VERY DENSE       15-30       VERY STIFF         > 30       HARD       HARD       HARD         ENERAL NOTES:         THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITIONS MAY BE GRADUAL.         WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THIS BORING LOG. FLUCTUATIONS IN THE LEVEL OF         GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS ARE MADE.	22						1			
GRANULAR SOILS       COHESIVE SOILS       COMMENTS:         BLOWS/FT       DENSITY       BLOWS/FT       CONSISTENCY         0-4       VERY LOOSE       0-2       VERY SOFT         4-10       LOOSE       2-4       SOFT         10-30       MEDIUM DENSE       4-8       MEDIUM STIFF         30-50       DENSE       8-15       STIFF         > 50       VERY DENSE       15-30       VERY STIFF         > 30       HARD       HARD       HARD         ENERAL NOTES:         THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITIONS MAY BE GRADUAL.         WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THIS BORING LOG. FLUCTUATIONS IN THE LEVEL OF         GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS ARE MADE.							]			
GRANULAR SOILS       COHESIVE SOILS       COMMENTS:         BLOWS/FT       DENSITY       BLOWS/FT       CONSISTENCY         0-4       VERY LOOSE       0-2       VERY SOFT         4-10       LOOSE       2-4       SOFT         10-30       MEDIUM DENSE       4-8       MEDIUM STIFF         30-50       DENSE       8-15       STIFF         > 50       VERY DENSE       15-30       VERY STIFF         > 30       HARD       HARD       HARD         ENERAL NOTES:         THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITIONS MAY BE GRADUAL.         WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THIS BORING LOG. FLUCTUATIONS IN THE LEVEL OF         GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS ARE MADE.	<u> </u>						4			
BLOWS/FT       DENSITY       BLOWS/FT       CONSISTENCY         0-4       VERY LOOSE       0-2       VERY SOFT         4-10       LOOSE       2-4       SOFT         10-30       MEDIUM DENSE       4-8       MEDIUM STIFF         30-50       DENSE       8-15       STIFF         > 50       VERY DENSE       15-30       VERY STIFF         > 30       HARD       SOFT	24						4			
BLOWS/FT     DENSITY     BLOWS/FT     CONSISTENCY       0-4     VERY LOOSE     0-2     VERY SOFT       4-10     LOOSE     2-4     SOFT       10-30     MEDIUM DENSE     4-8     MEDIUM STIFF       30-50     DENSE     8-15     STIFF       > 50     VERY DENSE     15-30     VERY STIFF       > 30     HARD										
0-4       VERY LOOSE       0-2       VERY SOFT         4-10       LOOSE       2-4       SOFT         10-30       MEDIUM DENSE       4-8       MEDIUM STIFF         30-50       DENSE       8-15       STIFF         > 50       VERY DENSE       15-30       VERY STIFF         > 30       HARD       30       HARD         ENERAL NOTES:         Interstripication lines represent the approximate boundary between soil types. transitions may be gradual.         WARE LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THIS BORING LOG. FLUCTUATIONS IN THE LEVEL OF         GROUNDWATER MAY OCCUR DUE to OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS ARE MADE.			1							
4-10       LOOSE       2-4       SOFT         10-30       MEDIUM DENSE       4-8       MEDIUM STIFF         30-50       DENSE       8-15       STIFF         > 50       VERY DENSE       15-30       VERY STIFF         > 30       B       HARD         ENERAL NOTES:         The STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITIONS MAY BE GRADUAL.         WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THIS BORING LOG. FLUCTUATIONS IN THE LEVEL OF         GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS ARE MADE.			-				4			
10-30     MEDIUM DENSE     4-8     MEDIUM STIFF       30-50     DENSE     8-15     STIFF       > 50     VERY DENSE     15-30     VERY STIFF       > 30     HARD     HARD			VE							
> 50     VERY DENSE     15-30     VERY STIFF       > 30     HARD   ENERAL NOTES: THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITIONS MAY BE GRADUAL. WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THIS BORING LOG. FLUCTUATIONS IN THE LEVEL OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS ARE MADE.			ME	DIUM DENSE		MEDIUM STIFF				
> 30 HARD ENERAL NOTES: THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITIONS MAY BE GRADUAL. WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THIS BORING LOG. FLUCTUATIONS IN THE LEVEL OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS ARE MADE.										
ENERAL NOTES: THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITIONS MAY BE GRADUAL. WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THIS BORING LOG. FLUCTUATIONS IN THE LEVEL OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS ARE MADE.	>	• 50	VE	KY DENSE						
THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES. TRANSITIONS MAY BE GRADUAL. WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THIS BORING LOG. FLUCTUATIONS IN THE LEVEL OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS ARE MADE.	ENEF	RAL NOT	ES:		200		1			
SROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS ARE MADE.				REPRESENT THE		BOUNDARY BETV	VEEN SOIL TYPES. TRANSITIONS MAY BE G	RADUAL.		
									NS IN THE LEVEL OF	
BORING No. B-3	GROU	NDWATER N	MAY OCCL	JR DUE TO OTHER	R FACTORS THA	IN THOSE PRESEN	T AT THE TIME MEASUREMENTS ARE MADE			

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BORING No.

B-3

DREMAN SE REP. ETHODS: AMPLER:	Darwir			om	Rehabilitation Natick, MA	PROJECT No. CHECKED BY		2160679.G Tom Strike, PE
AMPLER:	FOREMAN Darwin Newton G		BORING LOCATION     See attached plan.       GROUND SURFACE ELEV.     166 ft. ±     VERT. DATUM       DATE START     05/11/17     DATE END			NAVD88 05/11/17		
AMPLER:	Hollow-s	stem augers. Sta	ndard penetrat	ion tests (SPT)		OUNDWATER OBS	SERVATIONS	
	at 2-ft in	tervals. oon sampler (2" C	1 2/9" J) di	ivon 24 in with	DATE TIME	WATER AT	CASING AT	STABILIZATION TIME
	a 140-lb	. automatic hamn	ner falling 30 in	. per blow.	GI	ROUNDWATER NOT	OBSERVED	
QUIPMENT:	Truck m	ounted drill rig; 4		stem augers.				
(ft.) BLOWS	No.	REC/PEN (in.)	DEPTH (ft.)	BLOWS/6"	SAMPLE DESCRIPTI	ON	COMMENTS	STRATUM
0	S1	17/24	0-2	10-9-6-4	Top 14" - Medium dense, brown, fine	to coarse SAND,		
					some gravel, trace silt; moist. [FILL] Brown, silty SAND; moist. [FILL]			
2	S2	16/24	2-4	5-14-26-27	Top 7" - Brown, fine to medium SANI gravel; moist. [FILL]	D; little silt, little		
					Dense, gray, gravelly fine to coarse S	SAND, trace silt;		FILL
					moist. [FILL]			
4	S3	19/24	4-6	27-16-36-39	Very dense, brown, fine to coarse SA little silt; moist. [FILL]	ND, some gravel,		
	<u> </u>							
6	S4	20/24	6-8	36-34-32-37	Very dense, brown-gray, fine to coars gravel, little silt; moist.	se SAND, some		
					graver, indie sin, moist.			
	<b>a</b> -			A A A = 4 = 11	Damas karan fi da anti-			
8	S5	13/24	8-10	14-17-16-13	Dense, brown, fine to coarse SAND, silt; moist.	some gravel, trace		
10	00	47/04	40.10	0700	Madium danaa braun fina ta maduu	m SAND little		
10	S6	17/24	10-12	6-7-6-6	Medium dense, brown, fine to mediur gravel, trace silt; moist.	II SAIND, IITTIE		
12	07	14/04	10.14	FFFC	Medium dense, light brown, fine to m	odium SAND little		
12	S7	14/24	12-14	5-5-5-6	silt; moist.	edium SAND, Intie		CAND
								SAND
14	S8	16/24	14-16	8-7-8-9	Medium dense, light brown, fine to m	edium SAND, little		
					silt; moist.	,		
			-					
16	S9	21/24	16-18	5-4-7-8	Medium dense, light brown, fine to m	edium SAND, trace		
					silt; moist.			
18	S10	20/24	18-20	6-7-9-8	Medium dense, light brown, fine to m	edium SAND, trace		
					silt; moist.			
20					End of boring at 20 ft.			
22								
24								
GRANI				IVE SOILS	COMMENTS:	1		·
BLOWS/FT 0-4		DENSITY RY LOOSE	BLOWS/FT 0-2	CONSISTENCY VERY SOFT				
0-4 4-10		LOOSE	0-2 2-4	SOFT				
10-30	MED	DIUM DENSE	4-8	MEDIUM STIFF				
30-50			8-15	STIFF				
> 50	VE	RY DENSE	15-30 > 30	VERY STIFF HARD				
SENERAL NOT	ES:				•			
					VEEN SOIL TYPES. TRANSITIONS MAY BE G D UNDER CONDITIONS STATED ON THIS BC			

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BORING No.

B-4

Weston & Sampson				ampso	oñ	<u>PROJECT</u> East Park Rehabilitation Natick, MA	BORING No. SHEET PROJECT No. CHECKED BY	1	B-5 OF 1 2160679.G Tom Strike, PE
FOREMAN Darwin Newton G		BORING LOCATION GROUND SURFACE ELEV. DATE START		ı. VERT. DATUM DATE END	NAVD88 05/11/17				
1ETH	ODS:	Hollow-s	stem augers. Sta	andard penetrat	ion tests (SPT)	GR	OUNDWATER OB	SERVATIONS	
		at 2-ft in				DATE TIME	WATER AT	CASING AT	STABILIZATION TIME
ampi Quipi	LER: MENT:	a 140-lb	Split-spoon sampler (2" OD,1-3/8" ID) driven 24 in. with a 140-lb. automatic hammer falling 30 in. per blow. Truck mounted drill rig; 4-1/4" ID hollow-stem augers.			G	ROUNDWATER NOT	OBSERVED	
EPTH (ft.)	CASING BLOWS	No.	REC/PEN (in.)	SAMPLE DEPTH (ft.)	BLOWS/6"	SAMPLE DESCRIPTI	ON	COMMENTS	STRATUM
0		S1	16/24	0-2	2-3-8-9	11" TOPSOIL Medium dense, brown, fine to coarse	SAND some		11" TOPSOIL
						gravel, little silt; moist. [FILL]	or and, some		
_									
2		S2	12/24	2-4	7-6-5-4	Medium dense, brown, fine to coarse gravel, trace to little silt; moist. [FILL]	SAND, some		FILL
						g,			
,-	L	00	= 10 -		0.0.1.5	Lance expect because the first			
4		S3	5/24	4-6	2-2-1-3	Loose, orange-brown, silty fine to me gravel, trace organics (roots); moist.	ouum SAND, trace		
									BURIED TOPSOIL
6		S4	0/24	6_9	4-6-9-10	No recovery.			
6		54	0/24	6-8	4-6-9-10	no recovery.			
8		S5	6/24	8-10	2-5-10-8	Medium dense, brown-gray, fine to c	parse SAND some		
0		- 55	0/24	0-10	2-5-10-0	gravel, trace silt; moist.	barse OAND, some		
10		S6	11/24	10-12	6-4-4-7	Loose, brown, fine to coarse SAND,	little gravel, trace		
10		00	11/24	10-12	0 + + 1	silt; moist.	and gravely have		
12		S7	12/24	12-14	4-8-8-7	Medium dense, light brown, fine to co	arse SAND, some		
						gravel, trace silt; moist.	,		SAND
14		S8	16/24	14-16	4-4-4-5	Loose, light brown, fine to medium S	AND, trace gravel,		
						trace silt; moist.			
16		S9	20/24	16-18	5-5-4-6	Loose, light brown, fine to medium S.	AND, trace gravel,		
						trace silt; moist.			
18		S10	20/24	18-20	8-8-9-11	Medium dense, light brown, fine to m	edium SAND, little		
						silt; moist.			
						1			
20						End of boring at 20 ft.			
		L				1			
	<u> </u>					4			
22						1			
						1			
<u></u>						4			
24						4			
						1			
RI C	GRANU		OILS DENSITY	COHES BLOWS/FT	IVE SOILS CONSISTENCY	COMMENTS:			
	0-4		RY LOOSE	0-2	VERY SOFT	1			
	4-10		LOOSE	2-4	SOFT				
	0-30 0-50		DIUM DENSE DENSE	4-8 8-15	MEDIUM STIFF STIFF				
	> 50		RY DENSE	8-15 15-30	VERY STIFF				
				> 30	HARD				
	RAL NOT				POUNDABY				
	IKATIFICAT	ON LINES	REPRESENT THE		BOUNDARY BETW	VEEN SOIL TYPES. TRANSITIONS MAY BE G	RADUAL.		
	R LEVEL RE	ADINGS H	AVE BEEN MADE	IN THE DRILL H	OLES AT TIMES AN	ID UNDER CONDITIONS STATED ON THIS BO	RING LOG, FLUCTUATIO	NS IN THE LEVEL OF	

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BORING No.

B-5

TEST PIT LOG				
PROJECT NA	AME/NO. East Park Field/216	TES	Γ PIT NUMBER	
LOCATION	Natick, MA			TP-1
CLIENT	Natick, MA		GROUND SURFACE	
CONTRACTO	DR <u>TDS</u>	FOREMAN: Darwin Newton	ELEVATION	149.5 +/- (NAVD88)
OBSERVED	BY Julie A. Eaton, EIT	DATE <u>5/15/17</u>	DEPTH TO GROUND	VATER
CHECKED B	Y Tom Strike, PE	DATE 5/25/17		Not observed.
DEPTH BELOW				
GROUND		SOIL DESCRIPTION		STRATUM DESCRIPTION
SURFACE (ft.)				
Surface	Grass		aroual maint	
l ,-	Dark brown, fine to coarse slity	SAND, some organics (roots), trace	gravel; moist.	6" TOPSOIL
1	Brown find to coarse gravelly S	AND, trace to little silt, few cobbles,	with sporatic pockats	
2	of dark brown, SAND, some silt		with sporatic pockets	
2		,		
3				
				FILL
4				
5				
	Stump (26" diameter) observed			
6				
	Dark brown, ORGANIC SILT, lit	tle sand; moist.		BURIED TOPSOIL
7				BORIED TOFSOIL
_	Brown, fine to coarse gravelly S	AND, trace silt, few cobbles; moist.		
8				SAND
_				0
9				
	End of test pit at 9 ft.			
10				
11				
12				
12				
13				
14				
15				
_				
16				
_				
17				
18				
19				
20				
	est pit excavated with moderate	difficulty using a 15,000 lb backhoe	TFQ	I PIT NUMBER
	nd a toothed bucket (1/2 cy).		123	TP-1
	linor caving observed below 5 ft.			<u> </u>
	lo seepage observed.		West	on & Sampson
				U

TEST PIT LOG				
PROJECT NA	ME/NO. East Park Field/21606	TES	F PIT NUMBER	
LOCATION	Natick, MA			TP-2
CLIENT	Natick, MA		GROUND SURFACE	
CONTRACTO		FOREMAN: Darwin Newton	ELEVATION	149.5 +/- (NAVD88)
OBSERVED	3Y Julie A. Eaton, EIT	DATE 5/15/17	DEPTH TO GROUNDW	VATER
CHECKED B	Y Tom Strike, PE	DATE 5/25/17		Not observed.
DEPTH BELOW				
GROUND		SOIL DESCRIPTION		STRATUM DESCRIPTION
SURFACE (ft.)				
Surface	Grass			
	Dark brown, fine to coarse silty SA	ND, some organics (roots), trace	gravel; moist.	9" TOPSOIL
1	Brown, fine to coarse gravelly SAN	ID trace silt fow cobbles: moist )	Vory fow pockats of	
2	dark brown, silty SAND. [FILL]	D, trace sitt, lew cobbles, moist.		
2	- end of root zone.			
3				
				SAND FILL
4				
5				
6				
	Dark brown, ORGANIC SILT, little	sand; moist.		
7				BURIED TOPSOIL
8	Brown, fine to coarse SAND, trace	gravel, trace silt; moist.		0.0115
				SAND
9	End of test pit at 9 ft.			
10	End of test pit at 9 ft.			
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
19				
20				
	est pit excavated with moderate diff	iculty using a 15,000 lb backhoe	TES	F PIT NUMBER
	nd a toothed bucket (1/2 cy).		. 20	TP-2
N	linor caving observed below 2 ft.			(
	o seepage observed.		West	on(&)Sampson
			$\smile$ .	

TEST PIT LOG						
PROJECT NAME/NO. East Park Field/2160679 TE					T PIT NUMBER	
LOCATION		Natick, MA				TP-3
CLIENT		Natick, MA			GROUND SURFACE	
CONTRACTO	ЭR	TDS	FOREMAN	Darwin Newton	ELEVATION	151 +/- (NAVD88)
OBSERVED I		Julie A. Eaton, EIT	DATE	5/15/17	DEPTH TO GROUNDV	VATER
CHECKED B	,Υ	Tom Strike, PE	DATE	5/25/17		Not observed.
DEPTH BELOW	1					
GROUND		:	SOIL DESCRI	PTION		STRATUM DESCRIPTION
SURFACE (ft.)						
Surface	Grass	Carte access silty CAN		tracta) traca	- secolo sector	
1 -	Dark brown	n, fine to coarse silty SAN	ND, some orga	inics (foots), trace	gravei; moist.	11" TOPSOIL
· · ·	Brown, fine	e to coarse SAND, trace	gravel, trace s	ilt; moist. [FILL]		7" FILL
2	Dark brown cermaic, as	n, ORGANIC SILT, some sh); moist.	cobbles, little	sand, trace grave	I, trace debris (plastic,	14" BURIED TOPSOIL
3	Orange-bro	own, silty SAND, trace gr	avel, trace org	ganics (fine roots),	few cobbles; moist.	SILTY SAND
4	Brown, fine	e to coarse SAND, little g	ravel, trace sil	t; moist.		
5	1					SAND
6						
7	End of test	t pit at 6 ft.				
8	1					
	4					
9	_					
10	-					
11	-					
12	-					
13	4					
14	1					
15	1					
16	-					
17	-					
18	-					
_	-					
19 						
NOTES: T		vated with moderate diffied during the second strain with moderate diffied during the second strain with the second strain strai	culty using a 1	5,000 lb backhoe	TEST	
		observed below 1.5 ft.				TP-3
	No seepage				West	on & Sampsoñ



Town of Natick



## ADVANCE OF FUNDS IN LIEU OF BORROWING REPORT

(M.G.L. c.40 section 20A)

City/Town/District of NATICK

Purpose of Issue EAST FIELD RENOVATIONS

#### Authorization 2017 FALL ANNUAL TOWN MEETING ART. 10 MOTION B ITEM 3 -M.G.L. ch44 sec. 7

(Date and article of town meeting vote and M.G.L. citation)

(If applicable)

A. Amount of Loan Authorized		\$2,535,000
<ul> <li>Computation of Limit on <u>Total</u> of Advances:</li> <li>B. Unappropriated Free Cash</li> <li>C. Stabilization Fund</li> <li>D. 1% of FY <u>2019</u> Budget</li> <li>E. Greatest of line B, C or D F.</li> <li>F. Other Advances Outstanding</li> </ul>	\$0.00 \$4,570,303 \$1,534,508 \$4,570,303 \$0.00	
<ul><li>G. Remaining Limit (line Eless line F)</li><li>H. Amount to be Advanced - This Issue (not to exceed line G)</li></ul>		\$4,570,303 \$1,600,000

Date of Advance \_\_\_\_\_

Grant Number

Stephen Price - Treasurer

Approved:

Amy K. Mistrot – Chair

Michael J. Hickey, Jr. – Clerk

Jonathan H. Freedman - Member

Susan G. Salamoff –Vice Chair

Richard P. Jennett, Jr. - Member

Date of Repayment to General Fund:

Arti Mehta - Comptroller

## ADVANCE OF FUNDS IN LIEU OF BORROWING REPORT

City/Town/District of NATICK

Purpose of Issue NAVY YARD CAPITAL IMPROVEMENTS

#### Authorization 2017 FALL ANNUAL TOWN MEETING ARTICLE 10 MOTION B ITEM -MGL c.44sec7

(Date and article of town meeting vote and M.G.L. citation)

(If applicable)

A. Amount of Loan Authorized		\$1,600,000
Computation of Limit on <u>Total</u> of Advances: B. Unappropriated Free Cash	¢0.00	
C. Stabilization Fund	\$0.00 \$4,570,303	
D. 1% of FY <u>2019</u> Budget E. Greatest of line B, C or D F.	\$1,534,508	
F. Other Advances Outstanding	\$4,570,303 \$2,535,000	
G. Remaining Limit (line Eless line F)		\$2,035,303
H. Amount to be Advanced - This Issue (not to exceed line G)		\$1,600,000

Date of Advance: \_\_\_\_\_

Grant Number

Stephen Price - Treasurer

Approved:

Amy K. Mistrot – Chair

Susan G. Salamoff –Vice Chair

Jonathan H. Freedman - Member

Richard P. Jennett, Jr. - Member

Michael J. Hickey, Jr. – Clerk

Date of Repayment to General Fund:

Arti Mehta - Comptroller

## ITEM TITLE: Police Chief: Approve Appointment of Two Reserve Police Officers ITEM SUMMARY:

## ATTACHMENTS:

**Description** Memo-Chief Hicks Proposed Appointments **Upload Date** 8/14/2018 8/15/2018 **Type** Cover Memo Cover Memo



**POLICE DEPARTMENT** James G. Hicks, Chief of Police 20 East Central Street Natick, MA 01760 Phone: 508-647-9511 Fax: 508-647-9509

# Memorandum

Date: August 9, 2018

To: Amy K. Mistrot, Chair Board of Selectmen

From: Chief James G. Hicks

RE: Certification Number 05004 Additional Reserve Police Officer Requests

I request your approval to add two additional Reserve Officers to previously submitted Certification Number 05004 for two (2) Reserve Police Officers. Due to the anticipated movement within the department we find it necessary for the additional request for a total of six (6) reserve officers.



POLICE DEPARTMENT

James G. Hicks, Chief of Police

20 East Central Street Natick, MA 01760 Phone: 508-647-9511 Fax: 508-647-9509

## Memorandum

Date: August 15, 2018

To: Amy K. Mistrot, Chair Board of Selectmen

From: Chief James G. Hicks

RE: Appointment of Reserve Officers

I respectfully request the Board of Selectmen as appointing authority for police officers in the Town of Natick appoint the following candidates as Permanent Reserve Police Officers. This appointment should be contingent upon satisfactory completion of a medical examination, final background checks and/or investigations, psychological examination, physical abilities test and any other requirements necessary for successful certification with the Commonwealth of Massachusetts Human Resource Division.

Andrew Watkins – Mr. Watkins is a lifelong Natick resident graduating from Natick High School in 2013 where he played varsity hockey and lacrosse. Upon graduating high school Mr. Watkins attended Salve Regina University graduating in the spring of 2017 with a Bachelor degree in Administration of Justice. Mr. Watkins is currently attending the Massachusetts State Police Municipal Academy at the State Police Academy in New Braintree, Ma. Mr. Watkins is a self-sponsored cadet, agency sponsored by the Natick Police Department. During his interview with our background investigator Mr. Watkins was found by the investigator to be "a mature 23 year old, with true aspirations to becoming a law enforcement officer".

At the end of his senior year at Salve, Mr. Watkins participated in an internship program at the Commonwealth Fusion Center in Maynard Ma where he worked on intelligent matters, and attended a number of Fusion Center trainings, that exposed him to analysts from other agencies. The Commanding Officer of the Fusion Center, State Police Major Scott Range described Mr. Watkins as consciences, hardworking, and one who got along with everyone in the office. After graduating college Mr. Watkins went to work at the Wellesley Country Club prior to being accepted to SPMA #8 at the State Police Academy in New Braintree, which is scheduled to graduate on September 14, 2018.

During his interview with the Departments Hiring Committee it was noted that Mr. Watkins has been directly involved in the caring of his elderly grandmother, which has eased some of the responsibilities of his mother and father as his grandmother resides in the home that they all share. As stated by one member of the Hiring Committee: "His long days and dedication to caring for his grandmother shows his character, loyalty to his family, and his dedication to pursuing his dream of becoming a police officer with the Natick Police Department."

**Derek Butler -** Mr. Butler is a lifelong resident of Natick graduating from Natick High School in 2014. While at Natick High Derek was a standout on both Varsity Hockey and Baseball teams and served as Captain of both teams. Derek was selected by the Massachusetts High School hockey coaches to represent Massachusetts in an All Star game vs Connecticut High School All Stars.

He is currently employed as a Union Laborer, Local #22, with Turner Construction Company in Boston. Fred Barr, Senior Project Manager with Turner Construction described Derek as "a team player and does whatever it takes to get the job done right", he also related that "you don't see many young people these days that really care about their job. Derek really cares about doing his job and doing it to the best of his ability".

Derek comes from a line of Law Enforcement Officers, his grandfather and uncle both retired from the Boston Police Department and his cousin is currently serving in the Gang Unit of the Boston Police Department.

During his interview with the Departments Hiring Committee it was noted that "While it may initially appear that Mr. Butler has not worked in areas that may be a good preparation for a career in Law Enforcement, nonetheless working for a large, union, construction company has allowed him to develop somewhat of a thick skin, along with communication skills with all types of people along with conflict resolution and problem solving skills." Each of these abilities will certainly assist him in his daily duties as a Natick Police Officer.

By-Pass Recommendation – The following candidate appears higher on the certification list than the above recommended candidates: Sean P. Ahern

#### Sean P. Ahern

Mr. Ahern is presently listed tenth on the Civil Service list and was subjected to a thorough background investigation and subsequent interview.

During the process several incidents arose from his work history and general character that raised concern for the selection committee and me. Given the strong background of the other candidates we feel that they are much stronger candidates than Mr. Ahern.

ITEM TITLE:	Sustainability Coordinator: Green Communities Grant - Approve and Sign Seven Contracts
ITEM SUMMARY:	<ul> <li>a. LED lighting: Eliot School &amp; DPW (3)</li> <li>b. VFD (variable free drives) on rooftop units: Police &amp; Fire Departments (2)</li> <li>c. VFD on chilled water pump: Morse Institute Library (1)</li> <li>d. Ductless mini-split: Morse Institute Library (1)</li> </ul>

## ATTACHMENTS:

Description	Upload Date	Туре
Green Communities Grant & Contracts Memo- J. Wilson Martin	8/15/2018	Cover Memo
Grant Award Letter	8/20/2018	Cover Memo
Summary Table	8/20/2018	Cover Memo
Grant Table	8/20/2018	Cover Memo
LED Eliot School	8/15/2018	Cover Memo
LED DPW-Equipment Maintenance	8/15/2018	Cover Memo
LED DPW-Offices	8/15/2018	Cover Memo
VFD Police	8/15/2018	Cover Memo
VFD Fire	8/15/2018	Cover Memo
VFD Morse Institute	8/15/2018	Cover Memo
Ductless Mini-Split Morse Institute	8/15/2018	Cover Memo

# Memorandum



To:	Natick Board of Selectmen
CC:	Melissa A. Malone, Town Administrator
	William Chenard, Deputy Town Administrator
From:	Jillian Wilson Martin, Sustainability Coordinator
Date:	August 15, 2018
Subject:	Green Communities Grant and Contracts

Dear Natick Board of Selectmen:

The Town of Natick was recently awarded \$245,142 from the Massachusetts Department of Energy Resources's (DOER) Green Communities competitive grant program to complete energy efficiency projects at the DPW, Public Safety Building and Morse Institute Library (Appendix, Exhibit 1). The grant covers the majority of the projects' costs; the remainder will be funded by \$33,000 in approved utility incentives and \$57,500 in capital funds that were appropriated at Town Meeting for this purpose (Appendix, Exhibit 2). In total, the projects are expected to reduce Natick's energy use by approximately 260,000 kilowatt-hours (kWh) and 2,700 therms of natural gas, which results in an annual savings of \$43,000.

Today, we are ready to request your approval on the attached contracts for these projects, which qualify as services for energy conservation as allowed under M.G.L c.25A section 14. Each of the projects is less than \$100,000 and subject to prevailing wage. The Town intends to contract with Horizon Solutions and Hobart Energy Services, which are Eversource-approved contractors, to complete the following:

- \$22,223, Eliot School Light Emitting Diode (LED) lighting
- \$33,998, DPW Equipment Maintenance Garage LED lighting (funded by Green Communities grant and capital)
- \$28,814, DPW Administration Offices (Original Space) LED lighting
- \$60,078, Police Station Variable Frequency Drives (VFDs) for rooftop units
- \$49,599, Fire Station VFDs for rooftop units
- \$39,444, Morse Institute Library VFD for chilled water pump (funded by Green Communities grant and capital)
- \$52,334, Morse Institute Library —Ductless mini-split replacement (funded by Green Communities grant and capital)

Please note that several of the contracts reflect slightly higher or lower net costs to the Town than the initial request made to DOER; the net difference is \$23,000 less than anticipated. These changes are due to additional cost savings and higher utility incentives identified following the submission of our grant application. In the past, when total project costs were lower than initially estimated, DOER has allowed Natick to retain the full amount funded by the grant and reduce the Town's contribution. We have made a similar request to DOER this year and expect they will follow this procedure.

Additional background material is provided on the following pages, which serve as an Appendix, including:

- Exhibit 1: Grant award letter from the Department of Energy resources, dated July 19, 2018
- Exhibit 2: Table outlining the estimated cost, utility incentive, Town contribution and energy savings associated with each project, as submitted to Green Communities on March 9, 2018
- Exhibit 3: Memo to the Board of Selectmen describing projects, dated April 2, 2018

Thank you for your consideration of these contracts.

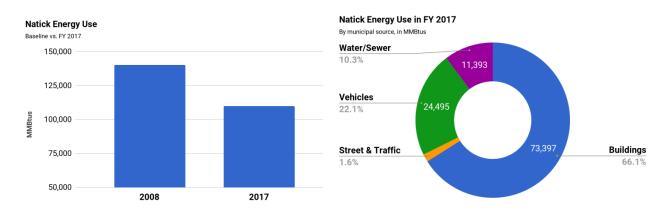
# Memorandum



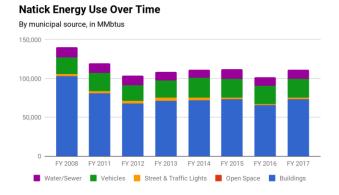
To:	Natick Board of Selectmen
CC:	William Chenard, Acting Town Administrator
From:	Jillian Wilson Martin, Sustainability Coordinator
Date:	March 29, 2018
Subject:	2017 Energy Use Update and Plan for 2018

#### Dear Natick Board of Selectmen:

For the past 10 years, the Town of Natick has sought to reduce its energy use and has implemented a variety of programs and policies in support of this goal. Since first benchmarking municipal energy consumption in 2008, the Town has completed more than 100 energy conservation measures, which are estimated to save more than \$500,000 in electricity, natural gas, oil and other fuel costs annually. As a result of these projects, the Town's energy use has decreased by 20% in less than a decade – from approximately 140,000 MMbtus in Fiscal 2008 to 110,000 MMbtus in Fiscal 2017.



Unfortunately, in Fiscal 2017, Natick's year-over-year energy use increased from 101,000 MMbtus in Fiscal 2016 to 110,000 MMbtus. While much of this increase can be attributed to weather (a colder winter and hotter summer resulted in a greater demand for heating and cooling), an analysis revealed that several large municipal buildings were not operating as efficiently as possible. In response, the Town is working with the Facilities Management team to develop a budget and schedule for commissioning buildings and will be evaluating energy usage from large buildings on a more frequent basis.



#### 2018 Energy Efficiency Projects

Natick is also pursuing a variety of energy efficiency upgrades to further reduce use, with a focus on the sources of high energy consumption and projects with quick paybacks. One source of funding for these projects is the Massachusetts Department of Energy Resources's Green Communities program, which has provided the Town with nearly \$1M since it joined in 2010.

In Calendar Year 2018, the Town has requested Green Communities grants for the following energy efficiency projects:

- DPW Equipment Maintenance Garage and Administrative Offices LED lighting retrofits
- Police and Fire Headquarters Variable Frequency Drives (VFDs) for rooftop units
- Morse Institute Library VFD for chilled water pump
- Morse Institute Library Replacement of Liebert system serving Archive Room with a ductless mini-split
- Eliot School LED lighting retrofit

If approved by Green Communities, the Town will complete these projects in fall 2018. They are expected to reduce Natick's energy use by approximately 260,000 kilowatt-hours (kWh) and 2,700 therms of natural gas, which translates into an annual savings of \$43,000.

The Town also plans to pursue interior LED lighting retrofits at Police/Fire, Wilson Middle School, Bennett-Hemenway Elementary, Brown Elementary and Memorial Elementary via capital funds. These projects would result in an additional reduction of 278,000 kWh and an annual savings of \$47,000.

Natick typically learns the status of its Green Communities grant request in July of each year. This year our Green Communities regional coordinator has informed us that there is less money available and more candidates than ever before, but we are hopeful we have submitted a strong application. We will be sure to update you as soon as we have more information on this opportunity.

Thank you,

Jillian Wilson Martin



COMMONWEALTH OF MASSACHUSETTS EXECUTIVE OFFICE OF ENERGY AND ENVIRONMENTAL AFFAIRS **DEPARTMENT OF ENERGY RESOURCES** 100 CAMBRIDGE ST., SUITE 1020 BOSTON, MA 02114 Telephone: 617-626-7300 Facsimile: 617-727-0030

Charles D. Baker Governor

Karyn E. Polito Lt. Governor Matthew A. Beaton Secretary

Judith F. Judson Commissioner

July 19, 2018

Melissa Malone, Town Administrator Town of Natick 13 East Central Street Natick, MA 01760

Dear Town Administrator Malone:

I am pleased to inform you that the Department of Energy Resources (DOER) Green Communities Division has approved an award of \$245,142 for the following projects proposed in the Town of Natick's Green Communities Competitive Grant application.

List of projects funded:

- \$22,416, Eliot School— LED lighting
- \$26,788, DPW EM Garage— LED lighting
- \$26,983, DPW Administration— LED lighting
- \$64,578, Police Station—VFDs for rooftop units
- \$54,099, Fire Station- VFDs for rooftop units
- \$22,944, Morse Institute Library— VFDs for chilled water pump
- \$27,334, Morse Institute Library—Ductless mini-split replacement

The Division reviewed Natick's grant application and has determined these are viable projects that meet the eligibility requirements of our Competitive Grant program. Please note that, due to the competitive nature of this grant program, the use of these funds is restricted to the specifically-approved projects listed above.

Jane Pfister, Green Communities Grant Coordinator, will follow up with the contact listed in your competitive grant application to discuss next steps, including coordination of the grant contract process. The Green Communities Division looks forward to working with the Town of Natick on your grant projects. We congratulate you on your grant award, and applaud your efforts to create a cleaner energy future for your community and the Commonwealth as a whole.

Please do not hesitate to contact me at 617-626-7358 or by email at <u>Nicholas.Connors@Mass.gov</u> with any questions you may have regarding your grant award.

Sincerely,

Min > 

Nicholas Connors, Director Green Communities Division

Cc: Jonathan Freedman, Chair, Board of Selectmen Jillian Wilson Martin, Sustainability Coordinator Neal Duffy, Green Communities Regional Coordinator, Northeast



## Memorandum

To:	Board of Selectmen
CC:	Melissa A. Malone, Town Administrator
	William Chenard, Deputy Town Administrator, Operations
From:	Jillian Wilson Martin, Sustainability Coordinator
Date:	August 20, 2018
Subject:	Summary of DOER Grant Contracts

Per the Board's request, below please find a table summarizing the seven energy efficiency contracts we are requesting your approval on. The projects will be funded primarily by the Green Communities grant the Town was awarded in July, 2018, with the balance coming from capital funds that were appropriated by Town Meeting for the purposes described below.

Eliot School - LED Lighting Upgrade	Horizon Solutions	\$22,223	100% grant; utility incentives paid directly to contractor
DPW EM Garage - LED Lighting Upgrade*	Horizon Solutions	\$33,998	100% grant; utility incentives paid directly to contractor
DPW First Floor Offices - LED Lighting Upgrade	Horizon Solutions	\$28,814	100% grant; utility incentives paid directly to contractor
Police Station – VFDs for Rooftop Units	Hobart Energy	\$60,078	100% grant; utility incentives paid directly to contractor
Fire Station – VFDs for Rooftop Units	Hobart Energy	\$49,599	100% grant; utility incentives paid directly to contractor
Morse Institute Library – VFD for Chilled Water Pump*	Hobart Energy	\$39,444	58% (\$22,944) grant; 42% (\$16,500) capital; utility incentives paid directly to contractor
Morse Institute Library – Mini-split for Archive Room*	Hobart Energy	\$52,334	52% (\$27,344) grant; 48% (\$25,000) capital; utility incentives paid directly to contractor

\*Per my original memo, the net cost for asteriked projects is less than initially anticipated in Natick's Green Communities grant application. This is due to additional cost savings and higher utility incentives. In the past, when total project costs were lower than estimated, DOER has allowed Natick to retain the full amount funded by the grant and reduce the Town's contribution below what we committed in our application. The Funding Sources column presumes DOER will treat this year's projects the same way.

Please do not hesitate to contact me with any questions at jwmartin@natickma.org or 508-647-6555.

Building Name and/or Location	Project Name (description) [1, 7]	Projected Project Completion (month/year) (optional)	Projected Annual Electricity Savings or Generation (kWh)[2]	Projected Annual Natural Gas Savings (therms)[2]
Eliot	LED Lighting - Interior	Dec-18	21,188	
DPW (EM Garage)	LED Lighting - Interior	Dec-18	55,395	
DPW Administration*	LED Lighting - Interior	Dec-18	26,276	
Police	VFDs for Rooftop Units	Dec-18	52,217	1,609
Fire	VFDs for Rooftop Units	Dec-18	35,361	1,083
Morse Institute Library	VFD for Chilled Water Pump	Dec-18	22,046	
Morse Institute Library	Liebert Replacement with Ductless Mini-Split	Dec-18	52,294	
NA	ГІСК	N/A	264,777	2,692

NOTE: This table has been formatted so that the projects are directly transferable to/from Table 4 of the E

A municipality may submit proposals for as many projects as it wishes. Projects must comply with all re
 Please estimate only the projected direct annual cost and energy savings.

[3] For other fuels, please specify in column header fuel and units (ex: gallons). DOER will perform the calcu[4] Total project cost = sum of all funding sources (columns J-M)

[5] Please note that the total grant request does not need to equal your total grant allocation at this time. the cost of that study. A subsequent request should be made to pay for the measures/buildings audited or *Green Communities Grant funding*.)

[6]Please provide a specific page number/range from the audit or study that provides funding request and [7] Proposed projects should be completed within approximately one year from contract execution.

Projected Annual Oil Savings (gallons)[2]	Projected Annual Energy Savings (other fuel) [2,3]	Projected Annual Cost Savings[2] (\$)	Total Project Cost (\$) [4]	GC Grant Funding (\$) [5]	Utility Incentives (\$)
		\$3,601.88	\$27,472.21	\$22,416.21	\$5,056.00
		\$9,417.00	\$41,067.63	\$26,787.63	\$6,780.00
		\$4.467.00	¢25,202,27	¢26,092,27	É8 400 00
		\$4,467.00	\$35,383.27	\$26,983.27	\$8,400.00
		\$9,000.00	\$69,978.00	\$64,578.00	\$5,400.00
		\$6,088.00	\$58,499.00	\$54,099.00	\$4,400.00
		\$3,086.00	\$44,344.00	\$22,944.00	\$1,400.00
		\$7,321.00	\$59,024.00	\$27,334.00	\$1,690.00
0	0	\$42,980.88	\$335,768.11	\$245,142.11	\$33,126.00

nergy Reduction Plan and Annual Reports in order to minimize the reporting burden of Green Commu

quirements specified in the full guidance document.

ulations for MMBtu and GHGs.

For example, if an audit or engineering study needs to be performed, then this request should be for studied. (*Please note: Only audits that are at a minimum an ASHRAE Level 2 audit will be eligible for* 

project details.

Other Grants (please list source in column N) (\$)	Town Contribution (\$)	Funding Source(s) for Other Grants and Town Contribution	Audit or Study Reference	Audit or Study Page Reference(s) [6]
			Horizon Eliot Lighting	
	\$7,500.00	Capital	Proposal Horizon DPW Equipment Maintenance Garage Proposal	
			Horizon DPW Offices Proposal	
			B2Q Police RTU Proposal	
			B2Q Fire RTU Proposal	
	\$20,000.00	Capital	B2Q MIL CHW Proposal	
	\$30,000.00	Capital	B2Q MIL Archive Proposal	
\$0.00	\$57,500.00	N/A	N/A	N/A
nities.				

Other Supporting Document(s) and Page References [6]	Part of Performance Contract? (yes or no)
	no
	no
	no
	no
	no
	no
Peregrine Report 2014 (p.3-4), Peregrine Report 2017 (p.1-4)	no
	110
N/A	N/A

This Agreement is made this \_\_\_\_\_day of \_\_\_\_\_, 2018, by and between the Town of Natick with an address of Natick Town Hall, 13 East Central Street, Natick, MA 01760, by the Natick Board of Selectmen (hereinafter the "Town," or the "Client"), and Horizon Solutions, LLC, a limited liability corporation with a principal place of business at 175 Josons Drive, Rochester, New York 14623 (hereinafter the "Contractor" or "Horizon").

The words "he," "him" and "his" in this Agreement, as far as they refer to the Contractor, shall so refer whether the Contractor is an individual, partnership or corporation. All prior contracts, if any exist between the Town and the Contractor, are hereby terminated and shall be of no force and effect.

1. Scope of Services and Scheduling

In consideration of the obligations herein contained, Horizon shall perform the work included in the scope of work in the Horizon proposal dated January 23, 2017 (the "Project"), which is attached hereto and incorporated herein by reference. All materials shall be new and shall meet UL, Federal, State and Local code requirements. Any material change to the scope of work, including acceptance of the additional cost for the work, shall be agreed upon by both parties in writing before the work is performed. The work will be considered complete, with the exception of any minor open items, after the Client and Utility representative review and approval of the work (herein referred to as the "certificate of completion").

Horizon provides this proposal based on Prevailing wage requirements, if applicable, and all work performed during normal work week (7:00 A.M. to 3:30 P.M. local time), unless otherwise stated in the proposal.

Horizon shall install the Project with regard for the appearance and condition of the Client's property. Waste material shall be removed daily.

The Client will cooperate and coordinate with Horizon on scheduling and maximize productivity on Energy Conservation projects. The Client will allow Horizon access to areas of the building to ensure rapid, efficient installation and completion of the Project.

2. Standard of Care

The Contractor's services shall be performed as expeditiously as is consistent with professional skill and care and the orderly progress of the work. The Contractor shall exercise due care and diligence in the rendition of all services under this Agreement in accordance with the applicable professional standards in the eastern Massachusetts area. The Contractor's services shall be performed as expeditiously as is consistent with such standards.

3. Term

The term of this Agreement shall be for one (1) year, commencing as of the execution date of this Agreement, and ending one (1) year later.

4. Order of Priority of Agreement Documents

In the event of any conflict among the Agreement Documents, the Documents shall be construed according to the following priorities:

Highest Priority:	Amendments to Agreement (if any)
Second Priority:	Agreement

#### 5. Payment

In consideration for performance of the work in accordance with the requirements of this Agreement, the Client shall pay Horizon the prices set forth in Exhibit A, which is attached hereto and incorporated by reference.

This Agreement is a fixed price/fixed rate contract; and, therefore, miscellaneous expenditures associated with Horizon's work on the Project shall not be paid by the Client. In the event that an unforeseen miscellaneous expense is incurred, Horizon shall receive the Client's approval in writing prior to incurring the expense if it will subsequently seek payment of said expense from the Client.

Payment shall be made to Horizon for work completed in accordance with this Agreement. All requests for payment shall be submitted to the Client as an invoice and shall specify work completed, progress made toward completing deliverables, the number of hours worked, the classification of each employee who performed work, and the billing rate for each employee who performed work on the Project.

Payment will be due thirty (30) days after receipt of Horizon's invoice by the Client for services rendered in accordance with this Agreement. The Client shall not make payments in advance.

If the Client objects to all or part of any invoice, the Client shall notify the Horizon in writing within two (2) weeks of the date of receipt of the invoice, and shall pay that portion of the invoice not in dispute within thirty (30) days after the date of receipt of the invoice.

Should it be necessary for Horizon to engage the services of a specialized contractor or companies other than those originally proposed in Horizon's proposal, Horizon shall take such measures only with the Client's prior written approval. Charges for such services shall be billed directly to the Client unless otherwise agreed upon by the parties.

Payment of the amounts due under this Agreement shall release the Town of Natick and its officers, employees, boards, commissions, committees, agents and representatives, from any and all claims and liability in any way relating to this Agreement or anything done in pursuance thereof.

No payment by the Client to Horizon shall be deemed to be a waiver of any right of the Client under this Agreement or a ratification by the Client of any breach hereof by Horizon.

6. Warranty

It is understood and agreed that Horizon will perform all services hereunder in a professional manner with appropriately skilled employees or subcontractors. Horizon warrantees the workmanship for one (1) year from the date of the certificate of completion and shall assign all applicable Manufacturers' warranties for products used on the Project to the Client. Horizon shall also assist in completing all applicable warrantee registration forms and explain the warrantee process for these Manufacturer warranties.

#### 7. Compliance with Laws

Horizon shall comply with all provisions of Federal, Massachusetts and Town of Natick law applicable to his work including, without limitation, statutes, by-laws, rules, regulations, orders and directives, as amended, and including, without limitation, the Williams-Steiger Occupational Safety and Health Act, as amended, and related regulations, as amended, in effect throughout the term of

this Agreement and any extension or renewal thereof. Without limitation, Horizon shall comply with the provisions of Chapter 149, Section 26 to 27D of the Massachusetts General Laws, as amended, and the applicable minimum wage rates as determined by the Massachusetts Commissioner of Labor and Industries. This Agreement shall be considered to include in their entirety all terms respecting workers' compensation insurance and other terms required to be included in it by Chapter 152 of the Massachusetts General Laws, as amended, as though such terms were set forth in their entirety herein.

8. Insurance

Horizon shall insure and shall require each of its subcontractors to carry the following insurance to the extent stated:

- a. Workers' Compensation Insurance as required by the laws of the Commonwealth of Massachusetts and employer's liability insurance in the amount of \$1,000,000/\$1,000,000.
- b. Commercial General Liability Insurance, \$1,000,000 each occurrence and \$2,000,000 aggregate limit. Commercial General Liability insurance shall include personal injury liability, broad form property damage liability, products/completed operations liability and broad form contractual liability.
- c. Automobile Liability Insurance, covering all non-owned and hired vehicles Combined single limit of \$1,000,000.
- d. Professional Liability Insurance, covering errors and omissions, \$1,000,000 each occurrence and \$2,000,000 aggregate limit.
- e. Excess Liability Insurance, Umbrella Form \$1,000,000 each occurrence and \$2,000,000 aggregate, which shall be following form, providing coverage over commercial general liability insurance and employer's liability under workers' compensation insurance.
- f. The Town of Natick shall be named as additional insured on each such policy of Commercial General Liability Insurance and, if required, Automobile Liability Insurance.
- g. All certificates and policies shall contain the following provision:

"Notwithstanding any other provision herein, should any of the above policies be cancelled or materially amended before the expiration date thereof, the issuing company will mail thirty (30) days prior written notice thereof to the named certificate holder and to the Natick Town Administrator, Natick Town Hall, 13 East Central Street, Natick, MA 01760, before such cancellation or amendment shall take place."

- h. Certificates evidencing such insurance in five (5) copies shall be furnished to the Client at the execution of this Agreement. Such certificates shall not merely name the types of policy provided, but shall specifically refer to this Agreement and shall state that such insurance is as required by this Agreement. Horizon shall make no claims against the Town of Natick or its officers for any injury to any of its officers or employees or for damage to its equipment arising out of work contemplated by the Agreement.
- i. Horizon shall also be required to provide to the Town of Natick with its proof of insurance

coverage endorsements or riders to the policies of commercial general liability insurance and, if required, automobile liability insurance, which indicate that the Town of Natick are named as additional insureds on each such policy.

- j. No insurance shall be obtained from an insurer which:
  - 1. is not licensed to sell insurance in the Commonwealth of Massachusetts; or

2. is not authorized to provide insurance as an excess or surplus lines insurer, and does not have a current Best's rating of A or better.

k. Failure to provide and continue in force such insurance as aforesaid shall be deemed a material breach of this Agreement and shall operate as an immediate termination thereof.

#### 9. Indemnification

Horizon shall compensate the Client for all damage to the Client's property of any nature arising out of Horizon's work. To the fullest extent permitted by law, Horizon shall indemnify, defend, and hold harmless the Town of Natick and all of its officers, employees, boards, commissions, committees, agents and representatives from and against all claims, causes of action, suits, costs, damages, and liability of any kind which arise out of the breach by Horizon of its obligations under this Agreement, or the act or omission of Horizon, its subcontractors, or their officers, employees, agents and representatives or anyone directly or indirectly employed by them, or anyone for whose acts or omissions they may be liable, regarding the work to be performed by Horizon under the Agreement, or which arise out of the violation of any federal, Massachusetts or Town of Natick statute, by-law, rule, regulation, order or directive, or which relate to personal injury or property damage suffered by Horizon or any of its officers or employees regarding the subject matter of this Agreement. Said costs shall include, without limitation, legal costs, collections fees, and counsel fees incurred in defending any claim or suit that may be brought against the Client and any judgment that may be obtained in any such claim or suit.

#### 10. No Personal Liability

Neither the Town of Natick, nor its officers, employees, boards, committees, commissions, agents and representatives shall be under any personal obligation or incur any personal liability by reason of this Agreement, the execution thereof or anything relating thereto which arises out of the breach or violation of any provision of this Agreement, or the violation of any Federal, Massachusetts or Town of Natick statute, by-law, rule, regulation, order or directive, or which relates to personal injury or property damage suffered by Horizon or its employees, regarding the subject matter of this Agreement.

#### 11. Familiarity with Area of Work

By signing this Agreement, Horizon acknowledges that it has examined the subject matter of this Agreement, including, without limitation, the provision of energy consulting services, and that it is familiar with all sites which are the subject of this Agreement in the Town of Natick and with all conditions of this Agreement. Horizon has entered into this Agreement in reliance on its own examinations and estimates as to the amount and character of its work, and conditions which may be encountered in the performance thereof, and shall assume all risks and bear all losses pertaining thereto.

The nature of Horizon's work includes the installation of energy efficiency equipment and solutions. Horizon does not take responsibility for the following existing conditions at the Project site: existing code violations, structural issues, deteriorating wiring and hazardous material, such as asbestos, lead paint, and oil. To the extent that Horizon and/or its officers, employees, agents, subcontractors or consultants do not cause the presence of hazardous material at the Project site, Horizon and its officers, employees, agents, subcontractors and consultants shall have no responsibility for the discovery, presence, handling, removal or disposal of, or exposure of persons to, hazardous material in any form at the Project site. If Horizon discovers hazardous material at the Project site, it shall immediately notify the Client in writing and shall refrain from disturbing or taking any action with respect to the hazardous material in the absence of the Client's written direction. In the event Horizon does disturb such hazardous material or does take such action without written direction, the limitation of liability in this paragraph shall not apply.

12. Performance Bond

DELETED – NOT APPLICABLE.

13. Labor and Materials Payment Bond\_

DELETED – NOT APPLICABLE.

14. Independent Contractor Status

Horizon shall provide services under this Agreement as an independent contractor with the Town of Natick and not as an employee of the Town. No employee, agent or representative of Horizon shall be entitled to receive any benefits of employment with the Town of Natick, including without limitation salary, overtime, vacation pay, holiday pay, sick leave, health insurance, life insurance, pension or deferred compensation.

15. Use of Alcohol and Controlled Substances Prohibited

Horizon hereby acknowledges that the use of alcoholic beverages, narcotics, and mood altering substances, except for current valid, legal prescriptions, by any officer, employee, agent, or representative of Horizon is prohibited on Town property which is the subject matter of this Agreement and during all hours of work under this Agreement. If any officer, employee, agent, or representative of Horizon violates the foregoing provision, the Client shall have the right to order that such officer, employee, agent, or representative of Horizon shall not be permitted to return to work on this Agreement. Under such circumstances, Horizon shall promptly remove the subject officer, employee, agent, or representative from the job site and shall not permit the subject officer, employee, agent, or representative to perform further work in conjunction with this Agreement.

16. No Smoking

Pursuant to Massachusetts General Laws (M.G.L.) c. 270, §22, the Commonwealth of Massachusetts Smokefree Workplace Law, Horizon, its officers, employees, agents, and representatives shall refrain from smoking and from using tobacco products in any public building in the Town of Natick.

17. Criminal Background Screening

For each employee of Horizon who is performing services under this Agreement, Horizon shall, subject to its confidentiality and privacy obligations owing to its employees and third parties,

provide a written confirmation to the Client that such employee passed Horizon's pre-employment criminal background screen. In the event that any employee refuses to permit Horizon to provide such information to the Client, Horizon shall not assign such employee to perform services for the Client, and such employee shall not be authorized to perform services for the Client. The Client shall be permitted to keep such information in its files.

#### 18. Delays/Force Majeure

Except as specifically set forth in this Agreement, neither party shall hold the other responsible or liable for damages or delays in performance caused by acts of God, interruptions in the availability of labor, or other events beyond the control of the other party, or that could not have been reasonably foreseen or prevented. For this purpose, such acts or events shall include unusually severe weather affecting performance of services, floods, epidemics, wars, riots, strikes, lockouts, or other industrial disturbances, protest demonstrations, and project site conditions which could not have been reasonably anticipated. Should such acts or events occur, both parties shall use their best efforts to overcome the difficulties arising and to resume as soon as reasonably possible the normal pursuit of the services for the Project.

#### 19. Termination

- a. If Horizon shall breach any provision of this Agreement, which breach is not cured within twenty-one (21) days of written notice thereof from the Client to Horizon, the Client shall have the right to terminate this Agreement upon written notice to Horizon.
- b. If any assignment shall be made by Horizon or by any guarantor of Horizon for the benefit of creditors, or if a petition is filed by Horizon or by any guarantor of Horizon for adjudication as a bankrupt, or for reorganization or an arrangement under any provision of the Bankruptcy Act as then in force and effect, or if an involuntary petition under any of the provisions of the Bankruptcy Act is filed against Horizon and such involuntary petition is not discharged within ninety (90) days thereafter, in any event the Client may terminate this Agreement upon written notice to Horizon.
- c. The award of this Agreement and the continued operation of this Agreement are contingent upon appropriation by Natick Town Meeting of sufficient money to fund the Agreement. Should Natick Town Meeting fail to appropriate necessary funds therefore, the Client shall no longer be under any obligation to tender performance, including payment, under the terms of this Agreement. In that event, the Client may terminate this Agreement upon written notice to Horizon.
- d. The Client may terminate this Agreement upon written notice to Horizon if a source of money to fund the Agreement is lost during the Agreement term. In the alternative, the parties may agree in writing to amend the Agreement to provide for an Agreement price which represents a reduced appropriation for the Agreement term.
- e. The Client may also terminate this Agreement for convenience upon thirty (30) days' written notice to Horizon.

In the event of termination Horizon shall be entitled to be paid for services rendered in accordance with this Agreement prior to termination.

In the event that this Agreement is terminated pursuant to Section a. or b. above, the Client may make any reasonable purchase or contract to purchase services in substitution for services due from Horizon and may deduct the cost of any substitute contract, or damages sustained by the Client due to non-performance or non-conformance of services together with incidental and

consequential damages from the Agreement price, and shall withhold such damages from sums due or sums which become due.

#### 20. Notices

Except as otherwise provided in this Agreement all notices required or permitted to be given hereunder shall be in writing and shall be delivered by certified mail or registered mail, return receipt requested, to the parties at the following address or such other address or addresses as to which a party shall have notified the other party in accordance with this Section.

If to the Town of Natick:	Melissa A. Malone Town of Natick 13 East Central Street Natick, MA 01760
With copies to:	Karis North, Esq. Murphy, Hesse, Toomey & Lehane, LLP 300 Crown Colony Drive, Suite 410 Quincy, MA 02169
If to Horizon:	President Horizon Solutions LLC 175 Josons Drive Rochester, NeNY14623.

#### 21. Miscellaneous Provisions

- a. Any action at law or suit in equity instituted by Horizon as a result of the performance, nonperformance or alleged breach of this Agreement shall be filed in the Superior Court of the Commonwealth of Massachusetts for Middlesex County, MA, and in no other court or jurisdiction.
- b. No action or failure to act by either party shall constitute a waiver of a right or duty afforded to that party under the Agreement, nor shall such action or failure to act constitute approval of or acquiescence in a breach thereunder, except as may be specifically agreed in writing. No forbearance or indulgence in any form or manner by either party shall be construed as a waiver or in any way limit the legal or equitable remedies available to that party. No waiver by either party of any default or breach by the other party shall constitute a waiver of any subsequent default or breach.
- c. If Horizon discovers or is informed of any discrepancy or inconsistency in the Agreement Documents in relation to any law, statute, ordinance, by-law, decree, code, rule, regulation, or order, Horizon shall promptly, before commencing services under this Agreement, report the same to the Client in writing.
- d. Horizon acknowledges that it has not been influenced to enter into this Agreement, nor has Horizon relied upon any warranties or representations not set forth in this instrument.
- e. Horizon shall maintain the confidentiality of information designated by the Client as confidential, unless withholding such information would violate the law or create a risk of

significant harm to the public, or unless Horizon has been required to release such information by final judgment or order of a court of competent jurisdiction, or unless the Client has expressly waived such confidentiality in advance in writing.

- g. Horizon shall not represent or purport to represent that it speaks for the Client vis-à-vis the media or the public at-large without the Client's express, written consent in advance.
- h. Prior to commencing services under this Agreement, Horizon shall furnish the Client, in writing, the names, addresses and telephone numbers of not fewer than two (2) principal employees of his business who are to be contacted in the event of an after-hours emergency.
- i. By entering into this Agreement, Horizon certifies under penalties of perjury that its entry was made and submitted in good faith and without collusion or fraud with any person. As used in this certification, the word "person" shall mean any natural person, business, partnership, corporation, union, committee, club, or other organization, entity, or group of individuals.
- j. By entering into this Agreement, Horizon certifies under the penalties of perjury, pursuant to M.G.L. c.62C, Section 49A(b), that it has complied with all laws of the Commonwealth relating to taxes, to reporting of employees and contractors, and to withholding and remitting child support.
- k. Prevailing wage rates, as contained in the Bid documents, shall be paid, pursuant to M.G.L. c.149, §§26-27G, if they are applicable.
- 1. Horizon understands that the Massachusetts Conflict of Interest Law, Chapter 268A of the Massachusetts General Laws, applies to Horizon with respect to the services required to be provided under this Agreement. Horizon and its officers, employees, agents, subcontractors and affiliated agencies shall not participate in any activity which constitutes a violation of the Massachusetts Conflict of Interest Law or which creates an appearance of a violation of the Massachusetts Conflict of Interest Law.
- m. Horizon shall not discriminate against or exclude any person from participation herein on grounds of race, color, religious creed, national origin, sex, gender identity, sexual orientation (which shall not include persons whose sexual orientation involves minor children as the sex object), age, genetic information, ancestry, children, marital status, veteran status or membership in the armed services, the receiving of public assistance, and handicap. The previous sentence shall include, but not be limited to, the following: advertising, recruitment; hiring; rates of pay or other forms of compensation; terms; conditions or privileges of employment; employment upgrading; transfer; demotion; layoff; and termination. Horizon shall take affirmative actions to insure that applicants are employed, and that employees are treated during their employment, without regard to race, color, religious creed, national origin, sex, gender identity, sexual orientation (which shall not include persons whose sexual orientation involves minor children as the sex object), age, genetic information, ancestry, children, marital status, veteran status or membership in the armed services, the receiving of public assistance, and handicap.
- n. To the extent that any of the foregoing sections required by Massachusetts law are inconsistent with other, non-statutory sections in this Agreement, any statutorily-mandated provisions contained herein shall control.
- o. Horizon shall not assign or subcontract in whole or in part this Agreement or in any way

transfer any interest in this Agreement without the prior express written approval of the Client.

- p. This Agreement may be amended only by written consent of both parties.
- q. Horizon shall not assign any money due or to become due to Horizon unless the Client shall have received prior written notice of such assignment. No such assignment shall relieve Horizon of its obligations under this Agreement.
- r. If any provision, or portion thereof, of this Agreement shall be adjudged to be invalid or unenforceable by final judgment or order of a court of competent jurisdiction, the remaining provisions of the Agreement shall continue in effect to the extent permitted by law.
- s. The provisions of this Agreement shall be binding upon and inure to the benefit of the heirs, assigns and successors in interest of the parties.
- t. This Agreement shall be governed by and construed in accordance with the laws of the Commonwealth of Massachusetts, regardless of choice of law issues or principles.
- u. This Agreement is executed in triplicate as a sealed instrument.

(The remainder of this page is left intentionally blank.)

The Town of Natick, Massachusetts	Horizon Solutions, LLC
By: The Natick Board of Selectmen	By:
Amy K. Mistrot, Chair	Signature
Susan G. Salamoff, Vice Chair	Printed Name
Michael J. Hickey, Jr., Clerk	Printed Title
Jonathan Freedman	
Richard P. Jennett, Jr.	
Dated:	Dated:

## APPROVED AS TO AVAILABILITY OF APPROPRIATION:

In accordance with the requirements of M.G.L. Chapter 44, Section 31C, this is to certify that an appropriation in the amount of this Agreement is available therefor, and that the Natick Board of Selectmen is authorized to execute this Agreement and to approve all requisitions and execute change orders.

Arti P. Mehta Comptroller, Town of Natick Dated:

APPROVED AS TO FORM ONLY, AND NOT AS TO SUBSTANCE:

Karis North, Esq.	

## CERTIFICATE OF VOTE

I,(Clerl	k/Secretary)		, hereby certify		
that I am the duly	y qualified and acting	(Title)	(Corporation Nar	_of ne)	
	ify that at a meeting of th h meeting all Directors w		1 2		
VOTED: To aut	horize and empower eithe	er		,	
(Name)	(Title)	· or			
(Name)		_, 01			
(Name)	(Title),	_			
any o	ne acting singly, to execu	ite all contracts an	d bonds on behalf of t	the Corporation.	
•	that the above vote is still		he day of	, 20	_ and has

not been changed or modified in any respect.

Signature

Printed Name

Printed Title

The certification contained hereabove shall be executed by CONTRACTOR or copy of current "certification of authority to sign for the Corporation" shall be attached.)

#### **Exhibit A: Project Cost and Payment Terms**

Company Name:	Town of Natick
<b>Billing Address:</b>	13 East Central Street, Natick Town Hall, Natick, MA 01760

#### Purchase Order/Contract #:

<b>Project Cost:</b> Labor, Material, Disposal Costs Sales Tax on Material Total Project Cost	\$27,472.21 N/A \$27,472.21
Less: *Estimated Project IncentivesUtilityApp #EversourceNR180404	\$5,249.00
Total Incentives Net Project Cost to Client	\$5,249.00 <b>\$22,223.21</b>

Note:

## **Project Payment Terms:**

Amount to be paid by the Client to Contractor (Payable 30 days after invoice date))	\$22,223.21
Amount to be paid by Utilities to Contractor (Contractor will collect this amount directly from th	\$5,249.00 e Utilities)
Total Project Cost	<u>\$27,472.21</u>

The final invoice date will be determined by the "Certificate of Completion" as described in the Terms & Conditions.



# Energy Efficiency Proposal Town of Natick – Eliot Lighting Rev 1



Prepared by

Tony Parente & Brandon Tibbitts Horizon Energy Services LLC 3/9/2018

401 265 1284

HES - Executive Summary	
EVERS URCE ENERGY HORIZON SOLUTIONS	Energy STAR
Overall System Investment:	
Total Project Investment:	\$27,472.21
	· ·
Total Cost Investment: Project Incentives: (Electric)	\$27,472.21 <u>\$5,056.00</u>
Total Net Cost Investment:	\$22,416.21

Pricing guaranteed for 45 days from date of proposal

Value Analysis:	
Annual Energy Savings: Monthly Energy Savings: Simple Payback Period (Years):	<b>\$3,601.88</b> <b>\$300.16</b> 6.22
Maintenance Savings	
*** Estimated Annual Maintenance Savings: Total Annual Operational Savings:	<b>\$295.35</b> \$3,897.23
* <b>Sales Tax is on Materials Only.</b> *** Maintenance Savings is Estimated and therefore is not used to calcula	te payback.



# **Town of Natick Energy Efficiency** Proposal Friday, March 09, 2018

Location:

5 Auburn Street

Natick MA

kWh Rate:

**Primary Contact:** 

Phone:

Jillian Wilson Martin (508) 647-6555

\$

### 0.17

Measure Description	KW Saved	KWH Saved	Estimated Savings \$	Project Cost \$	Project Elec Incentives	Project NET Cost \$	Estimated ROI
Lighting Upgrades	7.90	21,188	\$3,601.88	\$27,472.21	\$5,056.00	\$22,416.21	6.22
TOTALS	7.90	21,188	\$3,601.88	\$27,472.21	\$5,056.00	\$22,416.21	6.22

### **Measure Description**

Existing fixtures- the exisitng fixtures in the hallways and classrooms on main level are 2L 4ft and 4L 8ft wrap w/F32T8 that Horison proposes to replace with Sylvania TLED tube and driver kits. The basement level classrooms have 2L 2X2 w/FBO32T8 lamps that Horison proposes to replace with Lithonia 20w BLT LED fixtures with intergrated controls.

### **Next Steps**

Develop final project grade proposal for lighting. Confirm applicable EverSource.

Confirm owner project approval and execute contract documents

Preliminary estimate for budgeting purposes only

## **HES - Environmental Impact**

### **Town of Natick**

### **Environmental Impact**

Although it appears innocuous, lighting causes air pollution. Each day, your local power plant will commonly burn coal, oil, and gas to generate electricity for your lighting system as well as for your other electrical needs. While burning these fossil fuels produces a readily available and instantaneous supply of electricity, it also generates air pollutants: carbon dioxide (CO2), sulfur dioxide (SO2), and nitrogen oxides (NOx).

### Air pollution causes global warming, acid rain, and smog.

Each of these pollutants causes environmental damage. Carbon dioxide (CO2) causes global warming, sulfur dioxide (SO2) causes acid rain, and nitrogen oxides (NOx) cause both acid rain and smog.

# Your project will help to decrease air pollution and environmental damage by the following amounts each year:

UNITED STATES	Removing	19,069	pounds of Carbon Dioxide*
AGENCY AGENCY	Removing	52,969	grams of Sulfur Dioxide
THUTAL PROTECTION	Removing	122,888	grams of Nitrogen Oxides

# By removing these quantities of pollutants from the air, your project will have the same affect on the environment as:

Planting	5	acres of trees
Removing	3	cars from the road each year or
Saving	1,926	gallons of gasoline each year

Source: U.S. Environmental Protection Agency

http://www.epa.gov/climatechange/

\*Carbon Dioxide calculation has been modified from EPA calculation to properly reflect the New England power grid

## **HES - Savings Projections (Lighting)**

wn of Natick

		Existing (	Conditions		
Total #		Pre Annual	Pre	Pre Annual	Total Lighting
of Fixtures/Actions	Pre KW	Demand Charge	Annual KWH	KWH Charge	Cost \$\$
132	11.99	\$0.00	30,315	\$5,153.53	\$5,153.53

		Proposed	l Lighting		
Total #		Post Annual	Post	Post Annual	Total Lighting
of Fixtures/Actions	Post KW	Demand Charge	Annual Kwh	KWH Charge	Cost \$\$
132	4.09	\$0.00	9,127	\$1,551.65	\$1,551.65

Demand Savings				
KW Demand	Monthly	Annual		
Savings	Cost Savings	Cost Savings		
7.90	\$0.00	\$0.00		

	KWH Savings	
Annual KWH	Monthly	Annual
Savings	Cost Savings	Cost Savings
21,188	\$300.16	\$3,601.88

Total Cost Savings	
Monthly Annual	
Cost Savings Cost Savings	

Calculated Electric Rate					
Avg KWh. Cost	\$0.1700				
Demand Cost	\$0.000				

\$300.16 \$3,601.88

69.89% Reduction in total lighting cost

#### Town of Natick

Lighting Worksheet Auditor: Brandon Tibbetts

SITE LOCATION	Fir	EXISTING	PRODUCT CODE	QTY	E-Watts	Total KW	RUN HRS	kWh Pre	ANNUAL COST \$0.170	PROPOSED	QTY	Sensor Type	QTY	DEVICE CODE	P-watts	Prop RunHRS	TOT KW	kWh Post	Total Post-KWH	ANNUAL COST (PROPOSED)	Annua CostSvi
SITE LOCATION			E-Code							PROPOSED	QTY			P-code							
Bookroom	1st	1L Pendant w/23wCFL	1C0023E	1	25	0.03	2340	59	\$9.95	RL/LED9A19F841	1	0	0	1L009	q	2,340	0.01	21	21	\$ 3.58	\$6
Classroom 2	1st	4L8ft wrap w/F32T8	4F32SSE	2	112		2340			RB/4L/4FT/LED/TUBE/60W	2	0	0	1L060							
			_	2	112	0.22		524	\$89.11			0	0		60	2,340	0.12	281	281	\$ 47.74	-
Classroom 2	1st	2L4ft wrap w/F32T8	2F32SSE	2	60	0.12	2340	281	\$47.74	RB/2L/4FT/LED/TUBE/30W	2	-	-	1L030	30	2,340	0.06	140	140	\$ 23.87	\$23
Classroom 3	1st	2L8ft wrap w/F32T8	2F32SSE	4	60	0.24	2340	562	\$95.47	RB/2L/4FT/LED/TUBE/30W	4	0	0	1L030	30	2,340	0.12	281	281	\$ 47.74	\$4
Classroom 1	1st	2L8ft wrap w/F32T8	2F32SSE	4	60	0.24	2340	562	\$95.47	RB/2L/4FT/LED/TUBE/30W	4	0	0	1L030	30	2,340	0.12	281	281	\$ 47.74	\$4
1st floor hallway	1st	2L4ft grated w/F32T8	2F32SSE	7	00	0.42	2860	1,201	\$204.20	RB/2L/4FT/LED/TUBE/30W	7	0	0	1L030	30	2.860	0.21	601	601	\$ 102.10	\$10
Boys RR	1st	1L Dome w/75w Inc	110075	3	75	0.23	2860	644	\$109.40	RL/LED9A19F841	3	0	0	1L009		2,860	0.03	77	77	\$ 13.13	
Girls RR	1st	1L Dome w/75w Inc	110075	3	/5		2860			RL/LED9A19F841	3	0	0	1L009	9						
				-	75	0.23		644	\$109.40		-	-			9	2,860	0.03	77	77	\$ 13.13	\$9
Stockroom	1st	1L Pendant w/75w Inc	110075	1	75	0.08	1040	78	\$13.26	RL/LED9A19F841	1	0	0	1L009	9	1,040	0.01	9	9	\$ 1.59	\$1
Entrance	1st	1L Pendant w/75w Inc	110075	8	75	0.60	2860	1,716	\$291.72	RL/LED9A19F841	8	0	0	1L009	9	2,860	0.07	206	206	\$ 35.01	\$25
Stairwell#1	0	1L Dome w/75w Inc	110075	1	75	0.08	2860	215	\$36.47	RL/LED9A19F841	1	0	0	1L009	9	2,860	0.01	26	26	\$ 4.38	\$3
Stairwell#1	0	4L 4ft wrap w/F32T8	4F32SSE	1	112	0.00	2860	320	\$54.45	RB/4L/4FT/LED/TUBE/60W	1	0	0	1L060	60	2,860	0.06	172	172	\$ 29.17	
Stairwell#1	0	2L 2ft wrap w/F17T8	2F17SSE	1	37	0.04	2860	106	\$17.99	RB/2L/2FT/LED/TUBE/16W	1	0	0	1L016	16	2,860	0.02	46	46	\$ 7.78	s St
Stairwell#1	0	1L 4ft wrap w/F32T8	1F32SSE	2	30	0.06	2860	172	\$29.17	RB/1L/4FT/LED/TUBE/15W	2	0	0	1L015	15	2,860	0.03	86	86	\$ 14.59	\$1
2nd floor hallway	2nd flr	2L4ft grated w/F32T8	2F32SSE	5	60	0.30	2860	858	\$145.86	RB/2L/4FT/LED/TUBE/30W	5	0	0	1L030	30	2,860	0.15	429	429	\$ 72.93	s s
Classroom 4	2nd flr	4L4ft wrap w/F32T8	4F32SSE	8	112	0.90	2340	2,097	\$356.43	RB/4L/4FT/LED/TUBE/60W	8	0	0	1L060	60	2,340	0.48	1,123	1,123	\$ 190.94	\$16
Girls RR	2nd flr	1L Dome w/75w Inc	110075	3	75	0.23	2860	644	\$109.40	RL/LED9A19F841	3	0	0	1L009	9	2,860	0.03	77	77	\$ 13.13	\$
Classroom 5	2nd flr	2L8ft wrap w/F32T8	2F32SSE	4	60	0.24	2340	562	\$95.47	RB/2L/4FT/LED/TUBE/30W	4	0	0	1L030	30	2,340	0.12	281	281	\$ 47.74	\$
Nurse	2nd flr	1L4ft wrap w/F32T8	1F32SSE	2	30	0.06	2340	140	\$23.87	RB/1L/4FT/LED/TUBE/15W	2	0	0	1L015	15	2,340	0.03	70	70	\$ 11.93	s s
Nurse RR	2nd flr	1L Pendant w/75w Inc	110075	1	75	0.08	1040	78	\$13.26	RL/LED9A19F841	1	0	0	1L009	9	1,040	0.01	9	9	\$ 1.59	\$1
Boys RR	2nd flr	1L Dome w/75w Inc	110075	3	75	0.23	2860	644	\$109.40	RL/LED9A19F841	3	0	0	1L009	9	2,860	0.03	77	77	\$ 13.13	\$9
Classroom 6	2nd flr	4L8ft industrial w/F32T8	4F32SSE	4	112	0.45	2340	1,048	\$178.21	RB/4L/4FT/LED/TUBE/60W	4	0	0	1L060	60	2,340	0.24	562	562	\$ 95.47	. si
Stairwell#2	0	4L 4ft wrap w/F32T8	4F32SSE	1	112	0.11	2860	320	\$54.45	RB/4L/4FT/LED/TUBE/60W	1	0	0	1L060	60	2,860	0.06	172	172	\$ 29.17	· \$
Stairwell#2	0	1L 4ft wrap w/F32T8	1F32SSE	1	30	0.03	2860	86	\$14.59	RB/1L/4FT/LED/TUBE/15W	1	0	0	1L015	15	2,860	0.02	43	43	\$ 7.29	
Gym	1st	1L 1X2 Arc w/250wMH	1M0250S	10	295	2.95	2340	6,903	\$1,173.51	NEW/LUSIO/4MS/LED/80W	10	0	0	1L080	80	1,638	0.80	1,310	1,310	\$ 222.77	\$9
Gym stage	1st	1L Pendant w/75w Inc	110075	2	75	0.15	1040	156	\$26.52	RL/LED9A19F841	2	0	0	1L009	9	1,040	0.02	19	19	\$ 3.18	\$
Gym storage	1st	1L Pendant w/23wCFL	1C0023E	1	25	0.03	1040	26	\$4.42	RL/LED9A19F841	1	0	0	1L009	9	1,040	0.01	9	9	\$ 1.59	
Storage corridor	1st	1L Pendant w/23wCFL	1C0023E	1	25	0.03	1040	26	\$4.42	RL/LED9A19F841	1	0	0	1L009	9	1,040	0.01	9	9	\$ 1.59	
Gym teacher	1st	1L Pendant w/23wCFL	1C0023E	1	25	0.03	1040	26	\$4.42	RL/LED9A19F841	1	0	0	1L009	9	1,040	0.01	9	9	\$ 1.59	
Basement stairs	BASE	2L4ft wrap w/F32T8	2F32SSE	2	60	0.12	2860	343	\$58.34	RB/2L/4FT/LED/TUBE/30W	2	0	0	1L030	30	2,860	0.06	172	172	\$ 29.17	· \$
Basement stairs	BASE	1L4ft wrap w/F32T8	1F32SSE	1	30	0.03	2860	86	\$14.59	RB/1L/4FT/LED/TUBE/15W	1	0	0	1L015	15	2,860	0.02	43	43	\$ 7.29	
Electrical closet	BASE	1L Pendant w/75w Inc	110075	1	75	0.08	520	39	\$6.63	RL/LED9A19F841	1	0	0	1L009	9	520	0.01	5	5	\$ 0.80	1
Basement hallway	BASE	2L8ft industrial w/F32T8	2F32SSE	1	60	0.06	2860	172	\$29.17	RB/2L/4FT/LED/TUBE/30W	1	0	0	1L030	30	2,860	0.03	86	86	\$ 14.59	\$
Basement hallway	BASE	2L 8ft strip w/F96T8	2F59SSE	3	109	0.33	2860	935	\$158.99	NEW/8FT/STRIP/LED/60W	3	0	0	1L060	60	2,860	0.18	515	515	\$ 87.52	
Tutor room	BASE	2L 2X2 Parabolic w/FBO32T8	2F32SSE	6	60	0.36	2340	842	\$143.21	NEW/2X2/LED/20W/BLT	6	0	0	1L020	20	1,638	0.12	197	197	\$ 33.42	\$1
Artroom	BASE	2L 2X2 Parabolic w/FBO32T8	2F32SSE	15	60	0.90	2340	2,106	\$358.02	NEW/2X2/LED/20W/BLT	15	0	0	1L020	20	1,638	0.30	491	491	\$ 83.54	- ·
Art room closet	BASE	1L Pendant w/75w Inc	110075	1	75	0.08	1040	78	\$13.26	RL/LED9A19F841	1	0	0	1L009	9	1,040	0.01	9	9	\$ 1.59	
Art room closet	BASE	2L4ft wrap w/F32T8	2F32SSE	1	60	0.06	1040	62	\$10.61	RB/2L/4FT/LED/TUBE/30W	1	0	0	1L030	30	1,040	0.03	31	31	\$ 5.30	-
Kitchen	BASE	2L 2X2 Parabolic w/FBO32T8	2F32SSE	6	60	0.36	2860	1,030	\$175.03	NEW/2X2/LED/20W/BLT	6	0	0	1L020	20	2,002	0.12	240	240	\$ 40.84	-
Boiler room	BASE	4L8ft wrap w/F32T8	4F32SSE	2	112	0.22	1040	233	\$39.60	RB/4L/4FT/LED/TUBE/60W	2	0	0	1L060	60	1,040	0.12	125	125	\$ 21.22	
Boiler room	BASE	2L4ft wrap w/F32T8	2F32SSE	2	60	0.12	1040	125	\$21.22	RB/2L/4FT/LED/TUBE/30W	2	0	0	1L030	30	1,040	0.06	62	62	\$ 10.61	
Frontentrance	EXT	1L Pendant w/150w Inc	110150	1	150	0.15	4380	657	\$111.69	RL/LED/HIDR/1500/840	1	0	0	1L015	15	4,380	0.02	66	66	\$ 11.17	-
Front Bldg	EXT	1L flood w/250w Halogen	1T0250	1	250	0.25	4380	1,095	\$186.15	NEW/RAB/FFLED18/PC	1	0	0	1L022	22	4,380	0.02	96	96	\$ 16.38	- ·
Back of Bldg	EXT	1L wallpack w/250w MH	1M0250S	1	295	0.30	4380	1,292	\$219.66	NEW/SYL/LED/WP/75W/PC	1	0	0	1L075	75	4,380	0.08	329	329	\$ 55.85	-
Side door	EXT	1L wallpack w/100w MH	1M0100S	1 132	120	0.12	4380	526 30,315	\$89.35 \$5.153.53	NEW/SYL/LED/WP/36W/PC	1	0	0	1L036	36	4,380	0.04	158 9,127	158 9,127	\$ 26.81 \$ 1,551.65	\$3,

- 23
- 24 25

Annual Savings:	\$ 3,601.88
kW Reduced:	7.90



### FEATURES & SPECIFICATIONS

**INTENDED USE** — The BLT Best-in-Value Low Profile LED luminaire features a popular center basket design that offers a clean, versatile style andvolumetric distribution. High efficacy LED light engines deliver energy savings and lowmaintenance compared to traditional sources. Anextensive selection of configurations and options make the BLT the perfect choice for many lighting applications including schools, offices and other commercial spaces, retail, hospitals and healthcare facilities. The low profile BLT design (2-3/8") also makes it an excellent choice for renovation projects.

**CONSTRUCTION** — BLT enclosure components are die-formed for dimensional consistency and painted after fabrication with a polyester powder paint for improved performance and protection.

The reflector is finished with a high reflective matter white powder paint for improved aesthetics and increased light diffusion.

End plates contain easy-to-position integral T-bar clips for securely attaching the luminaire to the T-grid. For additional T-grid security, optional screw on T-bar clips are available.

Diffusers are extruded from impact modified acrylic for increased durability. Injection molded diffuser light traps add a finished look to the diffuser ends and help seal the diffuser to the housing end plates. Optional diffuser trim rings provide an attractive mounting for integral sensors as well as adding a decorative element to the fuminaire aesthetics.

LED boards are accessible from below; driver is accessible from the plenum.

**OPTICS** — Volumetric illumination is achieved by creating an optimal mix of light to walls, partitions and vertical and horizontal work surfaces — rendering the interior space, objects and occupants in a more balanced, complimentary luminous environment. High performance extruded acrylic diffusers conceal LEDs and efficiently deliver light in a volumetric distribution. Four diffuser, choices available - curved and square designs with linear prisms or a smooth frosted finish.

**ELECTRICAL** — Long-life LEDs, coupled with high-efficiency drivers, provide superior quantity and quality of illumination for extended service life. 70% LED lumen maintenance at 60,000 hours (L70/60,000).

**Non-Configurable BLT:** 0-10 volt dimming driver. Dims to 10%

**Configurable BLT:** available in High Efficiency (HE) versions for applications where a lower wattage (over the standard product) is required. The High Efficiency versions deliver >130 LPW and can be specified via the Lumen Package designations in the Ordering Information below.

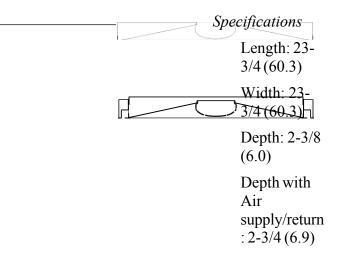
eldoLED driver options deliver choice of dimming range, and choices for control, while assuring flickerfree, low-current inrush, 89% efficiency and low EMI.

Optional integrated nLight®controls make each luminaire addressable - allowing it to digitally communicate with other nLight enabled controls such as dimmers, switches, occupancy sensors and photocontrols. Connection to nLight is simple. It can be accomplished with integrated nLight AIR wireless or through standard Cat-5 cabling. nLight offers unique

plug-and-play convenience as devices and luminaires automatically discover each other and self-commission, while nLight AIR is commissioned easily through an intuitive model app.

Lumen Management: Unique lumenmanagementsystem (option N80) provides on board intelligence that actively manages the LED light source so that constant lumen output is maintained over the system life, preventing the energy waste created by the traditional practice of over-lighting.





inches (centimeters) unless otherwise specified.

Catalog Num ber
Notes
Туре

Multiple Diffuser Options

BLT Series LED

2'x2' LED

 $2\mathbf{R}$ 



Driver disconnect provided where required to comply with US and Canadian codes.

SENSOR— Integrated sensor (individual control): Sensor Switch MSD7ADCX ((Passive infrared (PIR)) or MSDPDT7ADCX ((PIR/Microphonics) Dual Tech (PDT)) integrated occupancy sensor/automatic dimming photocell allows the luminaire to power off when the space is unoccupied or enough ambient light is entering the space. See page 4 for more details on the integrated sensor.

Integrated Sensor (nLight Wired Networking): This sensor is nLight-enabled, meaning it has the ability to communicate over an nLight network. When wired, using CAT-5 cabling, with other nLight-enabled sensors, power packs, or WallPods, an nLight control zone is created. Once linked to a Gateway, directly or via a Bridge, the zone becomes capable of remote status monitoring and control via Sensor View software. See page 4 for the nLight sensor options.

**Integrated Smart Sensor (nLight Air Wireless Platform):** The rES7 sensor is nLight Air wireless meaning it has the ability to communicate over the wireless nLight control platform. It is both a digital PIR occupancy sensor/automatic dimming photocell. It pairs to other luminaires and wall switches through our mobile app, CLAURITY, which allows for simple sensor adjustment. See page 4 for more details on the integrated Smart Sensor.

**INSTALLATION** — The BLT's low profile design of only 2-3/8." provides increased installation flexibility especially in restrictive plenum applications. The BLT fits into standard 15/16" and narrow 9/16" T-grid ceiling systems.

Suitable for damp location.

For recessed mounting in hard ceiling applications, Drywall Grid Adapters. (DGA) are available as an accessory. See Accessories section.

**LISTINGS** — CSA Certified to meet U.S. and Canadian rated.

DesignLights Consortium® (DLC) Premium qualified product. Not all versions of this product may be DLC Premium qualified. Please check the DLC Qualified Products List at w w w.designlights.org/QPL to confirm which versions are qualified.
WARRANTY — 5-year limited warranty. Complete warranty terms located at <u>www.acuit</u> ybrands.com/CustomerResources/Term

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<ul> <li>and tested to prov the-box control co • All configuration Brands'specifie</li> <li>This luminaire in control network shaded backgroup</li> <li>This luminaire in control network</li> <li>Startlardsminered</li> </ul>	spart of an A+ Certified solution for sport of an A+ Certified solution for sport of the selection includes dri tharked by a shaded background*	l out-of- ohing. e ty n Light® diby a r n Jight tionality iver and m
To learn more abo	bet A+, visit <u>www.acuitybrands.co</u> f	n <del>v</del> aplus.
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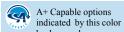
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at 25 °C. Specifications subject to change							
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25 °C. Specifications subject to change	
thout notice.	

Curved Ribbed

LED 2X2 2BLT-

Curved Smooth



### KKKKKUNG

### Lead times will vary depending on options

Example: 2BLT2 33L

2BLT2											
Series	Airfunction	Lumens₁		Diffuse	r	Voltage		Drive	r	Color temperature	
2BLT22X2 BLT	(blank) Static A Air supply/ return	effi         e           iency         i           (>100         (           LPW)         L           20L 2000         3           33L 3300         3           40L 4000         2	High effi iency2,3 >130 LPW) 33LHE 3300 40LHE 4000 48LHE 4800	prisms SDSM <b>Billing</b>	Curved,	(blan) 120 277 347	k)MVOLT 120 V 277V 347V₄	SLD LE 1	eldoLED dims to 1% (0-10 volt dimming) Step- level dimmin g <sub>5</sub> Lutron Ecosystem driver dims to 1% <sub>5.6</sub>	LP830 82CI 3000 K LP8 82CRI, 3500 LP840 82CI 4000 K LP8 82CRI, 5000 LP930 90CI 8P000, SOUCK	35 K RI, 50 K RI,

Controls	Occupancy control <sub>9</sub>		Options
(blank) No nLight® N80 nLight® with 80% lumen management N80EMG nLight® with 80% lumen management For use with generator supply EM power <sub>7</sub> N100 nLight® without lumen management N100EMG nLight® without lumen management For use with generator supply EM power <sub>7</sub> NLTAIR nLight AIR enabled₅	<ul> <li>(blank) No sensor control</li> <li>nLight Wired Networking</li> <li>NES7 nLight™ nES 7 PIR integral occupancy sensor₁₀</li> <li>NESPDT7 nLight™ nES PDT 7 dual</li> <li>technology integral occupancy control₁₀</li> <li>NES7ADCX nLight™ nES 7 ADCX PIR integral occupancy sensor with automatic dimming photocell₁₀</li> <li>NESPDT7ADCX nLight™ nES PDT 7 dual</li> <li>technology integral</li> </ul>	Individual Control MSD7ADCX PIR integral occupancy sensor with automatic dimming control photocell <sub>5,11</sub> MSDPDT7ADCX PDT integral occupancy sensor with automatic dimming control photocell <sub>5,11</sub> <b>nLight Wireless Zone</b> RES7Z nLight AIR PIR integral occupancy sensor with automatic gibtebidgilifical	EL7L       700 lumen battery pack <sub>12</sub> EL14L       1400 lumen battery pack <sub>12</sub> CP       Chicago plenum <sub>13</sub> BGTD       Bodine Generator Transfer         Device <sub>14</sub> PWS1836       6' pre-wire, 3/8" diameter, 18         gauge, 1 circuit       PWS1846       6' pre-wire, 3/8" diameter, 18         gauge, 2 circuit PWS1846 PWSLV       Two         cables: one 6' pre-wire, 3/8" diameter, 18 gauge, 2 circuits; one 6' pre-wire, 3/8" diameter, 18 gauge, 2 circuits; one 6' pre-wire, 3/8" diameter, 18 gauge, 1 circuit         PWS1856LV       6' pre-wire, 3/8" diameter, 18 gauge, 1 circuit         w/low voltage purple and grey wires <sub>15</sub> GLR       Fast-blowing fuse <sub>16</sub> GMF       Slow-blowing fuse <sub>16</sub> BHT PDS blog fulging baimbinaire <sub>17</sub>

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Non-Con	Non-Configurable BLT							
Stock/M1	Catalog	UPC	Lumen	Wattag	LPW	Color	Voltage	Pallet
O Stock	Description ADP	00889804471	9 <b>s</b> 3241	<b>e</b> 30	108	Tegypenatere	120-	Qty <sub>2</sub>
	28272 33L ADP	<b>00</b> 889804471	9 3313	30	111	4000K/82CR	1 720-	52
	2BLT2488LADP	<b>00</b> 889804620	0 3241	30	108	3500K/82CR	1 720-	52
	28142398ADP	<b>00</b> 889804620	0 3313	30	111	4000K/82CR	1 720-	52
MTO	2BLT2 33L ADP	00889804569	3241	30	108	3500K/82	347	52
	2BLT2 33L ADP	00889804569	3313	30	111	4000K/82CR	347	52

Accessories next page

\*0-10V Dimming to 10%.



2BL

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### Notes

- 1 Approximate lumen output.
- 2 All versions may not achieve 130+ LPW. Refer to
- photometry on <u>www.acuitybrands.com</u>.
- 3 High efficiency performance not available in AIR versions, 90 CRI or versions with integral sensor/trim rings.
- Not available with SLD driver, EL7L or EL14L battery packs.
   Not available with N80, N80EMG, N100, N100EMG,
- NLTAIR, or occupancy control. 6 Not available with controls, occupancy co
- Not available with controls, occupancy controls, or PWS options. Consult factory for Hi-Lume dimming.
   nLight EMG option requires a connection to existing
- 7 nLight EMG option requires a connection to existing nLight network. Power is provided from a separate N80 or N100 enabled fixture.
- 8 Must order with RES7N or RES7Z sensor. Only available with EZ1 driver.

- 9 Must specify diffuser with trim rings. See sensor options on page 4.
- 10 Requires N80, N80EMG, N100, or N100EMG.11 Only available with EZ1 driver option.0-10v
- dimming wires not accessible via access plate.When using pre-wire option, use PWS1846. or
- PWS1846 PWSLV. 13 Not available with N80, N80EMG, N100 or N100EMG.
- 14 Must specify voltage. Requires BSE labeling, voltage
- specific Consult factory for options.15 Not available with nLIGHT wired/wireless
- network or individual controls.
- 16 Must specify voltage, 120 or 277 with GLR & GMF fusing and BGTD.
- 17 For ordering logic consult: <u>RRL\_2013</u>.
- 18



Accessories: Order as separate

Urder as separate catalog atimber visit www.acuitybrands.com/products/controls/nlight.								
WallPod	Model	<b>Occupancy sensors</b> Small motion 360°,	Model number					
<b>Statioffs</b>	naodbat		nCM 9 RJB /					
On/Off &	hRDDM	Leilgegn BlRh dla (tech)	RCEM RERUB /					
<b>Caraphio</b> wer	DROD D	with sy fer with al	RANSERPOTEV					
Rhotocellen	<b>M6Ne</b> ]	Caste Sovabte (plenum	Mødebhumber					
Foultradige	number	tatedble	CAT5 10FT J1					
dimming	ADCX	30' cable	CAT5 30FT J1					

nLight® AIR Control Accessories: Order as separate catalog number. Visit www.acuitybrands.com/products/controls/nlightair.									
Wall switches	Model number								
On/Off single pole	rPODB [color]								
On/Off two pole	rPODB 2P								
[color] On/Off & raise/le	wer single pole								
	rPODB DX								
[color] On/Off&raise/lo	vertwopole								
NDX4vblor] On/Off & raise/low									
1 Can only be ordered with the	ES7Z zone control sensor version.								

Replacement Parts: Order as separate catalog number.

*237LJR 2DBLT24 ADP LENS	2 ft. replacement lens (light traps
A2557EKHBLY2DBLT24 SDP LENS	ጀባ <mark>ብ ሀር መ</mark> ረር መንግስ በ Ins (light traps
ASSFEMBLYDBLT24 ADSM LENS	ጀባዊ uteplacement lens (light traps
ASSFEMBLYDBLT24 SDSM LENS	ጀባዊ!uceplacement lens (light traps
ASSFEMBLYDBLT24 ADPT LENS	influces (trims included)
A257EMBLY2DBLT24 SDPT LENS	2 ft. replacement lens (trims included)
ASSFEMBLYDBLT24 ADSMT LENS	2 ft. replacement lens (trims included)
A2557EMBLY2DBLT24 SDSMT LENS	2 ft. replacement lens (trims included)
A2557EMBLY2DBLT24 ADPT SENSOR	2 ft. replacement lens (trims included)
LENTRASSEMBLIZ4 SDPT SENSOR	2 ft. replacement lens (trims included)
Ł₽₽₩₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽	2 ft. replacement lens (trims included)
LENTRIASSEMBLIZ4 SDSMT SENSOR	2 ft. replacement lens (trims included)
LENS ASSEMBLY	



Phone:

Fax:

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# 2BLT Volumetric Recessed Lighting 2'x2'

	Sensor Options											
Option	Automatic Dimming	Occupa Sensing		nLight Wired	nLight AIR	nLight AIR						
MSD7AD0	Photocell	X		Networki	Networki	Zone						
MSDPDT7A			Х									
DGNES7		X		Х								
NES7ADC	хх	Х		Х								
NESPDT	7		Х	Х								
NESPDT7A	. Х		Х	Х								
DOXES7N	Х	Х			Х							
RES7Z	Х	X				Х						

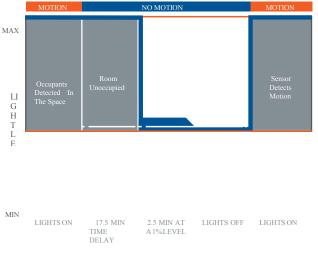
### **Basic nLight Zone**



### **Integrated Sensor with Individual Control**

The MSD7ADCX PIR occupancy sensor/automatic dimming photocell is ideal for areas without obstructions and where daylight harvesting may be desired. Suggested applications include, but not limited to, hallways, corridors, storage rooms, and breakrooms or other areas where people are typically moving.

The MSDPDT7ADCX PIR/Microphonics Dual Tech occupancy sensor/automatic, dimming photocell is ideal for areas with obstructions and where daylight harvesting is desired. Suggested applications include, but not limited to, open offices, private offices, classrooms, public restrooms, and conference rooms.



Sequence of Operation

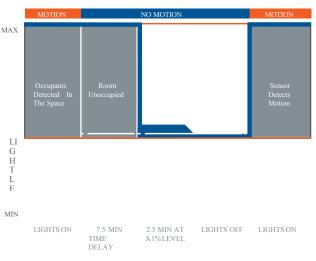
### \*The presetting on the automatic dimming photocell is 5fc.

### nLight Wired Networking

The nES 7 is ideal for small rooms without obstructions or areas with primarily walking motion. Ideal areas include hallways, corridors, storage rooms, and breakrooms.

Additionally, the NES7ADCX includes an integrated photocell, which enables daylight harvesting controls.

For areas like restrooms, private offices, open offices, conference rooms or any space with obstructions, the nES PDT 7 dual technology sensor is recommended. The nES PDT 7 utilizes both PIR (passive infrared) and Microphonics technologies to detect occupancy. Additionally, the NESPDT 7 ADCX includes an integrated photocell, which enables daylight 'harvesting controls which is ideal for areas where windows are present.



### Sequence of Operation

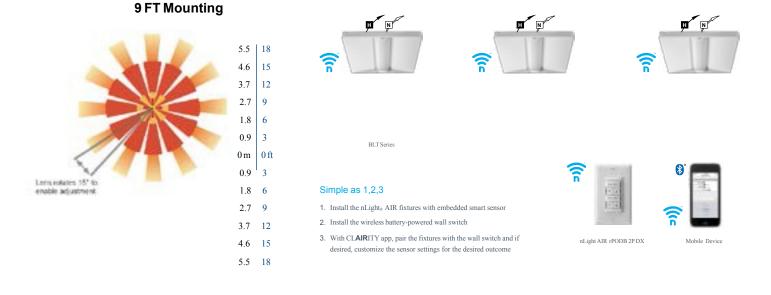
\*The presetting on the automatic dimming photocell is 5fc.

### 360° Lens

- Recommended for walking motion detection from mounting heights between 8 ft (2.44 m) and 20 ft (6.10 m)
- Initial detection of walking motion along sensor axes at distances of 2x the mounting height up to 15 ft (4.57 m) and
- 1.75x up to 20 ft (6.10 m).
- Provides 12 ft (3.66 m) radial detection of small motion when mounted at 9 ft (2.74 m)
- Initial detection will occur earlier when walking across sensor's field of view than when walking directly at sensor

### nLight AIR Wireless

nLight AIR is the ideal solution for retrofit or new construction spaces where adding additional wiring can be labor intensive and costly. The integrated rES 7 smart sensor is part of each luminaire in the nLight AIR network, which can be grouped to control multiple luminaires. The granularity of control with the digital PIR occupancy detection and daylight sensing makes a great solution for any application.



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An **Scuity**Brands Company

LED: One Lithonia Way Conyers, GA 30012 770-929-8789 www.lithonia.com Phone: 800-858-7763 Fax: © 2015-2016 Acuity Brands Lighting, Inc. All rights reserved. Rev. 10/06/16

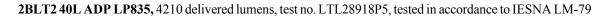
2BLT-2X2

# 2BLT Volumetric Recessed Lighting 2'x2'

# PHOTOMETRICS

2BLT2 33L ADP LP835, 3241 delivered lumens, test no. LTL28918P4, tested in accordance to IESNA LM-79

180°																			
		-						c	oeffi	cients o	of Uti	lizatio	on						
4	XXX I	90°				pf				2	20%								
	$\mathcal{W}\mathcal{X}$	-	CI	P Summ	ary	pc		80%			70%			50%		Zon	al Lumer	n Summary	
		80°_		0°	90	pw	70%:	50%30	0% 5	50%30%	610%	50%	630%1	0%		Zone	Lumens	% Lamp %	Fixture
200	HX		0°	1114	1114	0	119	119 1	19	116	116 1	16	111	111 1	11	0° - 30°	852	26.3	26.3
-	1X	60°	5°	1092	1118	1	108	103 9	98	100	96	92	96	92	89	0° - 40°	1385	42.7	42.7
400		4																	
600																			
			15°	1042	1075	2	98	89	82	87		75	83	78		0° - 60°	2440	75.3	75.3
800		40°	25°	943	996	3	89	78	69	76		62	73	66	61	0° - 90°	3242	100.0	100.0
			35° 45°	808 653	891 770	$\frac{RC}{R}^{4}_{5}$	81 75	69 61	60 52	67 60	59 52	52 45	65 58	57 50	52 44	90° - 180° 0° - 180°	0 3242	0.0 100.0	0.0 100.0
			45 55°	492	638	R 5	69		46	54		40 39	52	45	39	0 - 100	5242	100.0	100.0
1000			65°	334	501	7	64	50	41		41	35	48	40	34				
			75°	177	359	8	59	46	37	45		31	44	36	31				
0°	20°		85°	44	147	9	56	42	34	41		28	40	33	28				
			90	5	2	10	52		31	38		25	37						
-	<sup>0°</sup> <sup>90°</sup>																		



									Coef	fficients	of U	tiliza	ation							
180°	8H	FI				pf					20%	,								
		+				pc		805	%		70	6		5	0%					
Į]		€ <sup>90°</sup>	C	P Sumn	nary												Zon	al Lumer	Summary	
Ц	$\mathcal{H}\mathcal{M}\mathcal{X}$	80°_		0°	90	pw	70%	50%	30%	50%30	%10	% 5	0%30%	6109	6		Zone	Lumens	% Lamp %	Fixture
200		X	0°	1447	1447	0	119	119	119	110	5116	116	11	11	111	1	0° - 30°	1107	26.3	26.3
400	$\Box X X$		5°	1419	1452	1	108	103	98	10	96	92	9	69	2 89	)	0° - 40°	1799	42.7	42.7
		60°	15°	1354	1396	2	98	89	82	87	80	75	8.	37	8 73	3	0° - 60°	3169	75.3	75.3
600			25°	1224	1294	3	89	78	69	76	68	62	7.	3 6	6 6		0° - 90°	4211	100.0	100.0
			35°	1050	1158	4 RC R	81	69	60	67	59	52	6	55	7 52	2	90° - 180°	0	0.0	0.0
800			45°	849	1001	5	75	61	52	60	52	45	5	8 5	0 44	1	0° - 180°	4211	100.0	100.0
1000			55°	640	829	6	69	55	46	54	46	39	5	24	5 39	•				
1200			65°	434	650	7	64	50	41	49	41	35	4	84	0 34	1				
1400		40°	75°	230	466	8	59	46	37	45	37	31	4	4 3	6 31					
0°	20°		85°	57	191	9	56	42	34	41	33	28	4	03	3 28	3				
			90	7	3	10	52	39	31	38	30	25	3	73	0 25	5				
_	90	Po																		

### Constant Lumen Man

Enabled by the embedded nLight control, the BLT actively tracks its run-time and manages its light source such that constant lumen output is maintained

Performance Data									
Lumen	Lumens	Input	LPW	Lu					
Pagkage	2157	Watte	110	Be					
208340P	2213	20	113	b					
20183450P	2261	20	116	b.f					

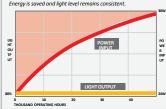
HE Performance Data											
Lumen	Lumens	Input	LPW								
Backage DP	3537	Watts	126								
558AR ADP	3628	28	130								
LERISGE ADP	3708	28	132								

over the system life. Referred to as lumen management, this feature eliminates the energy waste created by the traditional practice of over-lighting.



80%

24W



MOUNTING DATA									
Ceiling Type	Appropria e Trim								
Exposed	Туре								
grid tee (1'	G								
and 9/16") Concealed grid	G								
fee Plaster or	G*								
plasterboard	15/16								
9/16	15/16								

2BLT-2X2



\*DGA accessory available to provide ceiling trim flange and fixture support for plaster or plasterboard ceiling. Recommended rough-in dimensions for DGA installation is 24-3/4" x 24-3/4" (Tolerance is +1/8", -0").



An **Cuity**Brands Company

LED: One Lithonia Way Conyers, GA 30012 770-929-8789 www.lithonia.com Phone: 800-858-7763 Fax: © 2015-2016 Acuity Brands Lighting, Inc. All rights reserved. Rev. 10/06/16

# SYLVANIA LEDVANCE Luminaire s Wall Pack Non-Cutoff

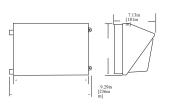


Catalog#	Туре
Project	
Notes	
Date	
Prepared by	

#### Dimensions Front View

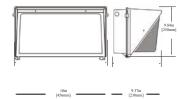
30W-80W

Front View View 105W



Side View

Side



The Wal luminair environr preferab alternati tradition luminair

**Product Features** 

to 77% in energy savings. Ideal in place of

traditional luminaires, or as new installations, the Wall Pack series is offered in several wattages/lumen packages for illuminating building exteriors, outdoor corridors, walkways, and stairwells.

The housing is a perfect fi for replacing existing traditional luminaires. The luminaires are available with optional photo control. LEDVANCE luminaires assure optimum light engine performance for extended service and rated life  $(\geq 150,000)$ 

1	70
hour	S
-	)
L	

### Wattage Comparison

Non-Cutoff Wall Packs (UNV/347)

### **Specifications**

**Weight:** UNV: 13.8lbs (6.3kg) 347V: 15lbs (6.8kg) UNV (105W): 16.5lbs (6.8kg)

Dimensions in inches (mm).

**Construction:** Two-piece cast aluminum alloy housing with powder coat paint fi and a glass lens. The standard color is bronze.

**LED System:** LED system with a life rating of  $\geq 150,000$  hours at  $L_{70}@25^{\circ}C$ . Luminaire effi y up to 125 LPW.

## **Electrical:** Offered in 30, 36, 50, 75 and 105 Watts, the luminaire is designed to

operate through the 120-277  $V_{ac}$  universal voltage range. Offered in 40, 55, and 80 Watts, the luminaire is designed to operate at the  $347V_{ac}$  voltage range. The LED driver has a 4kV inherent surge suppression and is a constant current device,

meeting UL1310 and UL48 Class 2 with built-in over temperature protection. The power factor is  $\geq$ 90% and THD is  $\leq$ 20%.

Traditional Source	Traditional System	LED System Wattage	Energy Savings
70W HPS	Wattage	30/36/40	67%/60%/56%
100W HPS	120	30/36/40	7659/01/70%/67%
100W MH	130	30/36/40	77%/72%/69%
70W HPS	91	50/55	45%/40%
100W HPS	120	50/55	58%/54%
100W MH	130	50/55	62%/58%
150W HPS	170	50/55	71%/68%
150W MH	188	50/55	73%/71%
175W MH	210	50/55	76%/74%
175W MH	210	75/80	64%/62%
250W MH	290	75/80	74%/72%
250W HPS 320W MH	295 370	75/80 105	75%/73% 72%
400W HPS	460	105	77%
400W MH	450	105	77%

Color Characteristics: CRI>70; CCT of 4000K or 5000K.

**Optics:** Non-cutoff distribution with a borosilicate glass lens (top accessory available).

Installation: Luminaire mounts to exterior wall. Operating Temperature: -40°F to +104°F (-40°C to +40°C); EM: +32°F to +104°F (0°C to +40°C).

Listings: cULus listed to UL1598 standards for wet locations. Warranty: Standard 5-year luminaire warranty (LEDLUM001).

Note: tions Specifi CULUSUS

tions subject to change without notice. IES fi available RoHS



### **Ordering Guide**

Item Number:

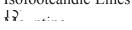
WALPAK	XX /	XXX	XXX	7	XX	/	NC /	,	BZ	/	X
Product Name	Generation	Wattage (UNV)	Voltage	7 =>70	Color Temp (CC	CT)	Optics		Color/Finish		Options
WALPAK	1N Options 2N Photocontrol*	030=30 Watts 036=36 Watts	UNV=120-277V 347=347V	r	40=4000K* 50=5000K		NC=Non-cutoff Distribution		BZ = Bronze		Blank = No P =
		050=50 Watts									$E = Emergency^{**}$
		075=75 Watts									
		0105=105 Watts									
		Wattage (347V) 040=40 Watts									0
*Available in UNV	only	055=55 Watts									SYLVANIA
** Made to order (MT Available in 50W1		080=80 Watts					<b>5Y</b>		VA		

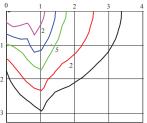
LEDLUM005R9 3-17

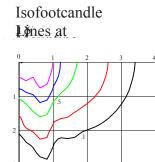
### Photometric Data (UNV/347V)

### WALPAK2N/05 0HNV750/NC

## WALPAK2N/030UNV750/NC Isofootcandle Lines at

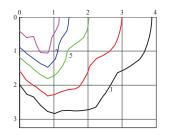






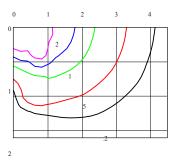
### WALPAK2N/075UN V750/NC

Isofootcandle Lines at 20' Mounting Height



### WALPAK3N/105UNV740/NC

Isofootcandle Lines at 25' Mounting Height



3

.1

For other mounting heights apply the following multipliers:

-							_																		
Mounting						Mounting						M	founting							Mounting					
Height	12'	15'	18'	20'	22'	Height	15'	18'	20'	22'	25'	Н	Ieight	15'	18'	20'	22'	25'		Height	22'	25'	30'	32'	35'
Multiplier	1.56	1.00	0.69	0.56	0.46	Multiplier	1.44		0.81	0.67	0.52	M	Aultiplier	1.78	1.23	1.00	0.83	0.64		Multiplier	1.29		0.69	0.61	0.51

### **Ordering Information**

Item	Ordering	Power	Input		Color		Total			BUG	
Numb	Abbreviati	(W)	Voltag	CRI	Temp	Distribution		LPW*	DLC**	Rating	Options
<b>@4</b> 198	WMALPAK1N/036UNV740/NC/BZ	36	<b>@</b> 20-277V	>70	(ACCO)X	Type IV	<b>B</b> 5000ens	96	Std	B1-U4-G3	-
74201	WALPAK1N/036UNV750/NC/BZ	36	120-277V	>70	5000K	Type IV	3300	95	Std	B1-U3-G3	-
74202	WALPAK1N/050UNV750/NC/BZ	50	120-277V	>70	5000K	Type IV	5300	108	Std	B1-U4-G3	-
74200	WALPAK1N/075UNV740/NC/BZ	75	120-277V	>70	4000K	Type IV	8600	115	Std	B1-U5-G5	-
74203	WALPAK1N/075UNV750/NC/BZ	75	120-277V	>70	5000K	Type IV	8600	115	Std	B1-U5-G5	-
74216	WALPAK1N/036UNV740/NC/BZ/P	36	120-277V	>70	4000K	Type IV	3500	96	Std	B1-U4-G3	Photocontrol
74219	WALPAK1N/036UNV750/NC/BZ/P	36	120-277V	>70	5000K	Type IV	3300	95	Std	B1-U3-G3	Photocontrol
74217	WALPAK1N/050UNV740/NC/BZ/P	50	120-277V	>70	4000K	Type IV	5000	104	Std	B1-U4-G3	Photocontrol
74220	WALPAK1N/050UNV750/NC/BZ/P	50	120-277V	>70	5000K	Type IV	5300	108	Std	B1-U4-G3	Photocontrol
74218	WALPAK1N/075UNV740/NC/BZ/P	75	120-277V	>70	4000K	Type IV	8600	115	Std	B1-U5-G5	Photocontrol
74221	WALPAK1N/075UNV750/NC/BZ/P	75	120-277V	>70	5000K	Type IV	8600	115	Std	B1-U5-G5	Photocontrol
72996	WALPAK1N/040347750/NC/BZ	40	347V	>70	5000K	Type IV	4300	102	Std	B1-U4-G3	-
72997	WALPAK1N/055347750/NC/BZ	55	347V	>70	5000K	Type IV	6300	108	Std	B1-U4-G3	-
72998	WALPAK1N/080347750/NC/BZ	80	347V	>70	5000K	Type IV	9400	120	Std	B1-U5-G5	-
74499	WALPAK1N/050UNV840/NC/BZ/E	50	120-277V	>70	4000K	Type IV	5000	104	Std	B1-U4-G3	Emergency Battery
74500	(MALOP)AK1N/050UNV850/NC/BZ/E	50	120-277V	>70	5000K	Type IV	5300	108	Std	B1-U4-G3	Bandridency Battery
74386	(MALQP)AK2N/030UNV740/NC/BZ	30	120-277V	>70	4000K	Type IV	3400	122	Prm	B1-U4-G3	Backup
74482	WALPAK2N/030UNV750/NC/BZ	30	120-277V	>70	5000K	Type IV	3500	125	Prm	B1-U3-G3	-
74485	WALPAK2N/050UNV740/NC/BZ	50	120-277V	>70	4000K	Type IV	5500	113	Std	B1-U4-G3	-
74486	WALPAK2N/050UNV750/NC/BZ	50	120-277V	>70	5000K	Type IV	5600	116	Std	B1-U4-G3	-
74489	WALPAK2N/075UNV740/NC/BZ	75	120-277V	>70	4000K	Type IV	8900	118	Std	B1-U5-G5	-
74490	WALPAK2N/075UNV750/NC/BZ	75	120-277V	>70	5000K	Type IV	9200	121	Std	B1-U5-G5	-
74387	WALPAK2N/030UNV740/NC/BZ/P	30	120-277V	>70	4000K	Type IV	3400	122	Prm	B1-U4-G3	Photocontrol
74483	WALPAK2N/030UNV750/NC/BZ/P	30	120-277V	>70	5000K	Type IV	3500	125	Prm	B1-U3-G3	Photocontrol

74487	WALPAK2N/050UNV740/NC/BZ/P	°50	120-277V >70	4000K	Type IV	5500	113	Std	B1-U4-G3 Photocontrol
74488	WALPAK2N/050UNV750/NC/BZ/P	° 50	120-277V >70	5000K	Type IV	5600	116	Std	B1-U4-G3 Photocontrol
74491	WALPAK2N/075UNV740/NC/BZ/P	°75	120-277V >70	4000K	Type IV	8900	118	Std	B1-U5-G5 Photocontrol
74492	WALPAK2N/075UNV750/NC/BZ/P	°75	120-277V >70	5000K	Type IV	9200	121	Std	B1-U5-G5 Photocontrol
74528	WALPAK3N/105UNV740/NC/BZ	105	120-277V >70	4000K	Type IV	12500	119	Std	B3-U4-G4 –
74529	WALPAK3N/105UNV750/NC/BZ	105	120-277V >70	5000K	Type IV	12500	119	Std	B3-U4-G4 –

\*LPW per LM79 report.

\*\*Prm for DLC Premium; Std for DLC Standard

For further information and to learn more about utility rebates, contact your local SYLVANIA sales representative.

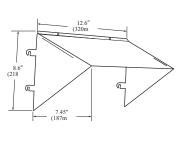
### **Options Information**

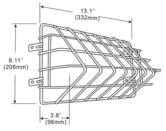
### **Emergency Battery Backup:**

Activates when normal power supply to fixture fails, providing a minimum of 500 lumens for at least 90 minutes.

### **Accessories and Replacement Parts**

30W-80W Item Number	Ordering Abbreviation	
74390	WALPAK1N/TOPVISOR/E	3 Top Visor, Bronze Finish
74391	₩ALPAK1N/WIREGUARI	D Wire Guard
74397	WALPAK1N/LENS/BZ	Replacement Glass Lens with
74445	WALPAK1N/PCLENS/BZ	For the second s



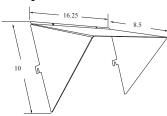


### 150W

Item Number	Ordering Abbreviation It	emDescription
xxxxx	WALPAK3N/TOPVISOR/BZ	Top Visor, Bronze Finish
xxxxx	WALPAK3N/ WIREGUARD Wire Guard	

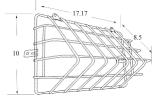


**Top Visor** 





Wire Guard



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www.sylvania.com

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/sylvania

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## QUICKTRONIC® QHE LED T8

Universal Voltage Systems

### Low Power LED System





LED15T8 SubstiTUBE<sub>®</sub> LED T8 Lamps 1-lamp QHE 1xLEDT8/UNV-ISL-SC

2- lamp QHE 2xLEDT8/UNV-ISL-SC

3- lamp QHE 3xLEDT8/UNV-ISL-SC

4- lamp QHE 4xLEDT8/UNV-ISL-SC

Also operates

LED12T8/L36, LED08T8/L24, LED15T8/U

### **Key System Features**

- Up to 127 LPW (lumens/watt) with SubstiTUBE LED T8
- Lowest power LED T8 Systems
- Universal voltage (120-277)
- Small Can enclosure size
- Up to 58% energy savings compared to T12 magnetic systems
- Ambient Starting Temp:
  -4°F to 122°F (-20°C to 50°C)
- —<20% THD
- RoHS compliant
- Lead-free solder and manufacturing process

### **Application Information**

### OSRAM QUICKTRONIC QHE LED T8 are

### ideally suited for:

- Any applications where the lowest power T8 systems are needed for maximum energy savings
- Commercial & Retail
- Energy Management
- Energy Retrofi
- Hospitality & Institutional
- New Construction

OSRAM QUICKTRONIC High Efficiency LED T8 (QHE LED) Electronic Control Gears (ECG) offer several advantages:

1. Optimized design for SubstiTUBE LED T8

- Up to 38% in energy savings compared to standard T8 Fluorescent systems
- Maximum energy savings when compared to F34T12 magnetically ballasted systems
- 2. Parallel Circuitry: keeps remaining LED T8 lit if one or more go out.
- 3. Banded Packaging
- Distributor-friendly for easy stocking and individual sales
- ESCO friendly for fast installation
- Reduced waste
- Easy removable bands
- No tangled wires

These ECGs are also RoHS compliant and feature lead-free solder and manufacturing process.



### OSRAM QUICKTRONIC High Effi

LED T8

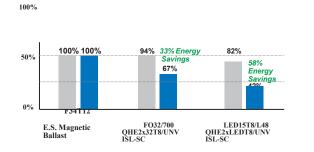
(QHE LED) systems are covered up to 8 years by the SubstiTRONIC<sup>™</sup> warranty, the most comprehensive LED system warranty in the industry.

### **System Information**

## OSRAM QUICKTRONIC QHE LED T8 System

advantages:

- Operate from 120V through 277V
- Eliminates "wrong voltage" errors
- Highest System Effi



% Relative Light Output (Mean Lumens) % System Wattage (Power)

Q

System Description	Input Power (W)	Initial System Lumens	System Efficacy LPW	Relative Initial Light Output	Energy Savings
F34T12 - E.S. Magnetic Ballast	72	4660	65	Baseline	Baseline
FO32/700 - QHE2x32T8/UNV ISL-SC	48	4370	91	94%	33%
LED15T8/L48 - QHE2xLEDT8/UNV	30	3800	127	82%	58%
ISL-SC					



ECS284 1-16

Specifi Data

### High Efficiency Universal Voltage (120-277V) Low Power LED **Systems**

ltem Number	Electronic Control Gear	Input Current (AMPS)	SubstiTUBE LED	No. of LED T8	System Lumens (Im)	Input Power (W)	System Efficacy (Im/W)
75307	(ECG)XLEDT8/UNV ISL-SC	0.13/0.06	<b>T8</b> D15T8/L48	1	1900	15	127
		0.11/0.05	LED12T8/L36	1	1350	12	113
		0.08 / 0.04	LED08T8/L24	1	1050	10	111
75308	QHE2XLEDT8/UNVISL-SC	0.26 / 0.12	LED15T8/L48	2	3800	30	127
		0.22/0.10	LED1218/L36	2	2900	26	114
		0.16/0.08	LED08T8/L24	2	2100	19	111
75309	QHE3XLEDT8/UNV ISL-SC	0.38/0.17	LED15T8/L48	3	5700	45	127
		0.04/0.15		2	4500	10	
		0.34/0.15	LED12T8/L36	3	4500	40	114
		0.24 / 0.11	LED08T8/L24	3	3150	29	111
75310	QHE4XLEDT8/UNV ISL-SC	0.51/0.23	LED15T8/L48	4	7600	60	127
		0.44/0.20	LED1218/L36	4	5850	52	114
		0.32/0.14	LED08T8/L24	4	4200	38	111

Item No.

75150

75151

75152

75145

bend

#### Use only SubstiTUBE IPS LED with Item No. 75181 T8. LED T8 Description Length LED15T8/L48/F/830/SUB/G5 4ft 75182 LED15T8/L48/F/835/SUB/G5 4ft LED15T8/L48/F/841/SUB/G5 75183 4ft

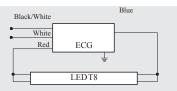
75184	LED15T8/L48/F/850/SUB/G5	4ft	75153	LED12T8/L36/F/850/SUB/G5	

Item No.	LED T8 Description	Length	<u>Item No</u> . 75141
75146	LED08T8/L24/F/830/SUB/G5	2ft	bend
75147	LED08T8/L24/F/835/SUB/G5	2ft	75142
75148	LED08T8/L24/F/841/SUB/G5	2ft	bend
75149	LED08T8/L24/F/850/SUB/G5	2ft	75143 bend

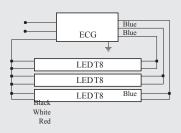
\*For additional SubstiTUBE LED T8 details, please refer to LED465

For additonal SubstiTUBE CURVALUME IPS LED T8 details please refer to LED464.

### **Wiring Diagrams**



QHE 1x32



Black		Blue
White		,
Red		Blue
•	ECG	
	Ŧ	-
	LEDT8	
•	LEDT8	•

LED T8 Description

LED T8 Description

LED15T8/U/F/830/SUB/G5

LED15T8/U/F/835/SUB/G5

LED15T8/U/F/841/SUB/G5

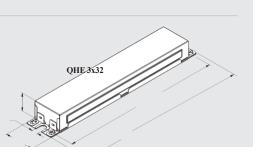
LED15T8/U/F/850/SUB/G5

LED12T8/L36/F/830/SUB/G5

LED12T8/L36/F/835/SUB/G5

LED12T8/L36/F/841/SUB/G5

Yellow	QHE 2x32 ECG	Blue Red Red
Black	LEDT8	Blue
	LEDT8	
Yellow	LEDT8	
	LEDT8	



Performance Guide
Data based upon SubstiTUBE <sub>®</sub> LED T8 shown. QHE LED T8 Electronic Control Gear will operate LED15T8/L48, LED12T8/L36, LED08T8/L24 and LED15T8/U.

Q

H

E

L

E D Т

Туре Catalog#

Project Comments Prepared

Length 3ft 3ft 3ft 3ft	Specifications
	System Output: Low Power
	Circuit Type: Parallel
	Ambient Operating Temperature:
	-4°F to 122°F (-20°C to 50°C)
	Input Frequency: 50/60 Hz
Shape	Low THD: <20%
U-	PowerFactor:>90%
U-	VoltageRange:±10%of120-277Vrated line (108-305V)
U-	cETLus Listed Class P, Type 1 Outdoor 70°C Max Case
U-	Temperature
	FCC 47CFR Part 18 Non-Consumer Class A Sound Rating

RoHS Compliant<sub>1</sub>

Dimensions:

provided)

Mounting: 8.90"

Overall: 9.5" L x 1.68" W x 1.18" H

ANSI C62.41 Cat. A Transient Protection Remote Mounting (Max. wire length from case to lampholder): 20 ft

1 Complies with European Union Restriction

of Hazardous Substances (Directive EC 2002/95)

QHE 4x32

System Life / Warra nty

QUICKTRONIC H i

g h f f i c

i e n c y Q H E L E D p r o d u c t

s a r

e o v e r e d u p t o 8 y e a r

s b y t

h e S u b s t i T R O N I C ™ w a r

r a n t y

, t h e m o s t c o m p r e h e n sive LED system warranty in the industry. For additional warranty details, please refer to LED285.

For additional information refer to the warranty section of www.sylvania.com



### **Ordering Guide**

### Town of Natick Contract for Services Related to the LED Retrofit of Eliot School

Item Number	75307 QHE 1 x LEDT8 / UNV ISL-SC
QUICKTRONIC High Efficiency	Number of LED T8

SYLVANIA and SubstiTUBE are registered trademarks.

OSRAM and QUICKTRONIC are registered trademarks of OSRAM GmbH. Specifications subject to change.

Town of Natick Contract for Services Related to the LED Retrofit of Eliot School

### Town of Natick Contract for Services Related to LED Conversion of DPW Equipment Maintenance

This Agreement is made this \_\_\_\_\_\_day of \_\_\_\_\_\_, 2018, by and between the Town of Natick with an address of Natick Town Hall, 13 East Central Street, Natick, MA 01760, by the Natick Board of Selectmen (hereinafter the "Town," or the "Client"), and Horizon Solutions, LLC, a limited liability corporation with a principal place of business at 175 Josons Drive, Rochester, New York 14623 (hereinafter the "Contractor" or "Horizon").

The words "he," "him" and "his" in this Agreement, as far as they refer to the Contractor, shall so refer whether the Contractor is an individual, partnership or corporation. All prior contracts, if any exist between the Town and the Contractor, are hereby terminated and shall be of no force and effect.

1. Scope of Services and Scheduling

In consideration of the obligations herein contained, Horizon shall perform the work included in the scope of work in the Horizon proposal dated January 23, 2017 (the "Project"), which is attached hereto and incorporated herein by reference. All materials shall be new and shall meet UL, Federal, State and Local code requirements. Any material change to the scope of work, including acceptance of the additional cost for the work, shall be agreed upon by both parties in writing before the work is performed. The work will be considered complete, with the exception of any minor open items, after the Client and Utility representative review and approval of the work (herein referred to as the "certificate of completion").

Horizon provides this proposal based on Prevailing wage requirements, if applicable, and all work performed during normal work week (7:00 A.M. to 3:30 P.M. local time), unless otherwise stated in the proposal.

Horizon shall install the Project with regard for the appearance and condition of the Client's property. Waste material shall be removed daily.

The Client will cooperate and coordinate with Horizon on scheduling and maximize productivity on Energy Conservation projects. The Client will allow Horizon access to areas of the building to ensure rapid, efficient installation and completion of the Project.

2. Standard of Care

The Contractor's services shall be performed as expeditiously as is consistent with professional skill and care and the orderly progress of the work. The Contractor shall exercise due care and diligence in the rendition of all services under this Agreement in accordance with the applicable professional standards in the eastern Massachusetts area. The Contractor's services shall be performed as expeditiously as is consistent with such standards.

3. Term

The term of this Agreement shall be for one (1) year, commencing as of the execution date of this Agreement, and ending one (1) year later.

4. Order of Priority of Agreement Documents

In the event of any conflict among the Agreement Documents, the Documents shall be construed according to the following priorities:

Highest Priority: Second Priority: Amendments to Agreement (if any) Agreement

#### 5. Payment

In consideration for performance of the work in accordance with the requirements of this Agreement, the Client shall pay Horizon the prices set forth in Exhibit A, which is attached hereto and incorporated by reference.

This Agreement is a fixed price/fixed rate contract; and, therefore, miscellaneous expenditures associated with Horizon's work on the Project shall not be paid by the Client. In the event that an unforeseen miscellaneous expense is incurred, Horizon shall receive the Client's approval in writing prior to incurring the expense if it will subsequently seek payment of said expense from the Client.

Payment shall be made to Horizon for work completed in accordance with this Agreement. All requests for payment shall be submitted to the Client as an invoice and shall specify work completed, progress made toward completing deliverables, the number of hours worked, the classification of each employee who performed work, and the billing rate for each employee who performed work on the Project.

Payment will be due thirty (30) days after receipt of Horizon's invoice by the Client for services rendered in accordance with this Agreement. The Client shall not make payments in advance.

If the Client objects to all or part of any invoice, the Client shall notify the Horizon in writing within two (2) weeks of the date of receipt of the invoice, and shall pay that portion of the invoice not in dispute within thirty (30) days after the date of receipt of the invoice.

Should it be necessary for Horizon to engage the services of a specialized contractor or companies other than those originally proposed in Horizon's proposal, Horizon shall take such measures only with the Client's prior written approval. Charges for such services shall be billed directly to the Client unless otherwise agreed upon by the parties.

Payment of the amounts due under this Agreement shall release the Town of Natick and its officers, employees, boards, commissions, committees, agents and representatives, from any and all claims and liability in any way relating to this Agreement or anything done in pursuance thereof.

No payment by the Client to Horizon shall be deemed to be a waiver of any right of the Client under this Agreement or a ratification by the Client of any breach hereof by Horizon.

#### 6. Warranty

It is understood and agreed that Horizon will perform all services hereunder in a professional manner with appropriately skilled employees or subcontractors. Horizon warrantees the workmanship for one (1) year from the date of the certificate of completion and shall assign all applicable Manufacturers' warranties for products used on the Project to the Client. Horizon shall also assist in completing all applicable warrantee registration forms and explain the warrantee process for these Manufacturer warranties.

7. Compliance with Laws

Horizon shall comply with all provisions of Federal, Massachusetts and Town of Natick law applicable to his work including, without limitation, statutes, by-laws, rules, regulations, orders and directives, as amended, and including, without limitation, the Williams-Steiger Occupational Safety and Health Act, as amended, and related regulations, as amended, in effect throughout the term of this Agreement and any extension or renewal thereof. Without limitation, Horizon shall comply with the provisions of Chapter 149, Section 26 to 27D of the Massachusetts General Laws, as amended, and the applicable minimum wage rates as determined by the Massachusetts Commissioner of Labor and Industries. This Agreement shall be considered to include in their entirety all terms respecting workers' compensation insurance and other terms required to be included in it by Chapter 152 of the Massachusetts General Laws, as amended, as though such terms were set forth in their entirety herein.

#### 8. Insurance

Horizon shall insure and shall require each of its subcontractors to carry the following insurance to the extent stated:

- a. Workers' Compensation Insurance as required by the laws of the Commonwealth of Massachusetts and employer's liability insurance in the amount of \$1,000,000/\$1,000,000.
- b. Commercial General Liability Insurance, \$1,000,000 each occurrence and \$2,000,000 aggregate limit. Commercial General Liability insurance shall include personal injury liability, broad form property damage liability, products/completed operations liability and broad form contractual liability.
- c. Automobile Liability Insurance, covering all non-owned and hired vehicles Combined single limit of \$1,000,000.
- d. Professional Liability Insurance, covering errors and omissions, \$1,000,000 each occurrence and \$2,000,000 aggregate limit.
- e. Excess Liability Insurance, Umbrella Form \$1,000,000 each occurrence and \$2,000,000 aggregate, which shall be following form, providing coverage over commercial general liability insurance and employer's liability under workers' compensation insurance.
- f. The Town of Natick shall be named as additional insured on each such policy of Commercial General Liability Insurance and, if required, Automobile Liability Insurance.
- g. All certificates and policies shall contain the following provision:

"Notwithstanding any other provision herein, should any of the above policies be cancelled or materially amended before the expiration date thereof, the issuing company will mail thirty (30) days prior written notice thereof to the named certificate holder and to the Natick Town Administrator, Natick Town Hall, 13 East Central Street, Natick, MA 01760, before such cancellation or amendment shall take place."

h. Certificates evidencing such insurance in five (5) copies shall be furnished to the Client at the execution of this Agreement. Such certificates shall not merely name the types of policy

provided, but shall specifically refer to this Agreement and shall state that such insurance is as required by this Agreement. Horizon shall make no claims against the Town of Natick or its officers for any injury to any of its officers or employees or for damage to its equipment arising out of work contemplated by the Agreement.

- i. Horizon shall also be required to provide to the Town of Natick with its proof of insurance coverage endorsements or riders to the policies of commercial general liability insurance and, if required, automobile liability insurance, which indicate that the Town of Natick are named as additional insureds on each such policy.
- j. No insurance shall be obtained from an insurer which:

1. is not licensed to sell insurance in the Commonwealth of Massachusetts; or

2. is not authorized to provide insurance as an excess or surplus lines insurer, and does not have a current Best's rating of A or better.

- k. Failure to provide and continue in force such insurance as aforesaid shall be deemed a material breach of this Agreement and shall operate as an immediate termination thereof.
- 9. Indemnification

Horizon shall compensate the Client for all damage to the Client's property of any nature arising out of Horizon's work. To the fullest extent permitted by law, Horizon shall indemnify, defend, and hold harmless the Town of Natick and all of its officers, employees, boards, commissions, committees, agents and representatives from and against all claims, causes of action, suits, costs, damages, and liability of any kind which arise out of the breach by Horizon of its obligations under this Agreement, or the act or omission of Horizon, its subcontractors, or their officers, employees, agents and representatives or anyone directly or indirectly employed by them, or anyone for whose acts or omissions they may be liable, regarding the work to be performed by Horizon under the Agreement, or which arise out of the violation of any federal, Massachusetts or Town of Natick statute, by-law, rule, regulation, order or directive, or which relate to personal injury or property damage suffered by Horizon or any of its officers or employees regarding the subject matter of this Agreement. Said costs shall include, without limitation, legal costs, collections fees, and counsel fees incurred in defending any claim or suit that may be brought against the Client and any judgment that may be obtained in any such claim or suit.

#### 10. No Personal Liability

Neither the Town of Natick, nor its officers, employees, boards, committees, commissions, agents and representatives shall be under any personal obligation or incur any personal liability by reason of this Agreement, the execution thereof or anything relating thereto which arises out of the breach or violation of any provision of this Agreement, or the violation of any Federal, Massachusetts or Town of Natick statute, by-law, rule, regulation, order or directive, or which relates to personal injury or property damage suffered by Horizon or its employees, regarding the subject matter of this Agreement.

#### 11. Familiarity with Area of Work

By signing this Agreement, Horizon acknowledges that it has examined the subject matter of this Agreement, including, without limitation, the provision of energy consulting services, and that it is familiar with all sites which are the subject of this Agreement in the Town of Natick and with all conditions of this Agreement. Horizon has entered into this Agreement in reliance on its own examinations and estimates as to the amount and character of its work, and conditions which may be encountered in the performance thereof, and shall assume all risks and bear all losses pertaining thereto.

The nature of Horizon's work includes the installation of energy efficiency equipment and solutions. Horizon does not take responsibility for the following existing conditions at the Project site: existing code violations, structural issues, deteriorating wiring and hazardous material, such as asbestos, lead paint, and oil. To the extent that Horizon and/or its officers, employees, agents, subcontractors or consultants do not cause the presence of hazardous material at the Project site, Horizon and its officers, employees, agents, subcontractors and consultants shall have no responsibility for the discovery, presence, handling, removal or disposal of, or exposure of persons to, hazardous material in any form at the Project site. If Horizon discovers hazardous material at the Project site, it shall immediately notify the Client in writing and shall refrain from disturbing or taking any action with respect to the hazardous material in the absence of the Client's written direction. In the event Horizon does disturb such hazardous material or does take such action without written direction, the limitation of liability in this paragraph shall not apply.

12. Performance Bond

DELETED – NOT APPLICABLE.

13. Labor and Materials Payment Bond\_

DELETED – NOT APPLICABLE.

14. Independent Contractor Status

Horizon shall provide services under this Agreement as an independent contractor with the Town of Natick and not as an employee of the Town. No employee, agent or representative of Horizon shall be entitled to receive any benefits of employment with the Town of Natick, including without limitation salary, overtime, vacation pay, holiday pay, sick leave, health insurance, life insurance, pension or deferred compensation.

15. Use of Alcohol and Controlled Substances Prohibited

Horizon hereby acknowledges that the use of alcoholic beverages, narcotics, and mood altering substances, except for current valid, legal prescriptions, by any officer, employee, agent, or representative of Horizon is prohibited on Town property which is the subject matter of this Agreement and during all hours of work under this Agreement. If any officer, employee, agent, or representative of Horizon violates the foregoing provision, the Client shall have the right to order that such officer, employee, agent, or representative of Horizon shall not be permitted to return to work on this Agreement. Under such circumstances, Horizon shall promptly remove the subject officer, employee, agent, or representative from the job site and shall not permit the subject officer, employee, agent, or representative to perform further work in conjunction with this Agreement.

16. No Smoking

Pursuant to Massachusetts General Laws (M.G.L.) c. 270, §22, the Commonwealth of Massachusetts Smokefree Workplace Law, Horizon, its officers, employees, agents, and representatives shall refrain from smoking and from using tobacco products in any public building in the Town of Natick.

#### 17. Criminal Background Screening

For each employee of Horizon who is performing services under this Agreement, Horizon shall, subject to its confidentiality and privacy obligations owing to its employees and third parties, provide a written confirmation to the Client that such employee passed Horizon's pre-employment criminal background screen. In the event that any employee refuses to permit Horizon to provide such information to the Client, Horizon shall not assign such employee to perform services for the Client, and such employee shall not be authorized to perform services for the Client. The Client shall be permitted to keep such information in its files.

#### 18. Delays/Force Majeure

Except as specifically set forth in this Agreement, neither party shall hold the other responsible or liable for damages or delays in performance caused by acts of God, interruptions in the availability of labor, or other events beyond the control of the other party, or that could not have been reasonably foreseen or prevented. For this purpose, such acts or events shall include unusually severe weather affecting performance of services, floods, epidemics, wars, riots, strikes, lockouts, or other industrial disturbances, protest demonstrations, and project site conditions which could not have been reasonably anticipated. Should such acts or events occur, both parties shall use their best efforts to overcome the difficulties arising and to resume as soon as reasonably possible the normal pursuit of the services for the Project.

#### 19. Termination

- a. If Horizon shall breach any provision of this Agreement, which breach is not cured within twenty-one (21) days of written notice thereof from the Client to Horizon, the Client shall have the right to terminate this Agreement upon written notice to Horizon.
- b. If any assignment shall be made by Horizon or by any guarantor of Horizon for the benefit of creditors, or if a petition is filed by Horizon or by any guarantor of Horizon for adjudication as a bankrupt, or for reorganization or an arrangement under any provision of the Bankruptcy Act as then in force and effect, or if an involuntary petition under any of the provisions of the Bankruptcy Act is filed against Horizon and such involuntary petition is not discharged within ninety (90) days thereafter, in any event the Client may terminate this Agreement upon written notice to Horizon.
- c. The award of this Agreement and the continued operation of this Agreement are contingent upon appropriation by Natick Town Meeting of sufficient money to fund the Agreement. Should Natick Town Meeting fail to appropriate necessary funds therefore, the Client shall no longer be under any obligation to tender performance, including payment, under the terms of this Agreement. In that event, the Client may terminate this Agreement upon written notice to Horizon.
- d. The Client may terminate this Agreement upon written notice to Horizon if a source of money to fund the Agreement is lost during the Agreement term. In the alternative, the

parties may agree in writing to amend the Agreement to provide for an Agreement price which represents a reduced appropriation for the Agreement term.

e. The Client may also terminate this Agreement for convenience upon thirty (30) days' written notice to Horizon.

In the event of termination Horizon shall be entitled to be paid for services rendered in accordance with this Agreement prior to termination.

In the event that this Agreement is terminated pursuant to Section a. or b. above, the Client may make any reasonable purchase or contract to purchase services in substitution for services due from Horizon and may deduct the cost of any substitute contract, or damages sustained by the Client due to non-performance or non-conformance of services together with incidental and consequential damages from the Agreement price, and shall withhold such damages from sums due or sums which become due.

#### 20. Notices

Except as otherwise provided in this Agreement all notices required or permitted to be given hereunder shall be in writing and shall be delivered by certified mail or registered mail, return receipt requested, to the parties at the following address or such other address or addresses as to which a party shall have notified the other party in accordance with this Section.

If to the Town of Natick:	Melissa A. Malone Town of Natick 13 East Central Street Natick, MA 01760
With copies to:	Karis North, Esq. Murphy, Hesse, Toomey & Lehane, LLP 300 Crown Colony Drive, Suite 410 Quincy, MA 02169
If to Horizon:	President Horizon Solutions LLC 175 Josons Drive Rochester, NeNY14623.

#### 21. Miscellaneous Provisions

- a. Any action at law or suit in equity instituted by Horizon as a result of the performance, nonperformance or alleged breach of this Agreement shall be filed in the Superior Court of the Commonwealth of Massachusetts for Middlesex County, MA, and in no other court or jurisdiction.
- b. No action or failure to act by either party shall constitute a waiver of a right or duty afforded to that party under the Agreement, nor shall such action or failure to act constitute approval of or acquiescence in a breach thereunder, except as may be specifically agreed in writing. No forbearance or indulgence in any form or manner by either party shall be construed as a

waiver or in any way limit the legal or equitable remedies available to that party. No waiver by either party of any default or breach by the other party shall constitute a waiver of any subsequent default or breach.

- c. If Horizon discovers or is informed of any discrepancy or inconsistency in the Agreement Documents in relation to any law, statute, ordinance, by-law, decree, code, rule, regulation, or order, Horizon shall promptly, before commencing services under this Agreement, report the same to the Client in writing.
- d. Horizon acknowledges that it has not been influenced to enter into this Agreement, nor has Horizon relied upon any warranties or representations not set forth in this instrument.
- e. Horizon shall maintain the confidentiality of information designated by the Client as confidential, unless withholding such information would violate the law or create a risk of significant harm to the public, or unless Horizon has been required to release such information by final judgment or order of a court of competent jurisdiction, or unless the Client has expressly waived such confidentiality in advance in writing.
- g. Horizon shall not represent or purport to represent that it speaks for the Client vis-à-vis the media or the public at-large without the Client's express, written consent in advance.
- h. Prior to commencing services under this Agreement, Horizon shall furnish the Client, in writing, the names, addresses and telephone numbers of not fewer than two (2) principal employees of his business who are to be contacted in the event of an after-hours emergency.
- i. By entering into this Agreement, Horizon certifies under penalties of perjury that its entry was made and submitted in good faith and without collusion or fraud with any person. As used in this certification, the word "person" shall mean any natural person, business, partnership, corporation, union, committee, club, or other organization, entity, or group of individuals.
- j. By entering into this Agreement, Horizon certifies under the penalties of perjury, pursuant to M.G.L. c.62C, Section 49A(b), that it has complied with all laws of the Commonwealth relating to taxes, to reporting of employees and contractors, and to withholding and remitting child support.
- k. Prevailing wage rates, as contained in the Bid documents, shall be paid, pursuant to M.G.L. c.149, §§26-27G, if they are applicable.
- 1. Horizon understands that the Massachusetts Conflict of Interest Law, Chapter 268A of the Massachusetts General Laws, applies to Horizon with respect to the services required to be provided under this Agreement. Horizon and its officers, employees, agents, subcontractors and affiliated agencies shall not participate in any activity which constitutes a violation of the Massachusetts Conflict of Interest Law or which creates an appearance of a violation of the Massachusetts Conflict of Interest Law.
- m. Horizon shall not discriminate against or exclude any person from participation herein on grounds of race, color, religious creed, national origin, sex, gender identity, sexual orientation (which shall not include persons whose sexual orientation involves minor children as the sex object), age, genetic information, ancestry, children, marital status,

veteran status or membership in the armed services, the receiving of public assistance, and handicap. The previous sentence shall include, but not be limited to, the following: advertising, recruitment; hiring; rates of pay or other forms of compensation; terms; conditions or privileges of employment; employment upgrading; transfer; demotion; layoff; and termination. Horizon shall take affirmative actions to insure that applicants are employed, and that employees are treated during their employment, without regard to race, color, religious creed, national origin, sex, gender identity, sexual orientation (which shall not include persons whose sexual orientation involves minor children as the sex object), age, genetic information, ancestry, children, marital status, veteran status or membership in the armed services, the receiving of public assistance, and handicap.

- n. To the extent that any of the foregoing sections required by Massachusetts law are inconsistent with other, non-statutory sections in this Agreement, any statutorily-mandated provisions contained herein shall control.
- o. Horizon shall not assign or subcontract in whole or in part this Agreement or in any way transfer any interest in this Agreement without the prior express written approval of the Client.
- p. This Agreement may be amended only by written consent of both parties.
- q. Horizon shall not assign any money due or to become due to Horizon unless the Client shall have received prior written notice of such assignment. No such assignment shall relieve Horizon of its obligations under this Agreement.
- r. If any provision, or portion thereof, of this Agreement shall be adjudged to be invalid or unenforceable by final judgment or order of a court of competent jurisdiction, the remaining provisions of the Agreement shall continue in effect to the extent permitted by law.
- s. The provisions of this Agreement shall be binding upon and inure to the benefit of the heirs, assigns and successors in interest of the parties.
- t. This Agreement shall be governed by and construed in accordance with the laws of the Commonwealth of Massachusetts, regardless of choice of law issues or principles.
- u. This Agreement is executed in triplicate as a sealed instrument.

(The remainder of this page is left intentionally blank.)

The Town of Natick, Massachusetts	Horizon Solutions, LLC
By: The Natick Board of Selectmen	By:
Amy K. Mistrot, Chair	Signature
Susan G. Salamoff, Vice Chair	Printed Name
Michael J. Hickey, Jr., Clerk	Printed Title
Jonathan Freedman	
Richard P. Jennett, Jr.	
Dated:	Dated:

# APPROVED AS TO AVAILABILITY OF APPROPRIATION:

In accordance with the requirements of M.G.L. Chapter 44, Section 31C, this is to certify that an appropriation in the amount of this Agreement is available therefor, and that the Natick Board of Selectmen is authorized to execute this Agreement and to approve all requisitions and execute change orders.

Arti P. Mehta Comptroller, Town of Natick

Dated:			

APPROVED AS TO FORM ONLY, AND NOT AS TO SUBSTANCE:

n							

Dated:	

Karis North, Esq.

# CERTIFICATE OF VOTE

I,(Clerk	c/Secretary)		, hereby certify		
that I am the duly	qualified and acting	(Title)	(Corporation Nan	of ne)	
	ify that at a meeting of th n meeting all Directors w				
VOTED: To aut	horize and empower eith	er		?	
(Name)	(Title)				
, (Name)		_; or			
(Name)	(Title),	_			
any of	ne acting singly, to execu	ute all contracts ar	nd bonds on behalf of t	he Corporation.	
	hat the above vote is stil l or modified in any resp		the day of	, 20	and has

Signature

Printed Name

Printed Title

The certification contained hereabove shall be executed by CONTRACTOR or copy of current "certification of authority to sign for the Corporation" shall be attached.)

#### **Exhibit A: Project Cost and Payment Terms**

Company Name:	Town of Natick
<b>Billing Address:</b>	13 East Central Street, Natick Town Hall, Natick, MA 01760

#### Purchase Order/Contract #:

<b>Project Cost:</b> Labor, Material, D Sales Tax on Mate Total Project Cost	•	\$47,847.63 N/A \$47,847.63
<i>Less: *Estimated F</i> <u>Utility</u> Eversource	Project Incentives <u>App #</u> NR180403	\$13,849.00
Total Incentives Net Project Cost 1	to Client	\$13,849.00 <b>\$33,998.63</b>

Note:

# **Project Payment Terms:**

Amount to be paid by the Client to Contractor ( <i>Payable 30 days after invoice date</i> ))	\$33,998.63
Amount to be paid by Utilities to Contractor (Contractor will collect this amount directly from the second	\$13,849.00 the Utilities)
Total Project Cost	\$47,847.6 <u>3</u>

The final invoice date will be determined by the "Certificate of Completion" as described in the Terms & Conditions.

Exhibit B: Project Proposal



# Energy Efficiency Proposal Town of Natick – Morse Library Lighting



Prepared by Tony Parente & Brandon Tibbitts Horizon Energy Services LLC 1/23/2017



# **FEATURES & SPECIFICATIONS**

**INTENDED USE** — The BLT Best-in-Value Low Profile LED luminaire features a popular center basket design that offers a clean, versatile style andvolumetric distribution. High efficacy LED light engines deliver energy savings and lowmaintenance compared to traditional sources. Anextensive selection of configurations and options make the BLT the perfect choice for many lighting applications including schools, offices and other commercial spaces, retail, hospitals and healthcare facilities. The low profile BLT design (2-3/8") also makes it an excellent choice for renovation projects.

**CONSTRUCTION** — BLT enclosure components are die-formed for dimensional consistency and painted after fabrication with a polyester powder paint for improved performance and protection.

The reflector is finished with a high reflective matte white powder paint for improved aesthetics and increased light diffusion.

End plates contain easy-to-position integral T-bar clips for securely attaching the luminaire to the T-grid. For additional T-grid security, optional screw on T-bar clips are available.

Diffusers are extruded from impact modified acrylic for increased durability. Injection molded diffuser light traps add a finished look to the diffuser ends and help seal the diffuser to the housing end plates. Optional diffuser trim rings provide an attractive mounting for integral sensors as well as adding a decorative element to the luminaire aesthetics.

LED boards are accessible from below; driver is accessible from the plenum.

**OPTICS** — Volumetric illumination is achieved by creating an optimal mix of light to walls, partitions and vertical and horizontal work surfaces – rendering the interior space, objects and occupants in a more balanced, complimentary luminous environment. High performance extruded acrylic diffusers conceal LEDs and efficiently deliver light in a volumetric distribution. Four diffuser choices available - curved and square designs with linear prisms or a smooth frosted finish.

**ELECTRICAL** — Long-life LEDs, coupled with high-efficiency drivers, provide superior quantity and quality of illumination for extended service life. 70% LED lumen maintenance at 60,000 hours (L70/60,000).

Non-Configurable BLT: 0-10 volt dimming driver. Dims to 10%

**Configurable BLT:** available in High Efficiency (HE) versions for applications where a lower wattage (over the standard product) is required. The High Efficiency versions deliver >130 LPW and can be specified via the Lumen Package designations in the Ordering Information below.

eldoLED driver options deliver choice of dimming range, and choices for control, while assuring flicker-free, low-current inrush, 89% efficiency and low EMI.

Optional integrated nLight®controls make each luminaire addressable allowing it to digitally communicate with other nLight enabled controls such as dimmers, switches, occupancy sensors and photocontrols. Connection to nLight is simple. It can be accomplished with integrated nLight AIR wireless or through standard Cat-5 cabling. nLight offers unique plug-and play convenience as devices and luminaires automatically discover each other and self-commission, while nLight AIR is commissioned easily through an intuitive model app.

Lumen Management: Unique lumenmanagementsystem (option N80) provides on board intelligence that actively manages the LED light source so that constant lumen output is maintained over the system life, preventing the energy waste created by the traditional practice of over-lighting.

Step-level dimming option allows system to be switched to 50% power for compliance with common energy

Driver disconnect provided where required to comply with US and Canadian codes.

SENSOR-- Integrated sensor (individual control): Sensor Switch MSD7ADCX (PIR)) (PDT)) (Passive infrared or MSDPDT7ADCX ((PIR/Microphonics Dual integrated Tech occupancy sensor/automatic dimming photocell allows the luminaire to power off when the space is unoccupied or enough ambient light is entering the space. See page 4 for more details on the integrated sensor.

Integrated Sensor (nLight Wired Networking): This sensor is nLightenabled, meaning it has the ability to communicate over an nLight network. When wired, using CAT-5 cabling, with other nLight-enabled sensors, power packs, or WallPods, an nLight control zone is created. Once linked to a Gateway, directly or via a Bridge, the zone becomes capable of remote status monitoring and control via SensorView software. See page 4 for the nLight sensor options.

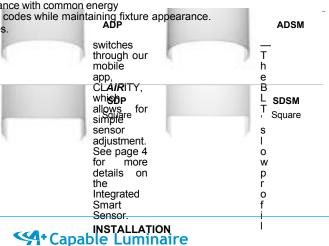
Integrated Smart Sensor (nLight Air Wireless Platform): The rES7 sensor is nLight AIR enabled, meaning it has the ability to communicate over the wireless nLight control platform. It is both a digital PIR occupancy sensor/automatic dimming photocell. It pairs to other luminaires and wall



All dimensions are inches (centimeters) unless

otherwise specified.

# **Multiple Diffuser Options**



This item is an AL canable luminaire which has had

e design of only 2-3/8" provides increased installation flexibility especially in restrictive plenum applications. The BLT fits into standard 15/16" and narrow 9/16" T-grid ceiling systems.	Curved Ribbed	Curved Smooth
Suitable for damp location. For recessed mounting in hard ceiling applications, Drywall Grid Adapters (DGA) are available as an accessory. See Accessories section. LISTINGS — CSA Certified to meet U.S. and Canadian standards. IC rated.		
DesignLights Consortium® (DLC) Premium qualified product. Not all versions of this product may be DLC Premium qualified. Please check the DLC Qualified Products List at <u>www.designlights.org/QPL</u> to confirm which versions are qualified.		
WARRANTY — 5-year limited warranty. Complete warranty terms located at <u>www.acuit</u> <u>ybrands.com/CustomerResources/Terms_and_condition</u> s.aspx		
<b>NOTE:</b> Actual performance may differ as a result of end-user environment and application. All values are design or typical values, measured under laboratory conditions at 25 °C. Specifications subject to change without notice.		

# **2BLT** Volumetric Recessed Lighting 2'x2'

A compable options indicated by this color background.

\*

	ead times will vary depending or	n options selected. Consult		Examp	le: 2BLT2 33L
3LT2					
eries Air functio	Lumens	Diffuser	Voltage	Driver	Color temperature
BLT2 2X2 (blank) BLT Static AAir supply/ return	Standard effi         High effi           (>100         effi           iency2,3         (>130           20L         2000           33L         3300           40L         4000           48LHE         4800	ADP Curved, linear prisms ADSM Curved, smooth SDP Square, linear prisms SDSM Square, smooth Bitters resplation, rings Bitters resplation, rings	(blank) MVOLT 120 120V 277 277V 347 347V₄	$\begin{array}{lll} EZ1 & eldoLED\\ dims to & 1\%\\ (0-10 \ volt \\ SLD & dimming \\ Step-\\ LE1 & level\\ dimmin\\ g_{5}\\ Lutron\\ Ecosystem\\ driver \ dims to\\ 1\%_{5,6} \\ \end{array}$	LP830 82CRI, 3000 K LP835 82CRI, 3500 K LP840 82CRI, 4000 K LP850 82CRI, 5000 K LP930 90CRI, 8P9008, SECTES, 500
ontrols	Occupancy control <sub>9</sub>		0.7	tions	
lank) No nLight® 30 nLight® with 1% lumen management 30EMG nLight® with 80 men anagement For use with enerator supply EM powe 100 nLight® without men management 100EMG nLight® withou men anagement For use with enerator supply EM powe TAIR nLight AIR enab	sensor₁0 NESPDT7 nLight™ nES dual technology integral occupancy control₁0 NES7ADCX nLight™ nES PIR integral occupancy sensor automatic dimming photoc	MSD7ADCX PIR in occupancy sensor with automa dimming control p MSDPDT7ADCX occupancy sensor automatic dimming photocell <sub>5,11</sub> <b>nLight Wireless Z</b> RES7Z nLigh with automatic dim nES PDT photocell for zone of	ntegral EL <sup>2</sup> atic BG PDT integral PW g control gau Zone gau t AIR PIR ( sensor 18 g ming control PW gau t AIR PIR ( sensor 18 g ming gau gau	14L   1400 lum     Chicago p     TD   Bodine G     vice <sub>14</sub> 'S1836     vge, 1 circuit	Generator Transfer e, 3/8" diameter, 18 e, 3/8" diameter, 18 6 PWSLV Two 8/8" diameter, a ' pre-wire, 3/8" ole and gray <sub>15</sub> e, 3/8" diameter, 18

Dellet
Pallet
<b>Qty</b> 52
52
52
52
52
52

Note

tes	6
Approximate lumen output.     All versions may not achieve 130+ LPW.     Refer to photometry on <u>www.acuitybrands.com</u> .     High efficiency performance not available in AIR     versions, 90 CRI or versions with integral sensor/trim     rings.	N o t a v a
<ul> <li>4 Not available with SLD driver, EL7L or EL14L battery packs.</li> <li>5 Not available with N80, N80EMG, N100, N100EMG, NLTAIR, or occupancy control.</li> </ul>	ı l a b l

- e with controls, occupancy controls, or PWS options. Consult factory for Hi-Lume dimming. 7 nLight EMG option requires a connection to existing nLight network. Power is provided from a separate N80 or N100 enabled fixture. 8 Must order with RES7N or RES7Z sensor. Only available with EZ1 driver.
- 9 Must specify diffuser with trim rings. See sensor options on page 4.
- Requires N80, N80EMG, N100, or N100EMG.
   Only available with EZ1 driver option. 0-10v dimming wires not accessible via access
- plate. 12 When using pre-wire option, use PWS1846. or PWS1846 PWSLV.
  - 13 Not available with N80, N80EMG, N100 or N100EMG.
- Must specify voltage. Requires BSE labeling, voltage specific. Consult factory for options.
   Not available with nLIGHT wired/wireless network or individual controls.
   Must specify voltage, 120 or 277 with GLR & GMF
  - fusing and BGTD.
    - 17 For ordering logic consult: <u>RRL\_2013</u>.

2BLT-2X2





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Rev. 10/06/16

# **2BLT** Volumetric Recessed Lighting 2'x2'

Г

Accessories: Order as separate catalog number. DGA22 Drywall grid adapter for 2x2 recessed fixture

WallPod statio	onsModel number	Occupancy sensors	Model number
On/Off		Small motion 360°, ceiling (PIR/	nCM 9 RJB / nCM PDT
On/Off &	nPODM DX	ይዘብታይፍትንtion 360°, ceiling (PIR /	ACHARO RJB / nCM PD
<b>Giap/Inv</b> ver	(PPOD) GFX	wal south with raise/lower	ANS PDT LV DX
photocenen	Moldel number	Cat-5 cable (plenum rated)	Moleël number
rantarlge	nCM ADCX RJE		CAT5 10FT J1
dimming		30' cable	CAT5 30FT J1

nLight® AIR Control Ac Order as separate catalo		brands.com/products/controls/nlightair.						
Wall switches	Modelnumber							
On/Off single pole	rPODB [color]							
On/Off two pole	rPODB 2P							
[color] On/Off & raise/lov	wer single pole							
	rPODB DX							
[color] On/Off&raise/low	color] On/Off&raise/lowertwopole							
Notes blor] On/Off & raise	e/lowefBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBB							

 $1\ \ Can only be ordered with the RES7Z zone control sensor version.$ 

Replacement Parts: Order as separate ca	talog number.
*237LJR 2DBLT24 ADP LENS ASTEMBLY 2DBLT24 SDP LENS ASTEMBLY 2DBLT24 ADSM LENS ASTEMBLY 2DBLT24 ADSM LENS ASTEMBLY 2DBLT24 SDSM LENS ASTEMBLY 2DBLT24 ADPT LENS ASTEMBLY 2DBLT24 ADSMT LENS ASTEMBLY 2DBLT24 ADSMT LENS ASTEMBLY 2DBLT24 ADSMT LENS ASTEMBLY 2DBLT24 ADPT SENSOR ASTEMBLY 2DBLT24 SDPT SENSOR	2 ft. replacement lens (light traps influteplacement lens (light traps influteplacement lens (light traps influteplacement lens (light traps influteplacement lens (trims included) 2 ft. replacement lens (trims included)
LENSASSEMELY LENSASSEMELY LENSASSEMELY	2 ft. replacement lens (trims included) 2 ft. replacement lens (trims included)

G



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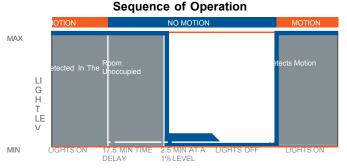
# 2BLT Volumetric Recessed Lighting 2'x2'

		0				
Option	Automatic Dimming	Occupa Separatin		nLight Wired	nLight AIR	nLight AIR
MSD7ADCX	Photocell	X		Hetworkin	Networki	Zone
MSDPDT7A		/ C	X			
DCNES7		X		X	<ul> <li>1</li> </ul>	
NES7ADCX	Х	X		X		
NESPDT7	whiled Belight	Kit	X	-XGH	Switch	
NESPDT7A	X	0.00	X	X	M DYO	
Rɧ7N	Х	Х		fur or	X	
RES7Z	Х	Х				X

#### Integrated Sensor with Individual Control

The MSD7ADCX PIR occupancy sensor/automatic dimming photocell is ideal for areas without obstructions and where daylight harvesting may be desired. Suggested applications include, but not limited to, hallways, corridors, storage rooms, and breakrooms or other areas where people are typically moving.

The MSDPDT7ADCX PIR/Microphonics Dual Tech occupancy sensor/automatic dimming photocell is ideal for areas with obstructions and where daylight harvesting is desired. Suggested applications include, but not limited to, open offices, private offices, classrooms, public restrooms, and conference rooms.

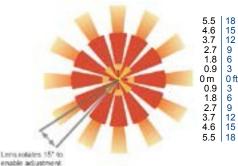


\*The presetting on the automatic dimming photocell is 5fc.

#### Sensor Coverage Pattern Mini 360° Lens

- Recommended for walking motion detection from mounting heights between 8 ft (2.44 m) and 20 ft (6.10 m)
- Initial detection of walking motion along sensor axes at
- distances of 2x the mounting height up to 15 ft (4.57 m) and  $\bullet\,1.75x\,up\,to\,20\,ft\,(6.10\,m).$ 
  - Provides 12 ft (3.66 m) radial detection of small motion when mounted at 9 ft (2.74 m)
  - Initial detection will occur earlier when walking across sensor's field of view than when walking directly at sensor

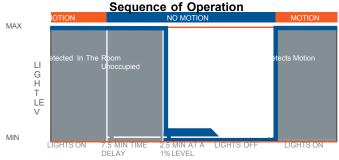
#### 9 FT Mounting



#### nLight Wired Networking

The nES 7 is ideal for small rooms without obstructions or areas with primarily walking motion. Ideal areas include hallways, corridors, storage rooms, and breakrooms. Additionally, the NES7ADCX includes an integrated photocell, which enables daylight harvesting controls.

For areas like restrooms, private offices, open offices, conference rooms or any space with obstructions, the nES PDT 7 dual technology sensor is recommended. The nES PDT 7 utilizes both PIR (passive infrared) and Microphonics technologies to detect occupancy. Additionally, the NESPDT7ADCX includes an integrated photocell, which enables daylight harvesting controls which is ideal for areas where windows are present.



\*The presetting on the automatic dimming photocell is 5fc.

#### nLight AIR Wireless

nLight AIR is the ideal solution for retrofit or new construction spaces where adding additional wiring can be labor intensive and costly. The integrated rES 7 smart sensor is part of each luminaire in the nLight AIR network, which can be grouped to control multiple luminaires. The granularity of control with the digital PIR occupancy detection and daylight sensing makes a great solution for any application.



#### Simple as 1,2,3

EI (

- 1. Install the <code>nLight\_</code> AIR fixtures with embedded smart sensor
- 2. Install the wireless battery-powered wall switch
- With CLAIRITY app, pair the fixtures with the wall switch and if desired, customize the sensor settings for the desired outcome





nLightAIR rPODB 2P DX

Mobile Device

Ν

#### Basic nLight Zone





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Rev. 10/06/16

2BLT-2X2

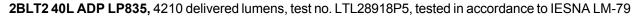
# 2BLT Volumetric Recessed Lighting 2'x2'

# PHOTOMETRICS

180°

2BLT2 33L ADP LP835, 3241 delivered lumens, test no. LTL28918P4, tested in accordance to IESNA LM-79

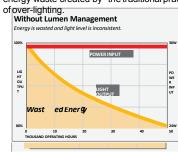
		1-1	1					c	oef	ficien	ts of I	Utiliz	ation							
	A T	1	000	CP S	ummar	y pf						20	%				Zonal Lu	men Sum	mary	
			90			рс			80				)%		50	%				
80°	AC SUM	$T \rightarrow$			0°	90	_pw	70%	50%	30%	50%3	30% <sup>.</sup>	10%	50%3	0%10	)%	Zone	Lumen	s % Lamp	% Fixture
200		7	0'	° 1	114	1114	0	119 11	9 11	9	116	116	116	111	111	111	0° - 30°	852	26.3	26.3
	HHYX	[ ]	60	5°	1092	1118	1	108 1	03	98	100	96	92	96	92	89	0° - 40°	1385	42.7	42.7
400		$\mathbb{N}$	-	15°	1042	1075	2	98	89	82	87	80	75	83	78	73	0° - 60°	2440	75.3	75.3
	HTID	$I \sim$		25°	943	996	3	89	78	69	76	68	62	73	66	61	0° - 90°	3242	100.0	100.0
600	112	$\wedge$		35°	808	891	4 <sub>D</sub>	81	69	60	67	59	52	65	57	52	90° - 180°	0	0.0	0.0
	HTY	'X		45°	653	770	<sup>4</sup> R 5C	75	61	52	60	52	45	58	50	44	0° - 180°	3242	100.0	100.0
800		$< \vee$	ľ	55°	492	638	6	69	55	46	54	46	39	52	45	39				
		$\sim$	40	65°	334	501	7	64	50	41	49	41	35	48	40	34				
1000		イ		75°	177	359	8	59	46	37	45	37	31	44	36	31				
0°	20°			85°	44	147	9	56	42	34	41	33	28	40	33	28				
0				90	5	2	10	52	39	31	38	30	25	37	30	25				
	0°	90°																		

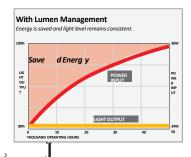


180°								Coef	ficien	nts of	Utili:	zation	ı I						
	WXX	A	90			pf					209	6							
	4 F F F		° CP S	ummar	y	рс		80	%		70	%		50	%	Zonal	Lumen Sı	immary	
80°				0°	90	рм	/ 70%	50%	30%	50%	30%1	0%	50%3	0%10	0%	Zone	Lumer	is % Lam	p % Fixture
200	HIXX	7-	0° 14	47	1447	0	119 11	9 11	9	116	6116	116	111	111	111	0° - 30°	1107	26.3	26.3
400	THX XV	$\prec$	5° 14	19	1452	1	108 10	3 9	В	100	96	92	96	92	89	0° - 40°	1799	42.7	42.7
	TITY X	$\times$	60 15°	1354	1396	2	98	89	82	87	80	75	83	78	73	0° - 60°	3169	75.3	75.3
600	HIVIN	$( \times$	° 25°	1224	1294	3	89	78	69	76	68	62	73	66	61	0° - 90°	4211	100.0	100.0
800	HTX	Х	35°	1050	1158	ŧ	81	69	60	67	59	52	65	57	52	90° - 180°	0	0.0	0.0
1000	LIVA	$\langle \rangle$	45°	849	1001	5 <sup>C</sup>	75 6	15	26	50 52	2 45	5 5	8 50	44		0° - 180°	4211	100.0	100.0
1000		$\times$	55°	640	829	6	69	55	46	54	46	39	52	45	39				
1200	HXX		65°	434	650	7	64	50	41	49	41	35	48	40	34				
1400	Later )	< 1	<sup>10°</sup> 75°	230	466	8	59	46	37	45	37	31	44	36					
			85°	57	191	9	56	42	34	41	33	28	40	33					
	20°		90	7	3	10	52	39	31	38	30	25	37	30	25				
	0°	0°																	

# Constant Lumen Manageme

Enabled by the embedded nLight control, the BLT actively tracks its run-time and manages its light source such that constant lumen output is maintained over the system life. Referred to as lumen management, this feature eliminates the energy waste created by the traditional practice of over-lighting





<b>p</b> *			
	erforma	nce Data	
Lumen Package	Lumens	Input Watts	LPW
20L ADP LP830	2157	20	110
20L ADP LP835	2213	20	113
20L ADP LP840	2261	20	116
20L ADP LP850	2373	20	121
33L ADP LP830	3160	30	106
33L ADP LP835	3241	30	108
33L ADP LP840	3313	30	111
33L ADP LP850	3476	30	116
40L ADP LP830	4103	39	106
40L ADP LP835	4209	39	108
40L ADP LP840	4302	39	111
40L ADP LP850	4514	39	116
AIR 20L ADP	2019	20	103
APP 20L ADP	2060	20	105
AR 20LADP	2116	20	108
APP 20L ADP	2134	20	109
AR€59LADP	2957	28	104
APP 39LADP	3017	28	107
A¶≹353LADP	3099	28	109
AR 39LADP	3126	28	110
AR 40LADP	3841	39	99
AR€40LADP	3919	39	101
AR 45 LADP	4025	39	104
AR 40LADP	4060	39	104

HE Performar	nce Data		
Lumen Package	Lumens	Input Watts	LPW
33LHE ADP	3537	28	126
588A ADP	3628	28	130
586AE ADP	3708	28	132
SBANE ADP	3708	28	139
40841E ADP	4118	32	127
40899E ADP	4224	32	131
4089E ADP	4317	32	134
40841E ADP	4530	32	140
488AAE ADP	4699	37	128
488ABE ADP	4820	37	131
488AE ADP	4927	37	134
48844 ADP	5169	37	140

Ceiling Type	Appropriat e Trim
Exposed	Туре
grid tee (1'	G
and 9/16") Concealed grid tee	G
Plaster or	G*
plasterboard 9/16	15/16

Screw Slot

\*DGA accessory available to provide ceiling trim flange and fixture support for plaster or plasterboard ceiling. Recommended rough-in dimensions for DGA installation is 24-3/4" x 24-3/4" (Tolerance is +1/8", -0").

TH CNLIASTIN An **Cuity**Brands Company



2BLT-2X2

LED: One Lithonia Way Conyers, GA 30012

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Rev. 10/06/16



# **FEATURES & SPECIFICATIONS**

INTENDEDUSE — The 2GTLLED recessed troffer offers awide range of lumen packages, color temperatures, and lens options to meet the lighting needs for a wide range of applications such as schools, offices, and hospitals. The light engine delivers long life and excellent color to ensure a sound quality, low-maintenance lighting installation. Certain airborne contaminants can diminish integrity of acrylic. Click here for Acrylic Environmental Compatibility table for suitable uses.

CONSTRUCTION - Housing formed from 22 gauge cold-rolled steel. Smooth hemmed sides and smooth inward formed end flanges for safe handling. Lighterweight fixture allows for safe, easy installation.

OPTICS - Highly transmissive pattern #12 lens diffuses the light source without compromising output. Pattern #19 and satin white lens options also available.

ELECTRICAL - Long-life LEDs, coupled with high-efficiency drivers, provide extended service life. 90%

LED lumen maintenance at 60,000 hours (L90/60,000).

eldoLED driver options deliver choice of dimming range, and choices for control, while assuring flicker-free, low-current inrush, 89% efficiency and low EMI.

Optional nLight® embedded controls make each luminaire addressable - allowing it to digitally communicate with other nLight enabled controls such as dimmers, switches, occupancy sensors and photocontrols. Simply connect all the nLight enabled control devices and the GTL luminaires using standard Cat-5 cabling. Unique plug-and-play convenience as devices and luminaires automatically discover each other and selfcommission.

Lumen Management: Unique lumen management system (option N80) provides onboard intelligence that actively manages the LED light source so that constant lumen output is maintained over the system life, preventing the energy waste created by the traditional practice of over-lighting.

The step-level dimming option (SLD) allows the system to be switched to 50% power for compliance with common energy codes while maintaining fixture appearance.

Ballast disconnect is provided where required to comply with U.S. and Canadian codes.

**INSTALLATION** — LED boards include plug-in connectors for easy of upgradeability. Suitable for direct

insulation contact.

LISTINGS — CSA certified to meet U.S. and Canadian standards. IC rated. DesignLights Consortium® (DLC) qualified product. Not all versions of this product may be DLC Actual performance may differ as a result of end-user qualified. Please check the DLC Qualified Products List at w w environment and application. Note: Specifi ations subject to w.designlights.org/QPL to confirm which versions are qualified.



All dimensions are inches (centimeters) unless otherwise indicated.

WARRANTY — 5-year limited warranty. Complete warranty terms located at www.acuitybrands.com/CustomerResources/Terms\_and\_conditions.aspx

change without notice.

#### ORDERING INFORMATIC Lead times will vary depending on options selected. Consult

2GTL								
Series	Length	Trim type	Lumens1	Door	Lens	Voltage	Driver	Color
2GTL 2' wide recessed LED luminaire		F Overlapping	lumens 40L 4000 lumens	FN Flush aluminum, natural FM Flush aluminum, matte	pattern acrylic, 0.125" thick A19 #19	120         120V           277         277V           347         347V <sub>2</sub>	EZ1 eldoLED dims to 1 % SLD Step- level dimming <sub>3</sub> EXA1 eldoLED dims to 1%, XPoint wireless enabled	temperature LP830 3000 K LP835 3500 K LP840 4000 K LP850 5000 K

#### Example: 2GTL 2 33L EZ1

1

LED 2X2

# 2GTL LED Troffer

Pe	erformance D	ata	
Lumen Package	Input Watts	Lumens	LPW
20L LP830	19.6	1981.2	101.08
20L LP835	19.6	2080.3	106.14
20L LP840	19.6	2179.4	111.19
20L LP850	19.6	2215	113.01
33L LP830	35.4	3300.7	93.24
33L LP835	35.4	3453.3	97.55
33L LP840	35.4	3619.7	102.25
33L LP850	35.4	3645.5	102.98
40L LP830	39.6	3530.6	89.16
40L LP835	39.6	3704.9	93.56
40L LP840	39.6	3883.2	98.06
40L LP850	39.6	3994.2	100.86

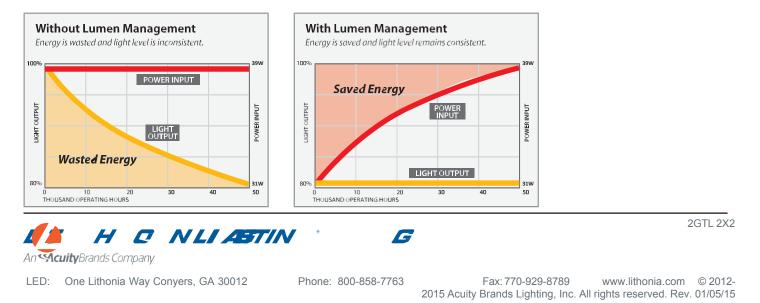
# PHOTOMETRICS

2GTL2 33L EZ1 LP835, 3453 delivered lumens, test no. LTL26153P5, tested in accordance to IESNA LM-79.

180° **Coefficients of Utilization** pf 20% **CP** Summary Zonal Lumen Summary 90° 80% 70% 50% рс Lumens % Lamp % Fixture 0° Zone 90 80° pw 70%50%30% 50%30%10% 50%30%10% 0° 1518 0 119 119 119 32.9 1518 116 116 116 111 111 111 0° - 30° 1136 32.9 300 1515 1504 1 109 105 101 103 99 96 99 96 93 0° - 40° 1799 52.1 52.1 5° 15° 1433 1434 2 100 93 86 91 85 80 87 82 78 0° - 60° 2889 83.6 83.6 600 25° 1274 1295 3 92 82 75 81 74 68 78 72 67 0° - 90° 3454 100.0 100.0 90° - 180° 900 85 74 65 72 64 59 70 63 58 0 0.0 35° 1056 1081  $^{4}$ R 0.0 78 0° - 180° 100.0 100.0 45° 795 5<sub>C</sub> 66 58 65 57 51 63 56 51 3454 809 55° 540 530 6-73 60 51 59 51 45 57 50 45 1200 65° 328 314 7 68 55 46 54 46 40 52 45 40 75° 176 180 8 63 50 42 49 42 36 48 41 36 1500 0° 20° 9 59 46 38 46 38 33 45 38 33 85° 61 63 56 35 30 35 30 90 5 10 43 35 42 41 3 90° 0°

#### **Constant Lumen Management**

Enabled by the embedded nLight control, the GTL actively tracks its run-time and manages its light source such that constant lumen output is maintained over the system life. Referred to as lumen management, this feature eliminates the energy waste created by the traditional practice of over-lighting.



HES - Executive Summary					
	ORIZON OLUTIONS				
Overall System Investment:					
Total Project Investment:	\$99,748.88				
Total Cost Investment:	\$99,748.88				
Project Incentives: (Electric)	<u>\$16,546.53</u>				
Total Net Cost Investment:	\$83,202.35				

# Pricing guaranteed for 45 days from date of proposal

Value Analysis:					
Annual Energy Savings: Monthly Energy Savings: <b>Simple Payback Period (Years):</b>	\$11,251.64 \$937.64 7.39				
Maintenan	ce Savings				
*** Estimated Annual Maintenance Savings: <b>Total Annual Operational Savings:</b> * Sales Tax is on Materials Only	\$922.63 \$12,174.27				

\* Sales Tax is on Materials Only.

\*\*\* Maintenance Savings is Estimated and therefore is not used to calculate payback.



# Town of Natick Energy Efficiency Proposal

Location:

Morse Library

Monday, January 23, 2017

Natick, MA

kWh Rate: Primary Contact: Phone:

Jillian Wilson-Martin 508-647-6555 \$

#### 0.17

Measure Description				Project Cost \$	Project Elec Incentives	Project NET Cost \$	Estimated ROI
Lighting Upgrades	17.91	66,186	\$11,251.64	\$99,748.88	\$16,546.53	\$83,202.35	7.39
TOTALS	17.91	66,186	\$11,251.64	\$99,748.88	\$16,546.53	\$83,202.35	7.39

#### **Measure Description**

Existing fixtures- The existing fixtures in the common areas are 2L 4ft, 3L 4ft and 4L 8ft indirect/direct hanging fixtures w/F32T8 lamps that Horizon proposes to retrofit with Everline LED tube and LED driver kit. Main and back areas also have 2L 2X2 Parabolic w/FBO31T8 lamps that Horizon proposes to replace with Lithonia 20w LED BLT fixtures w/ intergrated controls. Restrooms have 1L 3ft and 1L 4ft strips that Horizon proposes to retro-fit with Everline LED tube and LED driver kits. Exterior fixtures are 150w MH wallpacks that Horizon proposes to replace with RAB SLIM26 and 250w MH flood fixtures that Horizon proposes to replace with RAB 78w flood fixture.

### **Next Steps**

Develop final project grade proposal for lighting. Confirm applicable EverSource.

Confirm owner project approval and execute contract documents

Preliminary estimate for budgeting purposes only

HES - Environmental Impact	

#### **Town of Natick**

# Environmental Impact

Although it appears innocuous, lighting causes air pollution. Each day, your local power plant will commonly burn coal, oil, and gas to generate electricity for your lighting system as well as for your other electrical needs. While burning these fossil fuels produces a readily available and instantaneous supply of electricity, it also generates air pollutants: carbon dioxide (CO2), sulfur dioxide (SO2), and nitrogen oxides (NOx).

### Air pollution causes global warming, acid rain, and smog.

Each of these pollutants causes environmental damage. Carbon dioxide (CO2) causes global warming, sulfur dioxide (SO2) causes acid rain, and nitrogen oxides (NOx) cause both acid rain and smog.

# Your project will help to decrease air pollution and environmental damage by the following amounts each year:



Removing	59,568	pounds of Carbon Dioxide*
Removing	165,465	grams of Sulfur Dioxide
Removing	383,879	grams of Nitrogen Oxides

# By removing these quantities of pollutants from the air, your project will have the same affect on the environment as:



Planting	15	acres of trees
Removing	9	cars from the road each year or
Saving	6,017	gallons of gasoline each year

Source: U.S. Environmental Protection Agency <u>http://www.epa.gov/climatechange/</u> \*Carbon Dioxide calculation has been modified from EPA calculation to properly reflect the New England power grid

# **HES - Savings Projections (Lighting)**

#### **Town of Natick**

		Existing	Conditions		
Total #		Pre Annual	Pre	Pre Annual	Total Lighting
of Fixtures/Actions	Pre KW	Demand Charge	Annual KWH	KWH Charge	Cost \$\$
451	35.37	\$0.00	122,871	\$20,888.13	\$20,888.13

		Propose	d Lighting		
Total #		Post Annual	Post	Post Annual	Total Lighting
of Fixtures/Actions Post KW		Demand Charge	Annual Kwh	KWH Charge	Cost \$\$
451	17.46	\$0.00	56,685	\$9,636.49	\$9,636.49

Demand Savings					
KW Demand	Monthly	Annual			
Savings	Cost Savings	Cost Savings			
17.91	\$0.00	\$0.00			

KWH Savings					
Annual KWH	Monthly	Annual			
Savings	Cost Savings	Cost Savings			
66,186	\$937.64	\$11,251.64			

Total Cost Savings		
Monthly Annual		
Cost Savings	Cost Savings	
\$937.64	\$11,251.64	

Calculated Electric Rate Avg KWh. Cost \$0.1700 Demand Cost \$0.000

53.87% Reduction in total lighting cost

#### Town of Natick Lighting Worksheet Auditor: Brandon Tibbetts

Sort	SITE LOCATION	Fir	EXISTING	PRODUCT	QTY	E-Watts	Total KW		kWh Pre	ANNUAL COST	PROPOSED	QTY	P-watts Prop RunHRS	тот кw	kWh Post	% Sen saving	Total Post-KWH	ANNUAL COST (PROPOSED)
				E-Code							PROPOSED	QTY						(**********
1	Atrium		1L flood w/175w MH	1M0175S	6	205	1.23	8760	10,775	\$1,831.72	NEW/RAB/FFLED39/T	6	418,760	0.25	2,155	09	62,155	\$ 366.34
2	Community room	Base	2L 2X2 Parabolic w/FBO31	2F32SSE	4	60	0.24	2080	499	\$84.86	NEW/2X2/LED/20W/BLT	4	20 1,456	0.08	116	30%	1	-
3	Open area		2L 2X2 Parabolic w/FBO31	2F32SSE	20		1.20	3276	3.931	\$668.30	NEW/2X2/LED/20W/BLT	20	20 3.276	0.40	1,310	09	61.310	\$ 222.77
4	Meeting Hall		2L 4ft Indirect/Direct w/F32T8	2F32SSE	6	-	0.36	2080	749	\$127.30	RB/2L/4FT/LED/TUBE/36W	6	36 2.080	0.22	449	09	6 4	
5	Meeting Hall		4L 8ft Indirect/Direct w/F32T8	4F32SSE	6	112	0.67	2080	1.398	\$237.62	RB/4L/4FT/LED/TUBE/70W	6	70 2.080	0.42	874	09	6 8	
6	Back corridor		2L 2X2 Parabolic w/FBO31	2F32SSE	6		0.36	3276	1,000	\$200.49	NEW/2X2/LED/20W/BLT	6	20 3.276	0.12	393	09	6 39	
7	Archive		2L 4ft industrial w/F32T8	2F32SSE	6		0.36	1040	374	\$63.65	RB/2L/4FT/LED/TUBE/36W	6	36 1.040	0.22	225	09	6 2	-
, o	Mens RR		1L 3ft strip w/F25T8	1F25SSE	4	-	0.10	2080	200	\$33.95	RB/1L/3FT/LED/TUBE/11W	4	11 2,080	0.04	92	09		2 \$ 15.56
0	Mens RR	Base	1L 4ft strip w/F32T8	1F32SSE	5		0.15	2080	312	\$53.04	RB/1L/4FT/LED/TUBE/18W	5	18 2,080	0.04	187	09	6 18	-
9 10	Womens RR	Base	1L 3ft strip w/F25T8	1F25SSE	4		0.10	2080	200	\$33.95	RB/1L/3FT/LED/TUBE/11W	4	11 2.080	0.03	92	09		2 \$ 15.56
10	Womens RR		1L 4ft strip w/F32T8	1F32SSE	5		0.15	2080	312	\$53.04	RB/1L/4FT/LED/TUBE/18W	5	18 2,080	0.04	187	09	6 18	-
12	Display cases	Base	1L 4ft strip w/F32T8	1F32SSE	2		0.15	3276	197	\$33.42	RB/1L/4FT/LED/TUBE/18W	2	18 3,276	0.09	118	09	6 10	
	Lights over magazine rack	Base	4L 8ft wrap w/F32T8	4F32SSE	1	30 112	0.11	3276	197 367	\$33.42 \$62.38	RB/4L/4FT/LED/TUBE/70W	1		0.04	229	09		
13	Childrens room		2L 2X2 Parabolic w/FBO31	2F32SSE	39		0.11	3276	367 7.666	\$62.38 \$1.303.19	NEW/2X2/LED/20W/SATIN/LITH	39	70 3,276 20 3,276	0.07	2.555		6 2: 62.555	9 \$ 38.98 \$ 434.40
	Story hour room	Base	2L 2X2 Parabolic w/FBO31 2L 2X2 Parabolic w/FBO31	2F3255E	10		0.60	2080	1,000	\$1,303.19 \$212.16	NEW/2X2/LED/20W/JATIN/LITT	10		0.78	2,555	30%	,	*
15				4F32SSE	5			3276	1 .			5	20 1,456				2	-
16	Lights under skylights Childrens office	Base Base	4L 8ft grated strip w/F32T8 2L 2X2 Parabolic w/FBO31	4F3255E 2F3255E	8	112	0.56	2080	1,835	\$311.88	RB/4L/4FT/LED/TUBE/70W NEW/2X2/LED/20W/BLT	8	70 3,276	0.35	1,147	09	61,147	\$ 194.92
17	Childrens office RR		2L 2X2 Parabolic W/FBO31 2L 2X2 Parabolic w/FBO31	2F32SSE 2F32SSE	8			2080 1040	998	\$169.73	NEW/2X2/LED/20W/BLT	8	20 1,456	0.16	233	30%	23	
18				2F3255E 2F3255E	3		0.06	2080	62	\$10.61		3	20 728	0.02		30%		5 \$ 2.48
19	Restrooms		2L 2X2 Parabolic w/FBO31	-			0.18		374	\$63.65	NEW/2X2/LED/20W/BLT		20 1,456	0.06	87			7 \$ 14.85
20	Main Area		2L 4ft Indirect/Direct w/F32T8	2F32SSE	11		0.66	3276	2,162	\$367.57	RB/2L/4FT/LED/TUBE/36W	11	36 3,276	0.40	1,297		61,297	\$ 220.54
21	Main Area	1st	4L 8ft Indirect/Direct w/F32T8	4F32SSE	42	112	4.70	3276	15,410	\$2,619.75	RB/4L/4FT/LED/TUBE/70W	42	70 3,276	2.94	9,631		69,631	\$ 1,637.34
22	Main Area		3L 4ft Indirect/Direct w/F32T8	3F32SSE	34	-	32.99	3276	9,802	\$1,666.30	RB/3L/4FT/LED/TUBE/52W	34	52 3,276	1.77	5,792	09	5,792	\$ 984.63
23	Office staff area		2L 2X2 Parabolic w/FBO31	2F32SSE	20	-	1.20	3276	3,931	\$668.30	NEW/2X2/LED/20W/BLT	20	20 3,276	0.40	1,310	09	61,310	\$ 222.77
24	Trustees room	1st	4L 8ft Indirect/Direct w/F32T8	4F32SSE	1	112	0.11	2080	233	\$39.60	RB/4L/4FT/LED/TUBE/70W	1	702,080	0.07	146	09	6 14	
25	Rm 121		2L 2X2 Parabolic w/FBO31	2F32SSE	2		0.12	2080	250	\$42.43	NEW/2X2/LED/20W/BLT	2	201,456	0.04	-	30%		8 \$ 9.90
26	Rm 122		2L 2X2 Parabolic w/FBO31	2F32SSE	2		0.12	2080	250	\$42.43	NEW/2X2/LED/20W/BLT	2	201,456	0.04		30%		8 \$ 9.90
27	Rm 123	1st	2L 2X2 Parabolic w/FBO31	2F32SSE	1	60	0.06	2080	125	\$21.22	NEW/2X2/LED/20W/BLT	1	201,456	0.02	29	30%		9 \$ 4.95
28	Rm 126		2L 2X2 Parabolic w/FBO31	2F32SSE	4	60	0.24	2080	499	\$84.86	NEW/2X2/LED/20W/BLT	4	201,456	80.0	116	30%	1	6 \$ 19.80
29	Book mobile workroom		2L 2X2 Parabolic w/FBO31	2F32SSE	10		0.60	3276	1,966	\$334.15	NEW/2X2/LED/20W/BLT	10	202,293	0.20	459	30%	4	-
30	Closet	1st	2L 4ft wrap w/F32T8	2F32SSE	1	60	0.06	520	31	\$5.30	RB/2L/4FT/LED/TUBE/36W	1	36 520	0.04	19	09	6	9 \$ 3.18
31	Garage area	1st	2L 4ft industrial w/F32T8	2F32SSE	7	60	0.42	3276	1,376	\$233.91	RB/2L/4FT/LED/TUBE/36W	7	36 3,276	0.25	826	09	6 83	6 \$ 140.34
32	Main Area	2nd	2L 4ft Indirect/Direct w/F32T8	2F32SSE	10	60	0.60	3276	1,966	\$334.15	RB/2L/4FT/LED/TUBE/36W	10	36 3,276	0.36	1,179	09	61,179	\$ 200.49
33	Main Area	2nd	4L 8ft Indirect/Direct w/F32T8	4F32SSE	40	112	4.48	3276	14,676	\$2,495.00	RB/4L/4FT/LED/TUBE/70W	40	70 3,276	2.80	9,173	09	69,173	\$ 1,559.38
34	Main Area	2nd	3L 4ft Indirect/Direct w/F32T8	3F32SSE	34	88	32.99	3276	9,802	\$1,666.30	RB/3L/4FT/LED/TUBE/52W	34	52 3,276	1.77	5,792	09	5,792	\$ 984.63
35	RR 2A	2nd	1L 4ft strip w/F32T8	1F32SSE	2	30	0.06	2080	125	\$21.22	RB/1L/4FT/LED/TUBE/18W	2	18 2,080	0.04	75	09	6	5 \$ 12.73
36	RR2B	2nd	1L 4ft strip w/F32T8	1F32SSE	2	30	0.06	2080	125	\$21.22	RB/1L/4FT/LED/TUBE/18W	2	18 2,080	0.04	75	09	6	5 \$ 12.73
37	Teen room	2nd	4L 8ft Indirect/Direct w/F32T8	4F32SSE	6	112	0.67	3276	2,201	\$374.25	RB/4L/4FT/LED/TUBE/70W	6	70 3,276	0.42	1,376	09	61,376	\$ 233.91
38	Teen room		2L 2X2 Parabolic w/FBO31	2F32SSE	5	60	0.30	3276	983	\$167.08	NEW/2X2/LED/20W/BLT	5	20 3,276	0.10	328	09	6 3:	8 \$ 55.69
39	Staff area	2nd	2L 2X2 Parabolic w/FBO31	2F32SSE	28	60	1.68	3276	5,504	\$935.63	NEW/2X2/LED/20W/BLT	28	20 3,276	0.56	1,835	09	61,835	\$ 311.88
40	Staff area	2nd	4L 8ft Indirect/Direct w/F32T8	4F32SSE	1	112	0.11	3276	367	\$62.38	RB/4L/4FT/LED/TUBE/70W	1	70 3,276	0.07	229	09	6 23	9 \$ 38.98
41	Staff area	2nd	4L 6ft wallwash w/F25T8	4F25SSE	6	88	80.53	3276	1,730	\$294.05	RB/4L/3FT/LED/TUBE/44W	6	44 3,276	0.26	865	09	6 81	5 \$ 147.03
42	Computer room	2nd	2L 2X2 Parabolic w/FBO31	2F32SSE	4	60	0.24	2080	499	\$84.86	NEW/2X2/LED/20W/BLT	4	20 1,456	0.08	116	30%	1	6 \$ 19.80
43	Study/conf room	2nd	2L 2X2 Parabolic w/FBO31	2F32SSE	6	60	0.36	3276	1,179	\$200.49	NEW/2X2/LED/20W/BLT	6	20 2,293	0.12	275	30%	2	5 \$ 46.78
44	Mens RR	2nd	1L 4ft strip w/F32T8	1F32SSE	2	30	0.06	2080	125	\$21.22	RB/1L/4FT/LED/TUBE/18W	2	18 2,080	0.04	75	09	6	5 \$ 12.73
45	Womens RR	2nd	1L 4ft strip w/F32T8	1F32SSE	2	30	0.06	2080	125	\$21.22	RB/1L/4FT/LED/TUBE/18W	2	18 2,080	0.04	75	09	6	5 \$ 12.73
	Staff lounge	2nd	4L 6ft wallwash w/F25T8	4F25SSE	6	88	30.53	3276	1,730	\$294.05	RB/4L/3FT/LED/TUBE/44W	6	44 3,276	0.26	865	09	6 81	
47	Staff lounge	2nd	4L 8ft Indirect/Direct w/F32T8	4F32SSE	1	112	0.11	3276	367	\$62.38	RB/4L/4FT/LED/TUBE/70W	1	70 3,276	0.07	229	09	6 23	9 \$ 38.98
48	Stairwell	2nd	2L 4ft strip w/F32T8	2F32SSE	4	60	0.24	8760	2,102	\$357.41	NEW/STR4/BI-LEV/20W-2W/LITHONIA	4	20 6,132	0.08	491	30%	49	1 \$ 83.40
49	Stairwell #1	2nd	2L 4ft strip w/F32T8	2F32SSE	6	60	0.36	8760	3,154	\$536.11	NEW/STR4/BI-LEV/20W-2W/LITHONIA	6	20 8,760	0.12	1,051	09	61,051	\$ 178.70
50	Stairwell #2	2nd	2L 4ft strip w/F32T8	2F32SSE	6	60	0.36	8760	3,154	\$536.11	NEW/STR4/BI-LEV/20W-2W/LITHONIA	6	20 8,760	0.12	1,051	09	61,051	\$ 178.70
51	Exterior		1L wallpack w/150w MH	1M0150S	2	190	0.38	4380	1,664	\$282.95	NEW/RAB/SLIM37/PC	2	374,380	0.07	324	09	6 3:	4 \$ 55.10
51	Exterior		1L flood w/250w MH	1M0250S	2	295	0.59	4380	2,584	\$439.31	NEW/RAB/FXLED78/PCS/SF	2	814,380	0.16	710	09	6 7	
~					451		35.37		122,871	\$20,888.13		451		17.46	56,685		56,685	\$ 9,636.49

Annual Savings:	\$ 11,251.64
kW Reduced:	17.91
kWh Savings:	66,186

# FFLED39T

Rectangular shaped LED floodlight designed to replace 150W Metal Halide. Patent Pending airflow technology ensures long LED and driver lifespan. Use for building facade lighting, sign lighting, LED landscape lighting and instant-on security lighting. Color: Bronze



Weight: 12.5 lbs

Created: 01/23/2015

Heavy-duty Trunnion mount with stainless steel hardware.

#### **Driver Info** LED Info Type: **Constant Current** Watts: 39W 120V: 0.35A 5000K (Cool) Color Temp: 208V: 0.20A Color Accuracy: 65 240V<sup>.</sup> 0.18A L70 Lifespan: 100000 277V: 0.15A LM79 Lumens: 4596 41W Input Watts: Efficacy: 112 LPW Efficiency: 95%

# **Technical Specifications**

**UL Listing:** Suitable For Wet Locations. Suitable for ground mounting.

### Lumen Maintenance:

100,000-hour LED lifespan based on IES LM-80 results and TM-21 calculations.

**IP Rating:** Ingress Protection rating of IP65 for dust and water.

**NEMA Type:** 7H x 6V Beam Spread.

LEDs: Two multi-chip, 26Watt high performance LEDs.

### Driver:

Constant Current, Class 2, 1050mA, 100-277V, 50/60Hz, 0.6A, Power Factor 99%

**THD:** 7.7% at 120V, 6.8% at 277V

Surge Protection: 4kV

**Ambient Temperature:** Suitable for use in 40°C ambient temperatures.

**Cold Weather Starting:** The minimum starting temperature is -40°F/-40°C.

Thermal Management Housing: Superior heat sinking with external Air-Flow fins.

# Mounting:

#### Color Consistency:

7-step MacAdam Ellipse binning to achieve consistent fixture-to-fixture color.

#### **Color Stability:**

LED color temperature is warrantied to shift no more than 200K in CCT over a 5 year period.

#### **Color Uniformity:**

RAB's range of CCT (Correlated Color Temperature) follows the guidelines of the American National Standard for (SSL) Products, ANSI C78.377-2008.

#### Equivalency:

The FFLED39 is Equivalent in delivered lumens to a 150W Metal Halide.

#### **Effective Projected Area:**

EPA = 0.65

**Reflector:** Specular vacuum-metallized polycarbonate

#### Gaskets:

High-temperature silicone gaskets.

#### Finish:

Our environmentally friendly polyester powder coatings are formulated for high-durability and long-lasting color, and contains no VOC or toxic heavy metals.

Green Technology:

Mercury and UV free.

#### IESNA LM-79 & LM-80 Testing:

RAB LED luminaires have been tested by an independent laboratory in accordance with IESNA LM-79 and LM-80, and have received the Department of Energy Lighting Facts label.



Email: sales@rabweb.com On the web at: www.rabweb.com Note: Specifications are subject to change without notice

Page 1 of 2

FFLED39T - continued

#### California Title 24:

Select an FFLED39 model equipped with 0-10V driver (look for /D10 in the catalog #) for a 2013 California Title 24 compliant model.

#### Warranty:

RAB warrants that our LED products will be free from defects in materials and workmanship for a period of five (5) years from the date of delivery to the end user, including coverage of light output, color stability, driver performance and fixture finish.

#### Patents:

The FFLED design is protected by U.S. Pat. D643,147, Canada Pat. 140798, China Pat. ZL201130171304.1, Mexico Pat. 36757 and pending patent in Taiwan.

#### Threaded Size:

1/2" threaded arm.

#### **DLC Listed:**

This product is on the Design Lights Consortium (DLC) Qualified Products List and is eligible for rebates from DLC Member Utilities.

#### **Country of Origin:**

Designed by RAB in New Jersey and assembled in the USA by RAB's IBEW Local 3 workers.

#### **Buy American Act Compliant:**

This product is a COTS item manufactured in the United States, and is compliant with the Buy American Act.

#### **Recovery Act (ARRA) Compliant:**

This product complies with the 52.225-21 "Required Use of American Iron, Steel, and Manufactured Goods-- Buy American Act-- Construction Materials (October 2010).

#### Trade Agreements Act Compliant:

This product is a COTS item manufactured in the United States, and is compliant with the Trade Agreements Act.

#### GSA Schedule:

Suitable in accordance with FAR Subpart 25.4.

Created: 01/23/2015



Email: sales@rabweb.com On the web at: www.rabweb.com Note: Specifications are subject to change without notice

Page 2 of 2

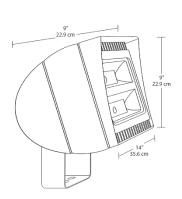
# FXLED78T

High power, wide distribution LED floodlight. Replaces 250W MH. Patent Pending airflow technology ensures long LED and driver lifespan. Use for building facade lighting, sign lighting, LED landscape lighting and instant-on security lighting.

LED Info		<b>Driver Info</b>	
Watts:	78W	Type:	Constant Current
Color Temp:	5100K (Cool)	120V:	0.66A
Color Accuracy:	67	208V:	0.41A
L70 Lifespan:	100000	240V:	0.35A
LM79 Lumens:	7597	277V:	0.30A
Efficacy:	97 LPW	Input Watts:	79W
· · · · <b>)</b>		Efficiency:	99%

Color: Bronze





Weight: 24.0 lbs

The minimum starting temperature is -40°F/-40°C.

# **Technical Specifications**

#### **UL Listing:**

Suitable for wet locations. Suitable for ground mounting.

#### Lifepsan:

100,000-hour LED lifespan based on IES LM-80 results and TM-21 calculations.

#### **IP Rating:**

Ingress Protection rating of IP66 for dust and water.

#### EPA:

2

**NEMA Type:** 6H x 5V Beam Spread.

# **Replacement Range:**

The FXLED78 can be used to replace 150 - 320W Metal Halide Floodlights based on delivered lumens.

#### LEDs:

Six multi-chip, 13Watt high-output, long-life LEDs.

#### Driver:

Constant Current, Class 2, 2000mA, 100-277V, 50-60Hz, 1.1A, Power Factor 99%

**THD:** 5% at 120V, 13.1% at 277V

Surge Protection: 4kV

Ambient Temperature: Suitable for use in 40°C ambient temperatures.

# **Cold Weather Starting:**

Created: 02/23/2015

#### Thermal Management:

Superior heat sinking with external Air-Flow fins.

#### Housing:

Die-cast aluminum housing and door frame.

#### Mounting:

Heavy-duty Trunnion mount with stainless steel hardware.

#### **Color Consistency:**

7-step MacAdam Ellipse binning to achieve consistent fixture-to-fixture color.

#### **Color Stability:**

LED color temperature is warrantied to shift no more than 200K in CCT over a 5 year period.

#### **Color Uniformity:**

RAB's range of CCT (Correlated Color Temperature) follows the guidelines of the American National Standard for (SSL) Products, ANSI C78.377-2008.

#### Equivalency:

The FXLED78 is Equivalent in delivered lumens to a 250W Metal Halide.

**Reflector:** Specular vacuum-metallized polycarbonate

#### Gaskets:

High-temperature silicone gaskets.

#### Finish:

Our environmentally friendly polyester powder coatings are formulated for high-durability and long-lasting color, and contains no VOC or toxic heavy metals.

#### Green Technology:

Mercury and UV free.



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Page 1 of 2

FXLED78T - continued

#### IESNA LM-79 & LM-80 Testing:

RAB LED luminaires have been tested by an independent laboratory in accordance with IESNA LM-79 and LM-80, and have received the Department of Energy Lighting Facts label.

#### California Title 24:

See FXLED78SF/D10, FXLED78SF/BL, FXLED78SF/PCS or FXLED78SF/PCS2 (277V) for a 2013 California Title 24 compliant product. Any additional component requirements will be listed in the Title 24 section under technical specifications on the product page.

#### Warranty:

RAB warrants that our LED products will be free from defects in materials and workmanship for a period of five (5) years from the date of delivery to the end user, including coverage of light output, color stability, driver performance and fixture finish.

#### Patents:

The FXLED78 design is protected by U.S. Pat. D659,280, Canada Pat. 143155, China Pat. ZL201130443125.9, Mexico Pat. 36558 and pending patent in Taiwan.

#### **DLC Listed:**

This product is on the Design Lights Consortium (DLC) Qualified Products List and is eligible for rebates from DLC Member Utilities. Created: 02/23/2015



Email: sales@rabweb.com On the web at: www.rabweb.com Note: Specifications are subject to change without notice

Page 2 of 2

		- D	Туре:	Project:			Date:	Prepared
A Server	LINE		Catalog #:					by:
.Rx4T8 I' Tube & Drive	r Kit LT+D TUBE-DRIVER	• Re	NICAL trofits 4ft fluorescent lur places existing fluoresc ses existing lamp holders redesign or revised lay	entlamps and ballasts	<ul> <li>Equipped</li> </ul>	e as 12 d with tem ef	0-277VAC or 347VAC 0-10V dimmable LEE ficacies exceed 120 L	driver to 1%
UDEFUNCE		<ul> <li>OPTICAL         <ul> <li>240° Beam distribution for even illumination</li> <li>Three CCT options with CRI of 82</li> </ul> </li> <li>KIT INCLUDES         <ul> <li>LED T8 Modules</li> </ul> </li> </ul>			<ul> <li>UL Classified UL 1598C (US &amp; Canada)</li> <li>FCC Title 47 CFR, Part 15, Class A</li> <li>RoHS Compliant, contains no lead or mercury</li> <li>DesignLights Consortium qualified on select models. Consult www.designlights.org/QPL for details</li> </ul>			
			D EVERLINE Driver – iring, connectors, insta				ited warranty	
		EXAMF	<b>LE:</b> LR34T8-66L84	D-10DU				
ORDERING GI						-		
	Lamp & Length		Nominal Lumens	CRI (nom.)	Color Temp.	-	Dimming	Voltage
Geries			Nominal Lumens 44L = 4,400	<b>CRI (nom.)</b> <b>8</b> = 82 (nom.)	Color Temp. 35 = 3500K	-	Dimming 10D = 0-10V Dimming	Voltage U = 120-277VAC
Series	Lamp & Length	-				-	0	

#### **ORDERING NOTES**

1. Orders are shipped in bundled quantities of 10 drivers and the corresponding number of tubes

### DesignLights Consortium™ QPL Listed Products

	Model Number (2-Tube)	Model Number (3-Tube)	Model Number (4-Tube)
	LR24T8-44L835-10DU	LR34T8-66L835-10DU	LR44T8-88L835-10DU
120-277V	LR24T8-44L840-10DU	LR34T8-66L840-10DU	LR44T8-88L840-10DU
	LR24T8-44L850-10DU	LR34T8-66L850-10DU	LR44T8-88L850-10DU
	LR24T8-44L835-10D3	LR34T8-66L835-10D3	LR44T8-88L835-10D3
347V	LR24T8-44L840-10D3	LR34T8-66L840-10D3	LR44T8-88L840-10D3
	LR24T8-44L850-10D3	LR34T8-66L850-10D3	LR44T8-88L850-10D3

1/SIED

PERFORM	PERFORMANCE DATA									Performance data provided at 3500K.
	Lumen Input Power Input Current LRK System Reference Luminaire						<ul> <li>Reference Luminaire testing conducted by NVLAP accredited lab in accordance with</li> </ul>			
	Package	(watts)	@ 120V	@ 277V	@ 347V	Delivered Lm (nom.)	LPW	Delivered Lm (nom.)	LPW	IESNA LM-79.
LR24T8	44L	36	0.30	0.13	0.10	4400	122	3328	95	Consult factory for photometry.
LR34T8	66L	52	0.44	0.19	0.15	6600	127	5015	96	Application and performance
LR44T8	88L	70	0.59	0.26	0.20	8800	126	6616	95	information is subject to change without notification.

OPERATING DATA	
L70 Lumen Maintenance	>60,000 hrs at 40°C
Min. Starting Temp:	0°F
Sound Rating:	Class A
Power Factor:	>.98
THD:	<20%

LED Driver		
Lm Package	LED Driver -UNV	LED Driver -347
LR24T8-44L	D10CC55UNVTZCP67C	D10CC55347TZCP67C
LR34T8-66L	D10CC55UNVTZ-C10C	D10CC55347TZ-C10C
LR44T8-88L	D21CC80UNVTWDP67C	D21CC80347TWDP66C

\*Projected per IESNATM-21. Data extrapolated based on 10,000 hours of LED testing per IESNALM-80.

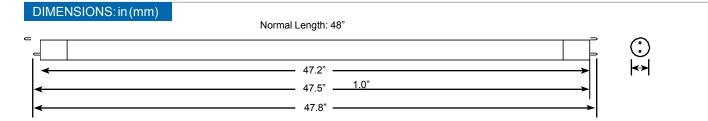
#### Applications

- All LED Tubes must be connected for proper operation.
  Not for use with phase cut dimmers.
  Suitable for 2'x4' with minimum 3" depth, may include a lens, and may be listed for elevated ambients of up to 40°C max in Type Non-IC or up to 25°C max in Type IC.
  Suitable for 4' or 8' strip light, wraparound, and vapor tight (see installation instructions for dimensions and max ambient).

LED Tube	
сст	LED T8 Tube
3500K	LRT8M22L/835A
4000K	LRT8M22L/840A
5000K	LRT8M22L/850A

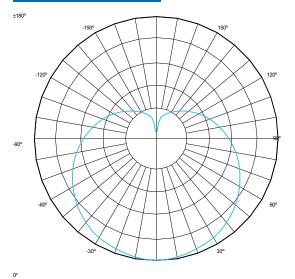
www.unvlt.com Rev. 7/12/16



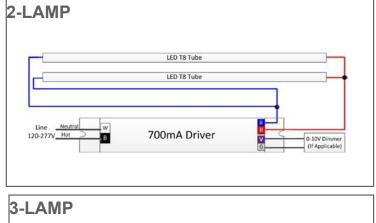


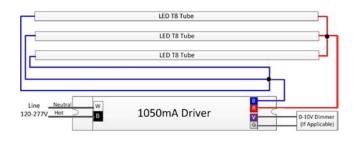
LED Driver Case Dimensions					
Case	Length	Width	Height	Mounting Length	Lead Exit
С	14.25"	1.18"	1.00"	13.75"	Side
D	16.88"	1.25"	1.00"	16.28"	Side

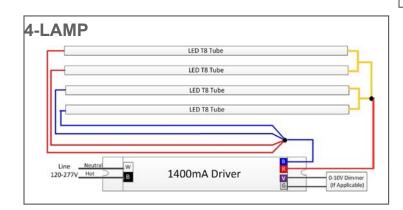
#### POLAR DISTRIBUTION



# CONNECTION DIAGRAMS







Wiring Diagrams show existing wire colors from an instant start T8 system

www.unvlt.com Rev. 7/12/16

Universal<sup>®</sup> Lighting Technologie

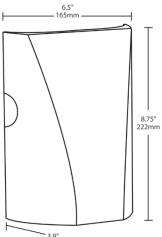
# SLIM26N

12, 18 and 26 Watt SLIM wallpacks are ultra efficient and deliver impressive light distribution with a compact low-profile design that's super easy to install as a downlight or uplight.

Color: Bronze

Weight: 4.5 lbs

LED Info		Driver Info	
Watts: Color Temp: Color Accuracy: L70 Lifespan: LM79 Lumens:	26W 4000K (Neutral) 86 100000 2,111	Type: 120V: 208V: 240V: 277V:	Constant Current 0.27A 0.17A 0.15A 0.13A
Efficacy:	66 LPW	Input Watts: Efficiency:	32W 81%



# **Ambient Temperature:**

Suitable for use in 40°C (104°F) ambient temperatures.

### **Technical Specifications**

#### UL Listing:

Suitable for wet locations. Suitable for mounting within 1.2m (4ft) of the ground.

#### **IP Rating:**

Ingress Protection rating of IP66 for dust and water.

#### LED:

Multi-chip, long-life LED.

#### Lifespan:

100,000-hour LED lifespan based on IES LM-80 results and TM-21 calculations.

#### Driver:

Constant Current, Class 2, 100-277V, 50/60 Hz., 6KV surge protection, 720mA, 100-277VAC 0.4 Amps, Power Factor 99%.

# THD:

12% at 120V

Input Watts: 32W.

**Output Lumens:** 2,111.

**Color Accuracy (CRI):** 86 CRI

**Correlated Color Temp. (Nominal CCT):** 4000K

**Cold Weather Starting:** The minimum starting temperature is -40°F/-40°C.

Created: 12/10/2013

#### Thermal Management:

Superior heat sinking with internal Air-Flow fins.

#### Housing:

Precision die-cast aluminum housing.

#### Mounting:

Heavy-duty mounting bracket with hinged housing for easy installation.

# Recommended Mounting Height:

Up to 22 ft.

#### **HID Replacement Range:**

The SLIM26 can be used to replace 175W MH based on delivered lumens.

Lens:

Tempered glass lens.

# Reflector:

Specular thermoplastic.

#### Gaskets:

High-temperature silicone.

#### Finish:

Our environmentally friendly polyester powder coatings are formulated for high-durability and longlasting color, and contains no VOC or toxic heavy metals.

#### **DLC Listed:**

This product is on the Design Lights Consortium (DLC) Qualified Products List and is eligible for rebates from DLC Member Utilities.

#### Dark Sky Approved:

The International Dark Sky Association has approved this product as a full cutoff, fully shielded luminaire.



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Page 1 of 2

SLIM26N - continued

#### Color Consistency:

3-step MacAdam Ellipse binning to achieve consistent fixture-to-fixture color.

#### **Color Stability:**

LED color temperature is warrantied to shift no more than 200K in CCT over a 5 year period.

#### **Color Uniformity:**

RAB's range of CCT (Correlated Color Temperature) follows the guidelines for the American National Standard for Specifications for the Chromaticity of Solid State Lighting (SSL) Products, ANSI C78.377-2011.

#### Green Technology:

Mercury and UV free, and RoHS compliant.

#### IESNA LM-79 & LM-80 Testing:

RAB LED luminaires have been tested by an independent laboratory in accordance with IESNA LM-79 and LM-80, and have received the Department of Energy "Lighting Facts" label.

#### Patents:

The design of the SLIM™ is protected by patents in

U.S. Pat D681,864, and pending patents in Canada, China, Taiwan and Mexico.

#### **Country of Origin:**

Designed by RAB in New Jersey and assembled in the USA by RAB's IBEW Local 3 workers.

#### **Buy American Act Compliant:**

This product is a COTS item manufactured in the United States, and is compliant with the Buy American Act.

#### **Recovery Act (ARRA) Compliant:**

This product complies with the 52.225-21 "Required Use of American Iron, Steel, and Manufactured Goods-- Buy American Act-- Construction Materials (October 2010).

#### **Trade Agreements Act Compliant:**

This product is a COTS item manufactured in the United States, and is compliant with the Trade Agreements Act.

#### **GSA Schedule:**

Suitable in accordance with FAR Subpart 25.4.

Created: 12/10/2013



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Page 2 of 2



# **FEATURES & SPECIFICATIONS**

 $\label{eq:intermediate} \textbf{INTENDED USE} - For wall or ceiling mounting, vertical or horizontal. The WL combines digital LED lighting$ 

and controls technologies with high-performance optical design to offer the most advanced wall-mount luminaire for general ambient lighting applications. High-efficacy light engine delivers long life and excellent color, ensuring a superior quality lighting installation that is highly efficient and sustainable.

CONSTRUCTION - H ousing is roll formed from code-gauge steel.

Impact modified linear-faceted refractor with light diffusing film. Refractor is retained in die cast ends providing secure installation and easy maintenance.

Decorative die-cast end caps provide added durability.

Finish: All metal parts are post-painted in white polyester powder coat for smooth, finished edges and uniform light distribution.

**OPTICS** — High impact acrylic diffuser with light diffusing film. Optically engineered for superior light distribution and maximum efficacy.

Crescent-shape linear faceted refractor system obscures and integrates individual LED images and uniformly

#### washes fixture surface with light.

**ELECTRICAL** — Long-life LEDs, coupled with high-efficiency drivers, provide superior quantity and quality of illumination for extended service life. WL is rated to deliver L80 performance for 50,000 hours.

Optional nLight<sup>m</sup> embedded controls continuously monitor system performance and allow for constant lumen management / compensation function.

Lumen Management: Unique lumen management system (option N80) provides onboard intelligence that actively manages the LED light source so that constant lumen output is maintained over the system life, preventing energy waste created by the traditional practice of over-lighting.

LED AccuDrive <sup>™</sup> driver delivers full-range dimming from 0-10V control signal.

Integral occupancy control: Sensor Switch nES 7 or nES PDT 7 integrated occupancy sensor allows luminaire to power off or dim to 10% to 50% output when space is unoccupied. Fixture designed to fail on.

The nES 7 is ideal for small rooms without obstructions or areas with primarily walking motion (e.g. corridors,

stairwells). Additionally, an optional integrated photocell enables daylight harvesting control as well.

For rooms like restrooms and private offices or any space with obstructions, the nES PDT7 dual technology sensor is recommended.

Driver disconnect provided where required to comply with US and

Canadian codes. Maintenance: LED boards include plug-in connectors

for easy replacement or servicing. LISTINGS – CSA certified to meet U.S.

and Canadian standards. Suitable for damp location.



DesignLights Consortium  $^{\oplus}$  (DLC) qualified product. Not all versions of this product may be DLC qualified.

Please check the DLC Qualified Products List at www.designlights.org/QPL to confirm which versions are qualified.

Patents pending.

WARRANTY — 5-year limited warranty. Complete warranty terms located at www.acuitybrands.com/CustomerResources/Terms\_and\_conditions.aspx

Note: Specifications subject to change without notice.

#### ORDERINGINFORMATIO. Lead times will vary depending on options selected. Consult with

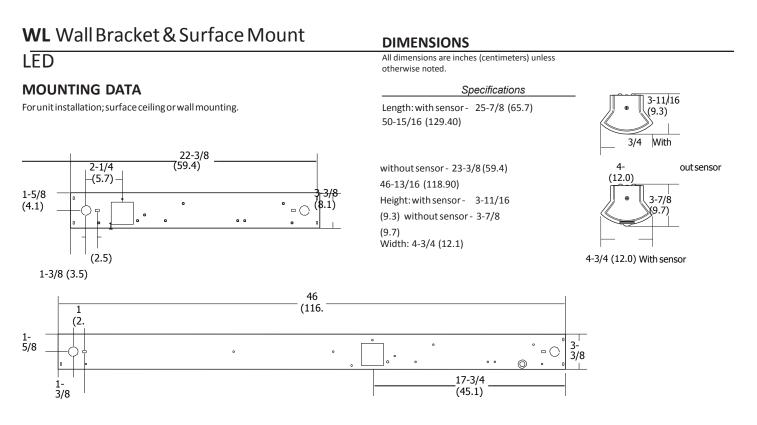
#### Example: WL4 25L D24

Series	5	Lumens₁	Voltage		Wattage	Color temperature	Lumen m	anagement	
WL2 WL4	2' wall-mount LED 4' wall-mount LED	-	r í	V) 347V <sub>6</sub>	D20 20W7 D24 24W7 D43 43W7	LP830 82 CRI, 3000 kelvin <sub>8,9</sub> LP835 82 CRI, 3500 kelvin LP840 82 CRI, 4000 kelvin LP850 82 CRI, 5000 kelvin <sub>8,9</sub>	n lumen ma	erator supply EM power nLight with 100% (L100) lun	0% (L80)
							piceoreficien	âentigbrtwsiehve00% (knie) kum	sepply EM
Occup	pancy control <sub>10</sub>			Standby mode	12	c	Options		Finish <sub>14</sub>

occupancy sensor <sub>11</sub> NESPDT7 Sensor Switch nES	unoccupied DIM10 Fixture dims to 10% when unoccupied DIM50 Fixture	EL14L LED Emergency battery pack (nominal 1400 lumens); see Life Safety section <sub>13</sub> SC Surface conduit end cap provisions
	Notes 1 Approximate lumen output. 2 For use with WL2 only, requind 3 For use with WL2 only, requind 4 For use with WL4 only, requind 5 For use with WL4 only, requind 6 Not available for use with WL2. 7 Actual wattage may differ by	ver. 11 Requires N80 or N100. ires 12 Requires occupancy control. ires 13 Not available with WL2; not available with 347V. ires 14 For additional paint finishes refer to ver. Architectural Colors. ires ver. +/- 5% when

LED LED

WL-



# PHOTOMETRICS

WL4 25L D24 LP835, 2505 delivered lumens, test no. LTL21295, tested in accordance to IESNA LM-79

180°					f		c	Coef	ficie	nts		tilizat	ion						
		CF	<b>9 Sum</b>	-	pf pc 	pw_	70%50	80% <u>)%3(</u>		50%		% )% <u>610%</u>	50%		)% 510%	<b>Z</b> one		men Sumn ns_% Lam	nary np_% Fixture
100		0°	684 5°67	684 5 683	1	0 103	115 11 98    98	5 11 93	-			) 110 85			102 79	0° - 30° 0° - 40°	525 852	20.9 34.0	20.9 34.0
200	HTX 6					2	93	84	77	81	74	69	75	69	64	0° - 60°	1483	59.2	59.2
300	HTXX	25 35				3 4,	85 77	74 65	65 56	71 63	63 54	57 48	65 58	59 51	54 45	0° - 90° 90° - 120°	2072 227	82.7 9.1	82.7 9.1
400	H	45	° 369	479		1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	71	58	49	56	47	41	52	45	39	90° - 130°	297	11.9	11.9
500		55 65				6 <b>)</b> 7	66 61	52 47	43 38	50 46	42 37	36 32	47 43	40 35	34 30	90° - 150° 90° - 180°	392 432	15.6 17.3	15.6 17.3
600	4	0 75 85		331 198	6		57 53	43 39	35 31	42 38	34 31	28 25	39 36	32 29	27 24	0° - 180°	2505	100.0	100.0
0°	20°	90		147	-	0	49	36	29	35	28	23	33	27	22				

# **Town of Natick Contract for Services Related to the** LED Retrofit of Morse Institute Library

90° 0°

0,		1	1		Total Lur	ilens w		tioiop	lions					
etom lamptupo Ballact factor Input watte				1	Watts saved by using LED		Control option							
LED-N100	LED	1	24		Lumen package	N	100	N	30	Dir	n50	Di	m10	
LED-N801	LED	1	19			Wattag	Lumens	Wattage	Lumens	Wattage	Lumens	Wattage	Lumens	
One-lamp T8	F32T8	0.88	28		3 <sup>12L</sup>	e 13	1200	10	1044	6.5	470	1.3	38	
One-lamp T5	F28T5	1	32		7 <sup>18L</sup>	20	1800	16	1566	10	810	2.0	126	
<b>-</b>					25L	24	2500	19	2175	12	1125	2.4	175	
te					41L	43	4100	34	3567	22	1845	4.3	330	

1 With nlight 80% lumen management input watts start at 19 and gradually increasing to 24 at 50,000 hrs.



WL-LED

LED: One Lithonia Way Conyers, GA 30012Phone: 800.858.7763 Fax: 770-929-8789 © 2012-2014 www.lithonia.com

This Agreement is made this \_\_\_\_\_ day of \_\_\_\_\_, 2018, by and between the Town of Natick with an address of Natick Town Hall, 13 East Central Street, Natick, MA 01760, by the Natick Board of Selectmen (hereinafter the "Town," or the "Client"), and Horizon Solutions, LLC, a limited liability corporation with a principal place of business at 175 Josons Drive, Rochester, New York 14623 (hereinafter the "Contractor" or "Horizon").

The words "he," "him" and "his" in this Agreement, as far as they refer to the Contractor, shall so refer whether the Contractor is an individual, partnership or corporation. All prior contracts, if any exist between the Town and the Contractor, are hereby terminated and shall be of no force and effect.

1. Scope of Services and Scheduling

In consideration of the obligations herein contained, Horizon shall perform the work included in the scope of work in the Horizon proposal dated January 23, 2017 (the "Project"), which is attached hereto and incorporated herein by reference. All materials shall be new and shall meet UL, Federal, State and Local code requirements. Any material change to the scope of work, including acceptance of the additional cost for the work, shall be agreed upon by both parties in writing before the work is performed. The work will be considered complete, with the exception of any minor open items, after the Client and Utility representative review and approval of the work (herein referred to as the "certificate of completion").

Horizon provides this proposal based on Prevailing wage requirements, if applicable, and all work performed during normal work week (7:00 A.M. to 3:30 P.M. local time), unless otherwise stated in the proposal.

Horizon shall install the Project with regard for the appearance and condition of the Client's property. Waste material shall be removed daily.

The Client will cooperate and coordinate with Horizon on scheduling and maximize productivity on Energy Conservation projects. The Client will allow Horizon access to areas of the building to ensure rapid, efficient installation and completion of the Project.

2. Standard of Care

The Contractor's services shall be performed as expeditiously as is consistent with professional skill and care and the orderly progress of the work. The Contractor shall exercise due care and diligence in the rendition of all services under this Agreement in accordance with the applicable professional standards in the eastern Massachusetts area. The Contractor's services shall be performed as expeditiously as is consistent with such standards.

3. Term

The term of this Agreement shall be for one (1) year, commencing as of the execution date of this Agreement, and ending one (1) year later.

4. Order of Priority of Agreement Documents

In the event of any conflict among the Agreement Documents, the Documents shall be construed according to the following priorities:

Highest Priority: Amendments to Agreement (if any)

#### Second Priority: Agreement

#### 5. Payment

In consideration for performance of the work in accordance with the requirements of this Agreement, the Client shall pay Horizon the prices set forth in Exhibit A, which is attached hereto and incorporated by reference.

This Agreement is a fixed price/fixed rate contract; and, therefore, miscellaneous expenditures associated with Horizon's work on the Project shall not be paid by the Client. In the event that an unforeseen miscellaneous expense is incurred, Horizon shall receive the Client's approval in writing prior to incurring the expense if it will subsequently seek payment of said expense from the Client.

Payment shall be made to Horizon for work completed in accordance with this Agreement. All requests for payment shall be submitted to the Client as an invoice and shall specify work completed, progress made toward completing deliverables, the number of hours worked, the classification of each employee who performed work, and the billing rate for each employee who performed work on the Project.

Payment will be due thirty (30) days after receipt of Horizon's invoice by the Client for services rendered in accordance with this Agreement. The Client shall not make payments in advance.

If the Client objects to all or part of any invoice, the Client shall notify the Horizon in writing within two (2) weeks of the date of receipt of the invoice, and shall pay that portion of the invoice not in dispute within thirty (30) days after the date of receipt of the invoice.

Should it be necessary for Horizon to engage the services of a specialized contractor or companies other than those originally proposed in Horizon's proposal, Horizon shall take such measures only with the Client's prior written approval. Charges for such services shall be billed directly to the Client unless otherwise agreed upon by the parties.

Payment of the amounts due under this Agreement shall release the Town of Natick and its officers, employees, boards, commissions, committees, agents and representatives, from any and all claims and liability in any way relating to this Agreement or anything done in pursuance thereof.

No payment by the Client to Horizon shall be deemed to be a waiver of any right of the Client under this Agreement or a ratification by the Client of any breach hereof by Horizon.

#### 6. Warranty

It is understood and agreed that Horizon will perform all services hereunder in a professional manner with appropriately skilled employees or subcontractors. Horizon warrantees the workmanship for one (1) year from the date of the certificate of completion and shall assign all applicable Manufacturers' warranties for products used on the Project to the Client. Horizon shall also assist in completing all applicable warrantee registration forms and explain the warrantee process for these Manufacturer warranties.

#### 7. Compliance with Laws

Horizon shall comply with all provisions of Federal, Massachusetts and Town of Natick law applicable to his work including, without limitation, statutes, by-laws, rules, regulations, orders and

directives, as amended, and including, without limitation, the Williams-Steiger Occupational Safety and Health Act, as amended, and related regulations, as amended, in effect throughout the term of this Agreement and any extension or renewal thereof. Without limitation, Horizon shall comply with the provisions of Chapter 149, Section 26 to 27D of the Massachusetts General Laws, as amended, and the applicable minimum wage rates as determined by the Massachusetts Commissioner of Labor and Industries. This Agreement shall be considered to include in their entirety all terms respecting workers' compensation insurance and other terms required to be included in it by Chapter 152 of the Massachusetts General Laws, as amended, as though such terms were set forth in their entirety herein.

8. Insurance

Horizon shall insure and shall require each of its subcontractors to carry the following insurance to the extent stated:

- a. Workers' Compensation Insurance as required by the laws of the Commonwealth of Massachusetts and employer's liability insurance in the amount of \$1,000,000/\$1,000,000.
- b. Commercial General Liability Insurance, \$1,000,000 each occurrence and \$2,000,000 aggregate limit. Commercial General Liability insurance shall include personal injury liability, broad form property damage liability, products/completed operations liability and broad form contractual liability.
- c. Automobile Liability Insurance, covering all non-owned and hired vehicles Combined single limit of \$1,000,000.
- d. Professional Liability Insurance, covering errors and omissions, \$1,000,000 each occurrence and \$2,000,000 aggregate limit.
- e. Excess Liability Insurance, Umbrella Form \$1,000,000 each occurrence and \$2,000,000 aggregate, which shall be following form, providing coverage over commercial general liability insurance and employer's liability under workers' compensation insurance.
- f. The Town of Natick shall be named as additional insured on each such policy of Commercial General Liability Insurance and, if required, Automobile Liability Insurance.
- g. All certificates and policies shall contain the following provision:

"Notwithstanding any other provision herein, should any of the above policies be cancelled or materially amended before the expiration date thereof, the issuing company will mail thirty (30) days prior written notice thereof to the named certificate holder and to the Natick Town Administrator, Natick Town Hall, 13 East Central Street, Natick, MA 01760, before such cancellation or amendment shall take place."

h. Certificates evidencing such insurance in five (5) copies shall be furnished to the Client at the execution of this Agreement. Such certificates shall not merely name the types of policy provided, but shall specifically refer to this Agreement and shall state that such insurance is as required by this Agreement. Horizon shall make no claims against the Town of Natick or its officers for any injury to any of its officers or employees or for damage to its equipment

arising out of work contemplated by the Agreement.

- i. Horizon shall also be required to provide to the Town of Natick with its proof of insurance coverage endorsements or riders to the policies of commercial general liability insurance and, if required, automobile liability insurance, which indicate that the Town of Natick are named as additional insureds on each such policy.
- j. No insurance shall be obtained from an insurer which:

1. is not licensed to sell insurance in the Commonwealth of Massachusetts; or

2. is not authorized to provide insurance as an excess or surplus lines insurer, and does not have a current Best's rating of A or better.

k. Failure to provide and continue in force such insurance as aforesaid shall be deemed a material breach of this Agreement and shall operate as an immediate termination thereof.

### 9. Indemnification

Horizon shall compensate the Client for all damage to the Client's property of any nature arising out of Horizon's work. To the fullest extent permitted by law, Horizon shall indemnify, defend, and hold harmless the Town of Natick and all of its officers, employees, boards, commissions, committees, agents and representatives from and against all claims, causes of action, suits, costs, damages, and liability of any kind which arise out of the breach by Horizon of its obligations under this Agreement, or the act or omission of Horizon, its subcontractors, or their officers, employees, agents and representatives or anyone directly or indirectly employed by them, or anyone for whose acts or omissions they may be liable, regarding the work to be performed by Horizon under the Agreement, or which arise out of the violation of any federal, Massachusetts or Town of Natick statute, by-law, rule, regulation, order or directive, or which relate to personal injury or property damage suffered by Horizon or any of its officers or employees regarding the subject matter of this Agreement. Said costs shall include, without limitation, legal costs, collections fees, and counsel fees incurred in defending any claim or suit that may be brought against the Client and any judgment that may be obtained in any such claim or suit.

#### 10. No Personal Liability

Neither the Town of Natick, nor its officers, employees, boards, committees, commissions, agents and representatives shall be under any personal obligation or incur any personal liability by reason of this Agreement, the execution thereof or anything relating thereto which arises out of the breach or violation of any provision of this Agreement, or the violation of any Federal, Massachusetts or Town of Natick statute, by-law, rule, regulation, order or directive, or which relates to personal injury or property damage suffered by Horizon or its employees, regarding the subject matter of this Agreement.

#### 11. Familiarity with Area of Work

By signing this Agreement, Horizon acknowledges that it has examined the subject matter of this Agreement, including, without limitation, the provision of energy consulting services, and that it is familiar with all sites which are the subject of this Agreement in the Town of Natick and with all conditions of this Agreement. Horizon has entered into this Agreement in reliance on its own

examinations and estimates as to the amount and character of its work, and conditions which may be encountered in the performance thereof, and shall assume all risks and bear all losses pertaining thereto.

The nature of Horizon's work includes the installation of energy efficiency equipment and solutions. Horizon does not take responsibility for the following existing conditions at the Project site: existing code violations, structural issues, deteriorating wiring and hazardous material, such as asbestos, lead paint, and oil. To the extent that Horizon and/or its officers, employees, agents, subcontractors or consultants do not cause the presence of hazardous material at the Project site, Horizon and its officers, employees, agents, subcontractors and consultants shall have no responsibility for the discovery, presence, handling, removal or disposal of, or exposure of persons to, hazardous material in any form at the Project site. If Horizon discovers hazardous material at the Project site, it shall immediately notify the Client in writing and shall refrain from disturbing or taking any action with respect to the hazardous material in the absence of the Client's written direction. In the event Horizon does disturb such hazardous material or does take such action without written direction, the limitation of liability in this paragraph shall not apply.

12. Performance Bond

DELETED – NOT APPLICABLE.

13. Labor and Materials Payment Bond\_

DELETED – NOT APPLICABLE.

14. Independent Contractor Status

Horizon shall provide services under this Agreement as an independent contractor with the Town of Natick and not as an employee of the Town. No employee, agent or representative of Horizon shall be entitled to receive any benefits of employment with the Town of Natick, including without limitation salary, overtime, vacation pay, holiday pay, sick leave, health insurance, life insurance, pension or deferred compensation.

15. Use of Alcohol and Controlled Substances Prohibited

Horizon hereby acknowledges that the use of alcoholic beverages, narcotics, and mood altering substances, except for current valid, legal prescriptions, by any officer, employee, agent, or representative of Horizon is prohibited on Town property which is the subject matter of this Agreement and during all hours of work under this Agreement. If any officer, employee, agent, or representative of Horizon violates the foregoing provision, the Client shall have the right to order that such officer, employee, agent, or representative of Horizon shall not be permitted to return to work on this Agreement. Under such circumstances, Horizon shall promptly remove the subject officer, employee, agent, or representative from the job site and shall not permit the subject officer, employee, agent, or representative to perform further work in conjunction with this Agreement.

16. No Smoking

Pursuant to Massachusetts General Laws (M.G.L.) c. 270, §22, the Commonwealth of Massachusetts Smokefree Workplace Law, Horizon, its officers, employees, agents, and representatives shall refrain from smoking and from using tobacco products in any public building in the Town of Natick.

#### 17. Criminal Background Screening

For each employee of Horizon who is performing services under this Agreement, Horizon shall, subject to its confidentiality and privacy obligations owing to its employees and third parties, provide a written confirmation to the Client that such employee passed Horizon's pre-employment criminal background screen. In the event that any employee refuses to permit Horizon to provide such information to the Client, Horizon shall not assign such employee to perform services for the Client, and such employee shall not be authorized to perform services for the Client. The Client shall be permitted to keep such information in its files.

#### 18. Delays/Force Majeure

Except as specifically set forth in this Agreement, neither party shall hold the other responsible or liable for damages or delays in performance caused by acts of God, interruptions in the availability of labor, or other events beyond the control of the other party, or that could not have been reasonably foreseen or prevented. For this purpose, such acts or events shall include unusually severe weather affecting performance of services, floods, epidemics, wars, riots, strikes, lockouts, or other industrial disturbances, protest demonstrations, and project site conditions which could not have been reasonably anticipated. Should such acts or events occur, both parties shall use their best efforts to overcome the difficulties arising and to resume as soon as reasonably possible the normal pursuit of the services for the Project.

#### 19. Termination

- a. If Horizon shall breach any provision of this Agreement, which breach is not cured within twenty-one (21) days of written notice thereof from the Client to Horizon, the Client shall have the right to terminate this Agreement upon written notice to Horizon.
- b. If any assignment shall be made by Horizon or by any guarantor of Horizon for the benefit of creditors, or if a petition is filed by Horizon or by any guarantor of Horizon for adjudication as a bankrupt, or for reorganization or an arrangement under any provision of the Bankruptcy Act as then in force and effect, or if an involuntary petition under any of the provisions of the Bankruptcy Act is filed against Horizon and such involuntary petition is not discharged within ninety (90) days thereafter, in any event the Client may terminate this Agreement upon written notice to Horizon.
- c. The award of this Agreement and the continued operation of this Agreement are contingent upon appropriation by Natick Town Meeting of sufficient money to fund the Agreement. Should Natick Town Meeting fail to appropriate necessary funds therefore, the Client shall no longer be under any obligation to tender performance, including payment, under the terms of this Agreement. In that event, the Client may terminate this Agreement upon written notice to Horizon.
- d. The Client may terminate this Agreement upon written notice to Horizon if a source of money to fund the Agreement is lost during the Agreement term. In the alternative, the parties may agree in writing to amend the Agreement to provide for an Agreement price which represents a reduced appropriation for the Agreement term.
- e. The Client may also terminate this Agreement for convenience upon thirty (30) days' written notice to Horizon.

In the event of termination Horizon shall be entitled to be paid for services rendered in

accordance with this Agreement prior to termination.

In the event that this Agreement is terminated pursuant to Section a. or b. above, the Client may make any reasonable purchase or contract to purchase services in substitution for services due from Horizon and may deduct the cost of any substitute contract, or damages sustained by the Client due to non-performance or non-conformance of services together with incidental and consequential damages from the Agreement price, and shall withhold such damages from sums due or sums which become due.

#### 20. Notices

Except as otherwise provided in this Agreement all notices required or permitted to be given hereunder shall be in writing and shall be delivered by certified mail or registered mail, return receipt requested, to the parties at the following address or such other address or addresses as to which a party shall have notified the other party in accordance with this Section.

If to the Town of Natick:	Melissa A. Malone Town of Natick 13 East Central Street Natick, MA 01760
With copies to:	Karis North, Esq. Murphy, Hesse, Toomey & Lehane, LLP 300 Crown Colony Drive, Suite 410 Quincy, MA 02169
If to Horizon:	President Horizon Solutions LLC 175 Josons Drive Rochester, NeNY14623.

#### 21. Miscellaneous Provisions

- a. Any action at law or suit in equity instituted by Horizon as a result of the performance, nonperformance or alleged breach of this Agreement shall be filed in the Superior Court of the Commonwealth of Massachusetts for Middlesex County, MA, and in no other court or jurisdiction.
- b. No action or failure to act by either party shall constitute a waiver of a right or duty afforded to that party under the Agreement, nor shall such action or failure to act constitute approval of or acquiescence in a breach thereunder, except as may be specifically agreed in writing. No forbearance or indulgence in any form or manner by either party shall be construed as a waiver or in any way limit the legal or equitable remedies available to that party. No waiver by either party of any default or breach by the other party shall constitute a waiver of any subsequent default or breach.
- c. If Horizon discovers or is informed of any discrepancy or inconsistency in the Agreement Documents in relation to any law, statute, ordinance, by-law, decree, code, rule, regulation, or order, Horizon shall promptly, before commencing services under this Agreement, report the same to the Client in writing.

- d. Horizon acknowledges that it has not been influenced to enter into this Agreement, nor has Horizon relied upon any warranties or representations not set forth in this instrument.
- e. Horizon shall maintain the confidentiality of information designated by the Client as confidential, unless withholding such information would violate the law or create a risk of significant harm to the public, or unless Horizon has been required to release such information by final judgment or order of a court of competent jurisdiction, or unless the Client has expressly waived such confidentiality in advance in writing.
- g. Horizon shall not represent or purport to represent that it speaks for the Client vis-à-vis the media or the public at-large without the Client's express, written consent in advance.
- h. Prior to commencing services under this Agreement, Horizon shall furnish the Client, in writing, the names, addresses and telephone numbers of not fewer than two (2) principal employees of his business who are to be contacted in the event of an after-hours emergency.
- i. By entering into this Agreement, Horizon certifies under penalties of perjury that its entry was made and submitted in good faith and without collusion or fraud with any person. As used in this certification, the word "person" shall mean any natural person, business, partnership, corporation, union, committee, club, or other organization, entity, or group of individuals.
- j. By entering into this Agreement, Horizon certifies under the penalties of perjury, pursuant to M.G.L. c.62C, Section 49A(b), that it has complied with all laws of the Commonwealth relating to taxes, to reporting of employees and contractors, and to withholding and remitting child support.
- k. Prevailing wage rates, as contained in the Bid documents, shall be paid, pursuant to M.G.L. c.149, §§26-27G, if they are applicable.
- 1. Horizon understands that the Massachusetts Conflict of Interest Law, Chapter 268A of the Massachusetts General Laws, applies to Horizon with respect to the services required to be provided under this Agreement. Horizon and its officers, employees, agents, subcontractors and affiliated agencies shall not participate in any activity which constitutes a violation of the Massachusetts Conflict of Interest Law or which creates an appearance of a violation of the Massachusetts Conflict of Interest Law.
- m. Horizon shall not discriminate against or exclude any person from participation herein on grounds of race, color, religious creed, national origin, sex, gender identity, sexual orientation (which shall not include persons whose sexual orientation involves minor children as the sex object), age, genetic information, ancestry, children, marital status, veteran status or membership in the armed services, the receiving of public assistance, and handicap. The previous sentence shall include, but not be limited to, the following: advertising, recruitment; hiring; rates of pay or other forms of compensation; terms; conditions or privileges of employment; employment upgrading; transfer; demotion; layoff; and termination. Horizon shall take affirmative actions to insure that applicants are employed, and that employees are treated during their employment, without regard to race, color, religious creed, national origin, sex, gender identity, sexual orientation (which shall not include persons whose sexual orientation involves minor children as the sex object), age, genetic information, ancestry, children, marital status, veteran status or membership in the

armed services, the receiving of public assistance, and handicap.

- n. To the extent that any of the foregoing sections required by Massachusetts law are inconsistent with other, non-statutory sections in this Agreement, any statutorily-mandated provisions contained herein shall control.
- o. Horizon shall not assign or subcontract in whole or in part this Agreement or in any way transfer any interest in this Agreement without the prior express written approval of the Client.
- p. This Agreement may be amended only by written consent of both parties.
- q. Horizon shall not assign any money due or to become due to Horizon unless the Client shall have received prior written notice of such assignment. No such assignment shall relieve Horizon of its obligations under this Agreement.
- r. If any provision, or portion thereof, of this Agreement shall be adjudged to be invalid or unenforceable by final judgment or order of a court of competent jurisdiction, the remaining provisions of the Agreement shall continue in effect to the extent permitted by law.
- s. The provisions of this Agreement shall be binding upon and inure to the benefit of the heirs, assigns and successors in interest of the parties.
- t. This Agreement shall be governed by and construed in accordance with the laws of the Commonwealth of Massachusetts, regardless of choice of law issues or principles.
- u. This Agreement is executed in triplicate as a sealed instrument.

(The remainder of this page is left intentionally blank.)

The Town of Natick, Massachusetts	Horizon Solutions, LLC
By: The Natick Board of Selectmen	By:
Amy K. Mistrot, Chair	Signature
Susan G. Salamoff, Vice Chair	Printed Name
Michael J. Hickey, Jr., Clerk	Printed Title
Jonathan Freedman	
Richard P. Jennett, Jr.	
Dated:	Dated:

# APPROVED AS TO AVAILABILITY OF APPROPRIATION:

In accordance with the requirements of M.G.L. Chapter 44, Section 31C, this is to certify that an appropriation in the amount of this Agreement is available therefor, and that the Natick Board of Selectmen is authorized to execute this Agreement and to approve all requisitions and execute change orders.

Arti P. Mehta Comptroller, Town of Natick Dated:

APPROVED AS TO FORM ONLY, AND NOT AS TO SUBSTANCE:

Karis North, Esq.		

# CERTIFICATE OF VOTE

I,(Clerk	/Secretary)		, hereby certify		
that I am the duly	qualified and acting	(Title)	o (Corporation Name	of e)	
	fy that at a meeting of the meeting all Directors we				ly
VOTED: To auth	norize and empower eithe	er		;	
(Name)	· ,				
(Name),	(Title)	_; or			
(Name),	(Title),	_			
any or	ne acting singly, to execu	ite all contracts and	bonds on behalf of th	e Corporation.	
	hat the above vote is still or modified in any respe		e day of	, 20 a	and has

Signature

Printed Name

Printed Title

The certification contained hereabove shall be executed by CONTRACTOR or copy of current "certification of authority to sign for the Corporation" shall be attached.)

#### **Exhibit A: Project Cost and Payment Terms**

Company Name:	Town of Natick
<b>Billing Address:</b>	13 East Central Street, Natick Town Hall, Natick, MA 01760

#### Purchase Order/Contract #:

Project Cost:	
Labor, Material, Disposal Costs	\$47,847.63
Sales Tax on Material	N/A
Total Project Cost	\$47,847.63
Less: *Estimated Project IncentivesUtilityApp #EversourceNR180403	\$13,849.00
Total Incentives Net Project Cost to Client	\$13,849.00 <b>\$33,998.63</b>

Note:

# **Project Payment Terms:**

Amount to be paid by the Client to Contractor ( <i>Payable 30 days after invoice date</i> ))	\$33,998.63
Amount to be paid by Utilities to Contractor (Contractor will collect this amount directly from the second	\$13,849.00 the Utilities)
Total Project Cost	\$47,847.6 <u>3</u>

The final invoice date will be determined by the "Certificate of Completion" as described in the Terms & Conditions.

Exhibit B: Project Proposal



# Energy Efficiency Proposal Town of Natick – Morse Library Lighting



Prepared by Tony Parente & Brandon Tibbitts Horizon Energy Services LLC 1/23/2017



# **FEATURES & SPECIFICATIONS**

**INTENDED USE** — The BLT Best-in-Value Low Profile LED luminaire features a popular center basket design that offers a clean, versatile style andvolumetric distribution. High efficacy LED light engines deliver energy savings and lowmaintenance compared to traditional sources. Anextensive selection of configurations and options make the BLT the perfect choice for many lighting applications including schools, offices and other commercial spaces, retail, hospitals and healthcare facilities. The low profile BLT design (2-3/8") also makes it an excellent choice for renovation projects.

**CONSTRUCTION** — BLT enclosure components are die-formed for dimensional consistency and painted after fabrication with a polyester powder paint for improved performance and protection.

The reflector is finished with a high reflective matte white powder paint for improved aesthetics and increased light diffusion.

End plates contain easy-to-position integral T-bar clips for securely attaching the luminaire to the T-grid. For additional T-grid security, optional screw on T-bar clips are available.

Diffusers are extruded from impact modified acrylic for increased durability. Injection molded diffuser light traps add a finished look to the diffuser ends and help seal the diffuser to the housing end plates. Optional diffuser trim rings provide an attractive mounting for integral sensors as well as adding a decorative element to the luminaire aesthetics.

LED boards are accessible from below; driver is accessible from the plenum.

**OPTICS** — Volumetric illumination is achieved by creating an optimal mix of light to walls, partitions and vertical and horizontal work surfaces – rendering the interior space, objects and occupants in a more balanced, complimentary luminous environment. High performance extruded acrylic diffusers conceal LEDs and efficiently deliver light in a volumetric distribution. Four diffuser choices available - curved and square designs with linear prisms or a smooth frosted finish.

**ELECTRICAL** — Long-life LEDs, coupled with high-efficiency drivers, provide superior quantity and quality of illumination for extended service life. 70% LED lumen maintenance at 60,000 hours (L70/60,000).

Non-Configurable BLT: 0-10 volt dimming driver. Dims to 10%

**Configurable BLT:** available in High Efficiency (HE) versions for applications where a lower wattage (over the standard product) is required. The High Efficiency versions deliver >130 LPW and can be specified via the Lumen Package designations in the Ordering Information below.

eldoLED driver options deliver choice of dimming range, and choices for control, while assuring flicker-free, low-current inrush, 89% efficiency and low EMI.

Optional integrated nLight®controls make each luminaire addressable allowing it to digitally communicate with other nLight enabled controls such as dimmers, switches, occupancy sensors and photocontrols. Connection to nLight is simple. It can be accomplished with integrated nLight AIR wireless or through standard Cat-5 cabling. nLight offers unique plug-andplay convenience as devices and luminaires automatically discover each other and self-commission, while nLight AIR is commissioned easily through an intuitive model app.

Lumen Management: Unique lumenmanagementsystem (option N80) provides on board intelligence that actively manages the LED light source so that constant lumen output is maintained over the system life, preventing the energy waste created by the traditional practice of over-lighting.

Step-level dimming option allows system to be switched to 50% power for compliance with common energy

Driver disconnect provided where required to comply with US and Canadian codes.

SENSOR-- Integrated sensor (individual control): Sensor Switch MSD7ADCX (Passive infrared (PIR)) or MSDPDT7ADCX (PDT)) ((PIR/Microphonics Dual integrated Tech occupancy sensor/automatic dimming photocell allows the luminaire to power off when the space is unoccupied or enough ambient light is entering the space. See page 4 for more details on the integrated sensor.

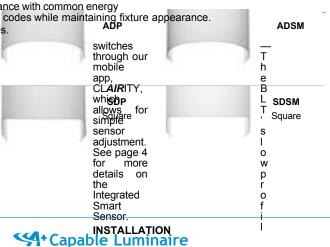
Integrated Sensor (nLight Wired Networking): This sensor is nLightenabled, meaning it has the ability to communicate over an nLight network. When wired, using CAT-5 cabling, with other nLight-enabled sensors, power packs, or WallPods, an nLight control zone is created. Once linked to a Gateway, directly or via a Bridge, the zone becomes capable of remote status monitoring and control via SensorView software. See page 4 for the nLight sensor options.

Integrated Smart Sensor (nLight Air Wireless Platform): The rES7 sensor is nLight AIR enabled, meaning it has the ability to communicate over the wireless nLight control platform. It is both a digital PIR occupancy sensor/automatic dimming photocell. It pairs to other luminaires and wall



All dimensions are inches (centimeters) unless otherwise specified.

# **Multiple Diffuser Options**



This item is an AL canable luminaire which has had

<pre>restrictive plenum applications. The BLT fits into standard 15/16" and narrow 9/16" T-grid ceiling systems. Suitable for damp location. For recessed mounting in hard ceiling applications, Drywall Grid Adapters (DGA) are available as an accessory. See Accessories section. LISTINGS — CSA Certified to meet U.S. and Canadian standards. IC rated. DesignLights Consortium® (DLC) Premium qualified product. Not all versions of this product may be DLC Premium qualified. Please check the DLC Qualified Products List at www.designlights.org/QPL to confirm which versions are qualified. WARRANTY — 5-year limited warranty. Complete warranty terms located at www.acuit ybrands.com/CustomerResources/Terms_and_condition s.aspx</pre>			
Suitable for damp location. For recessed mounting in hard ceiling applications, Drywall Grid Adapters (DGA) are available as an accessory. See Accessories section. LISTINGS — CSA Certified to meet U.S. and Canadian standards. IC rated. DesignLights Consortium® (DLC) Premium qualified product. Not all versions of this product may be DLC Premium qualified. Please check the DLC Qualified Products List at <u>www.designlights.org/QPL</u> to confirm which versions are qualified. WARRANTY — 5-year limited warranty. Complete warranty terms located at <u>www.acuit</u> ybrands.com/CustomerResources/Terms_and_condition s.aspx NOTE: Actual performance may differ as a result of end-user environment and application. All values are design or typical values, measured under laboratory conditions at 25 °C. Specifications subject to change without notice.	e design of only 2-3/8" provides increased installation flexibility especially in restrictive plenum applications. The BLT fits into standard 15/16" and narrow 9/16" T-grid ceiling systems.	Curved Ribbed	Curved Smooth
(DGA) are available as an accessory. See Accessories section. LISTINGS — CSA Certified to meet U.S. and Canadian standards. IC rated. DesignLights Consortium® (DLC) Premium qualified product. Not all versions of this product may be DLC Premium qualified. Please check the DLC Qualified Products List at <u>www.designlights.org/QPL</u> to confirm which versions are qualified. WARRANTY — 5-year limited warranty. Complete warranty terms located at <u>www.acuit</u> ybrands.com/CustomerResources/Terms_and_condition s.aspx NOTE: Actual performance may differ as a result of end-user environment and application. All values are design or typical values, measured under laboratory conditions at 25 °C.	Suitable for damp location.		
DesignLights Consortium® (DLC) Premium qualified product. Not all versions of this product may be DLC Premium qualified. Please check the DLC Qualified Products List at <u>www.designlights.org/QPL</u> to confirm which versions are qualified. <b>WARRANTY</b> — 5-year limited warranty. Complete warranty terms located at <u>www.acuit</u> <u>ybrands.com/CustomerResources/Terms_and_condition</u> <u>s.aspx</u> <b>NOTE:</b> Actual performance may differ as a result of end-user environment and application. All values are design or typical values, measured under laboratory conditions at 25 °C.			
versions of this product may be DLC Premium qualified. Please check the DLC Qualified Products List at <u>www.designlights.org/QPL</u> to confirm which versions are qualified. <b>WARRANTY</b> — 5-year limited warranty. Complete warranty terms located at <u>www.acuit</u> <u>ybrands.com/CustomerResources/Terms_and_condition</u> <u>s.aspx</u> <b>NOTE:</b> Actual performance may differ as a result of end-user environment and application. All values are design or typical values, measured under laboratory conditions at 25 °C.	LISTINGS — CSA Certified to meet U.S. and Canadian standards. IC rated.		
warranty terms locáted at www.acuit	versions of this product may be DLC Premium qualified. Please check the DLC Qualified Products List at <u>www.designlights.org/QPL</u> to confirm		
environment and application. All values are design or typical values, measured under laboratory conditions at 25 °C.	warranty terms located at www.acuit / ybrands.com/CustomerResources/Terms_and_condition		
	environment and application. All values are design or typical values, measured under laboratory conditions at 25 °C.		

# **2BLT** Volumetric Recessed Lighting 2'x2'

A compable options indicated by this color background.

\*

DRDERING	Lead	times will vary	depending on	options	selected. Consult			Exampl	e: 2BLT2 33L
2BLT2									
Series	Airfunction	Lumens₁		Diffuser		Voltage	Drive	r	Color temperature
2BLT2 2X2 BLT	(blank) Static AAir supply/ return	effi iency (>100 LPW) 20L 2000 33L 3300 40L 4000	effi iency2,3 (>130 LPW) 33LHE 3300 40LHE 4000 48LHE 4800	r -	Curved, linear DSM Curved, Square, linear Square, smooth Square, smooth	(blank) MV 120 120 277 277 347 347	V V SID	eldoLED dims to 1% (0-10 volt dimming) Step- level dimmin g₅ Lutron Ecosystem driver dims to 1% 5.6	LP830 82CRI, 3000 K LP835 82CRI, 3500 K LP840 82CRI, 4000 K LP850 82CRI, 5000 K LP930 90CRI, 809000, 5000000, 500
Controls		Occupancy	<sup>r</sup> control <sub>9</sub>		1		Options		
N80 nLig N80EMG nLi Umen nanagement Jenerator sup V100 nLig Umen manag V100EMG nL Umen nanagement Jenerator sup	ght® with 80% For use with ply EM power7 ght® without gement ight® without	NES7 PIR integral sensor <sub>10</sub> NESPDT7 dual technology i occupancy NES7ADCX PIR integral occu automatic di NESPDT7AI 7 dual technology i sensor with photocell <sub>10</sub>	nLight <sup>™</sup> nES integral control₁₀ nLight <sup>™</sup> nES ipancy sensor mming photoc DCX nLight <sup>™</sup> ntegral occupa automatic dim	7 PDT 7 7 ADCX with cell <sub>10</sub> nES PDT ncy ming	Individual Control MSD7ADCX PIR i occupancy sensor with autom dimming control p MSDPDT7ADCX occupancy sensor automatic dimming photocell <sub>5,11</sub> <b>nLight Wireless 2</b> RES7Z nLigh integral occupancy with automatic dim photocell for zone	ntegral atic hotocell <sub>5,11</sub> PDT integra with g control <b>Zone</b> nt AIR PIR y sensor iming	PWS1836 gauge, 1 c PWS1846 gauge, 2 c cables: or 18 gauge, diameter, PWS1856 gauge, 1 c	1400 luma Chicago p Bodine G 6 6' pre-wire ircuit 0 6' pre-wire circuit PWS1846 ne 6' pre-wire, 3 2 circuits; one 6' 18 gauge, purp 2 LV 6' pre-wire ircuit age purple and g Fast-blow	enerator Transfer e, 3/8" diameter, 18 e, 3/8" diameter, 18 6 PWSLV Two /8" diameter, pre-wire, 3/8" le and gray <sub>15</sub> e, 3/8" diameter, 18 rey wires <sub>15</sub>
		nLightWire RES7N	less Networki nLight	•			NPLT RRL	Narrow p	allet -ready luminaire <sub>17</sub>
		Blandstand	n neettmankiyge	nsor	1		DAGAS		Accessories next p

Non-Con	Non-Configurable BLT							
Stock/MT	Catalog	UPC	Lumen	Wattag	LPW	Color	Voltage	Pallet
9tock	<b>Descriptica</b> dp	008898044719	<b>9</b> 241	<b>e</b> 30	108	<b>TSOOPSBELUTRI</b>	120-277	Qty <sub>52</sub>
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	28672 33L ADP	<b>88</b> 898046200	3241	30	108	3500K/82CRI	120-277	52
	<b>₽₽</b> 1#2\$\$183€₽	<b>80</b> 8898046200	3313	30	111	4000K/82CRI	120-277	52
MTO	2BLT2 33L ADP 347	008898045693	3241	30	108	3500K/82 CRI	347	52
	2BLT2 33L ADP 347	008898045694	3313	30	111	4000K/82CRI	347	52
MTO	288 <b>ቶ2</b> 33L ADP ጀቴቢ <b>ቶ</b> 2 \$98 <b>A</b> 5 28LT2 33L ADP 347	88898046200 88898046200 008898045693	3241 3313 3241	30 30 30	108 111 108	3500K/82CRI 4000K/82CRI 3500K/82 CRI	120-277 120-277 347	52 52 52

Note

		6
es		0
2	1 Approximate lumen output. All versions may not achieve 130+ LPW.	N
_	Refer to photometry on	0
	www.acuitybrands.com.	l
	3 High efficiency performance not available in AIR	a
	versions, 90 CRI or versions with integral sensor/trim	v a
	rings.	i
4	······································	I
	packs.	а
5	5 Not available with N80, N80EMG, N100, N100EMG,	b
	NLTAIR, or occupancy control.	1

 e with controls, occupancy controls, or PWS options. Consult factory for Hi-Lume dimming.
 7 nLight EMG option requires a connection to existing nLight network. Power is provided from a separate N80 or N100 enabled fixture.
 8 Must order with RES7N or RES7Z sensor. Only available with EZ1 driver.

 Must specify diffuser with trim rings. See sensor options on page 4.
 Requires N80, N80EMG, N100, or N100EMG.

10 Requires N80, N80EMG, N100, or N100EMG 11 Only available with EZ1 driver option. 0-10v dimming wires not accessible via access plate.

12 When using pre-wire option, use PWS1846. or PWS1846 PWSLV.

13 Not available with N80, N80EMG, N100 or N100EMG.

 Must specify voltage. Requires BSE labeling, voltage specific. Consult factory for options.
 Not available with nLIGHT wired/wireless network or individual controls.
 Must specify voltage, 120 or 277 with GLR & GMF

fusing and BGTD.

17 For ordering logic consult: RRL\_2013.

2BLT-2X2





An **Cuity**Brands Company

LED: One Lithonia Way Conyers, GA 30012 Phone: 800-858-7763 www.lithonia.com ©2015-2016 Acuity Brands Lighting, Inc. All rights reserved. Fax: 770-929-8789

Rev. 10/06/16

# **2BLT** Volumetric Recessed Lighting 2'x2'

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Accessories: Order as separate catalog					
<i>number.</i> DGA22 fixture	Drywall grid adapter for 2x2 recessed				

Order as separa	ate catalog number.	Visit www.acuitybrands.com/prod	ucts/controls/nlight.
WallPod statio	onsModel number	Occupancy sensors	Model number
On/Off	nPODM [color]	Small motion 360°, ceiling (PIR/	nCM 9 RJB / nCM PD1
On/Off &	nPODM DX	ይዘብታ የአትው tion 360°, ceiling (PIR /	ACMB0 RJB / nCM PD
<b>Giap/Inv</b> ver	(APPOD) GFX	wal south with raise/lower	ANS PDT LV DX
<b>PNGtocer</b> en	Moldel number	Cat-5 cable (plenum rated)	Moldel number
rontrolge	nCM ADCX RJE	310' cable	CAT5 10FT J1
dimming		30' cable	CAT5 30FT J1

nLight® AIR Control Ac Order as separate catalo	cessories: number. Visit www.acuitybrands.com/products/controls/nlighta	ir.
Wall switches	Model number	
On/Off single pole	rPODB [color]	
On/Off two pole	rPODB 2P	
[color] On/Off & raise/lov	er single pole	
	rPODB DX	
[color] On/Off&raise/low	er two pole	
Notes and the second se	lowef BBB BZ Ble	

 $1\ \ Can only be ordered with the RES7Z zone control sensor version.$ 

Replacement Parts: Order as separate ca	atalog number.
*237LJR 2DBLT24 ADP LENS ASTEMBLY 2DBLT24 SDP LENS ASTEMBLY 2DBLT24 ADSM LENS ASTEMBLY 2DBLT24 ADSM LENS ASTEMBLY 2DBLT24 ADPT LENS ASTEMBLY 2DBLT24 ADPT LENS ASTEMBLY 2DBLT24 ADSMT LENS ASTEMBLY 2DBLT24 ADSMT LENS ASTEMBLY 2DBLT24 ADPT SENSOR ASTEMBLY 2DBLT24 ADSMT SENSOR ASTEMBLY 2DBLT24 ADSMT SENSOR ASTEMBLY 2DBLT24 ADSMT SENSOR	2 ft. replacement lens (light traps intluces) comment lens (trims included) 2 ft. replacement lens (trims included)



G

Fax: 770-929-8789

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2BLT-2X2

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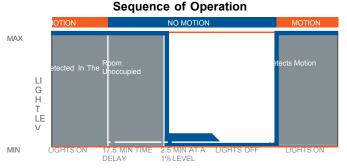
# 2BLT Volumetric Recessed Lighting 2'x2'

Sensor Options						
Option	Automatic Dimming	Occupancy Separating PDT		nLight Wired	nLight AIR	nLight AIR
MSD7ADCX	Photocell	X		Networkin	Networki	zone
MSDPDT7A		10	X			
DCNES7		X		Х	•	
NES7ADCX	Х	X		Х		
NESPDT7	whiled Relight	Kit.	X	-XOLD	Switch	
NESPDT7A	X	1.44	X	X	M DY	
RÉ87N	Х	Х		paron	X	
RES7Z	Х	Х				X

#### Integrated Sensor with Individual Control

The MSD7ADCX PIR occupancy sensor/automatic dimming photocell is ideal for areas without obstructions and where daylight harvesting may be desired. Suggested applications include, but not limited to, hallways, corridors, storage rooms, and breakrooms or other areas where people are typically moving.

The MSDPDT7ADCX PIR/Microphonics Dual Tech occupancy sensor/automatic dimming photocell is ideal for areas with obstructions and where daylight harvesting is desired. Suggested applications include, but not limited to, open offices, private offices, classrooms, public restrooms, and conference rooms.

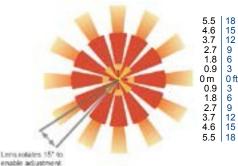


\*The presetting on the automatic dimming photocell is 5fc.

#### Sensor Coverage Pattern Mini 360° Lens

- Recommended for walking motion detection from mounting heights between 8 ft (2.44 m) and 20 ft (6.10 m)
- Initial detection of walking motion along sensor axes at
- distances of 2x the mounting height up to 15 ft (4.57 m) and  $\bullet\,1.75x\,up\,to\,20\,ft\,(6.10\,m).$ 
  - Provides 12 ft (3.66 m) radial detection of small motion when mounted at 9 ft (2.74 m)
  - Initial detection will occur earlier when walking across sensor's field of view than when walking directly at sensor

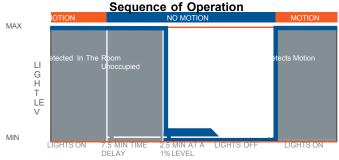
#### 9 FT Mounting



# nLight Wired Networking

The nES 7 is ideal for small rooms without obstructions or areas with primarily walking motion. Ideal areas include hallways, corridors, storage rooms, and breakrooms. Additionally, the NES7ADCX includes an integrated photocell, which enables daylight harvesting controls.

For areas like restrooms, private offices, open offices, conference rooms or any space with obstructions, the nES PDT7 dual technology sensor is recommended. The nES PDT7 utilizes both PIR (passive infrared) and Microphonics technologies to detect occupancy. Additionally, the NESPDT7ADCX includes an integrated photocell, which enables daylight harvesting controls which is ideal for areas where windows are present.



\*The presetting on the automatic dimming photocell is 5fc.

#### nLight AIR Wireless

nLight AIR is the ideal solution for retrofit or new construction spaces where adding additional wiring can be labor intensive and costly. The integrated rES 7 smart sensor is part of each luminaire in the nLight AIR network, which can be grouped to control multiple luminaires. The granularity of control with the digital PIR occupancy detection and daylight sensing makes a great solution for any application.







#### Simple as 1,2,3

EI (

- 1. Install the <code>nLight\_</code> AIR fixtures with embedded smart sensor
- 2. Install the wireless battery-powered wall switch
- With CLAIRITY app, pair the fixtures with the wall switch and if desired, customize the sensor settings for the desired outcome





nLight AIR rPODB 2P DX

Mobile Device

#### Basic nLight Zone





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2BLT-2X2

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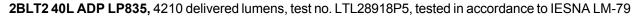
# 2BLT Volumetric Recessed Lighting 2'x2'

# PHOTOMETRICS

180°

2BLT2 33L ADP LP835, 3241 delivered lumens, test no. LTL28918P4, tested in accordance to IESNA LM-79

			-+-						c	oef	ficien	ts of I	Jtiliz	ation							
			- 1I	000	CP S	Summar	y pf						209	%				Zonal Lu	men Sum	mary	
		1-1	Ţ	90			рс			80				1%		50					
80°		T	+-			0°	90	pw	70%	50%	30%	50%3	30%	10%	50%3	0%10	)%	Zone	Lumens	s % Lamp	% Fixture
200	$\Pi / / X$	$\mathcal{N}$	ł	0'	°1	114	1114	0	119 11	9 1	19	116	116	116	111	111	111	0° - 30°	852	26.3	26.3
	HHY.	K	$\checkmark$	60	5°	1092	1118	1	108 1	03	98	100	96	92	96	92	89	0° - 40°	1385	42.7	42.7
400	$   \rangle \rangle$	$\mathcal{S}\mathcal{P}$	$\langle \ \rangle$		15°	1042	1075	2	98	89	82	87	80	75	83	78	73	0° - 60°	2440	75.3	75.3
	HTI	М	$\searrow$		25°	943	996	3	89	78	69	76	68	62	73	66	61	0° - 90°	3242	100.0	100.0
600		$\sim V$	$\sim$		35°	808	891	4 <sub>R</sub>	81	69	60	67	59	52	65	57	52	90° - 180°	0	0.0	0.0
	HT	<u>y</u> 2	X		45°	653	770	<sup>4</sup> R 5C	75	61	52	60	52	45	58	50	44	0° - 180°	3242	100.0	100.0
800		K	$\sim$		55°	492	638	6	69	55	46	54	46	39	52	45	39				
		<ul> <li>\.</li> </ul>	$\sim$	40	65°	334	501	7	64	50	41	49	41	35	48	40	34				
1000	المتجعيد				75°	177	359	8	59	46	37	45	37	31	44	36	31				
0°		20°	<u> </u>		85°	44	147	9	56	42	34	41	33	28	40	33	28				
0		20			90	5	2	10	52	39	31	38	30	25	37	30	25				
	0°		90°																		

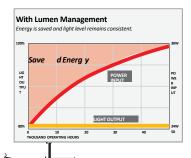


180°								Coef	ficien	nts of	Utili:	zation	ı I						
	WXX	A	90			pf					209	6							
	4 F F F		° CP S	ummar	y	рс		80	%		70	%		50	%	Zonal	Lumen Sı	immary	
80°				0°	90	рм	/ 70%	50%	30%	50%	30%1	0%	50%3	0%10	0%	Zone	Lumer	is % Lam	p % Fixture
200	HIXX	7-	0° 14	47	1447	0	119 11	9 11	9	116	6116	116	111	111	111	0° - 30°	1107	26.3	26.3
400	THX XV	$\prec$	5° 14	19	1452	1	108 10	3 9	В	100	96	92	96	92	89	0° - 40°	1799	42.7	42.7
	TITY X	$\times$	60 15°	1354	1396	2	98	89	82	87	80	75	83	78	73	0° - 60°	3169	75.3	75.3
600	HIVIN	$( \times$	° 25°	1224	1294	3	89	78	69	76	68	62	73	66	61	0° - 90°	4211	100.0	100.0
800	HTX	Х	35°	1050	1158	ŧ	81	69	60	67	59	52	65	57	52	90° - 180°	0	0.0	0.0
1000	LIVA	$\langle \rangle$	45°	849	1001	5 <sup>C</sup>	75 6	15	26	50 52	2 45	5 5	8 50	44		0° - 180°	4211	100.0	100.0
1000		$\times$	55°	640	829	6	69	55	46	54	46	39	52	45	39				
1200	HXX		65°	434	650	7	64	50	41	49	41	35	48	40	34				
1400	Later )	< 1	<sup>10°</sup> 75°	230	466	8	59	46	37	45	37	31	44	36					
			85°	57	191	9	56	42	34	41	33	28	40	33					
	20°		90	7	3	10	52	39	31	38	30	25	37	30	25				
	0°	0°																	

# Constant Lumen Managemer

Enabled by the embedded nLight control, the BLT actively tracks its run-time and manages its light source such that constant lumen output is maintained over the system life. Referred to as lumen management, this feature eliminates the energy waste created by the traditional practice of over-lighting





P	erformar	nce Data							
Lumen Package	Lumens	Input Watts	LPW						
20L ADP LP830	2157	20	110						
20L ADP LP835	2213	20	113						
20L ADP LP840	2261	20	116						
20L ADP LP850	2373	20	121						
33L ADP LP830	3160	30	106						
33L ADP LP835	3241	30	108						
33L ADP LP840	3313	30	111						
33L ADP LP850	3476	30	116						
40L ADP LP830	4103	39	106						
40L ADP LP835	4209	39	108						
40L ADP LP840	4302	39	111						
40L ADP LP850	4514	39	116						
AIR 20L ADP	2019	20	103						
AFR 20LADP	2060	20	105						
ATR 20LADP	2116	20	108						
AFR 20L ADP	2134	20	109						
AFR 39LADP	2957	28	104						
A¶R€393LADP	3017	28	107						
AR 33LADP	3099	28	109						
ATR 39LADP	3126	28	110						
AR 40L ADP	3841	39	99						
ATR 40L ADP	3919	39	101						
ARA 40L ADP	4025	39	104						
AR 40LADP	4060	39	104						

HE Performance Data								
Lumen Package	Lumens	Input Watts	LPW					
33LHE ADP	3537	28	126					
5889 EADP	3628	28	130					
588AE ADP	3708	28	132					
SBEADP	3708	28	139					
40844 ADP	4118	32	127					
40899E ADP	4224	32	131					
40895 ADP	4317	32	134					
408412 ADP	4530	32	140					
488999 ADP	4699	37	128					
48899 ADP	4820	37	131					
488êĤ€ ADP	4927	37	134					
48841E ADP	5169	37	140					

MOUNTING DATA								
Ceiling Type	Appropriat e Trim							
Exposed	Туре	İ						
grid tee (1'	G							
and 9/16") Concealed grid tee	G							
Plaster or	G*							
plasterboard 9/16	15/16	1						

Screw Slot

\*DGA accessory available to provide ceiling trim flange and fixture support for plaster or plasterboard ceiling. Recommended rough-in dimensions for DGA installation is 24-3/4" x 24-3/4" (Tolerance is +1/8", -0").





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2BLT-2X2

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Rev. 10/06/16



# **FEATURES & SPECIFICATIONS**

INTENDEDUSE — The 2GTLLED recessed troffer offers awide range of lumen packages, color temperatures, and lens options to meet the lighting needs for a wide range of applications such as schools, offices, and hospitals. The light engine delivers long life and excellent color to ensure a sound quality, low-maintenance lighting installation. Certain airborne contaminants can diminish integrity of acrylic. Click here for Acrylic Environmental Compatibility table for suitable uses.

CONSTRUCTION - Housing formed from 22 gauge cold-rolled steel. Smooth hemmed sides and smooth inward formed end flanges for safe handling. Lighterweight fixture allows for safe, easy installation.

**OPTICS** — Highly transmissive pattern #12 lens diffuses the light source without compromising output. Pattern #19 and satin white lens options also available.

ELECTRICAL - Long-life LEDs, coupled with high-efficiency drivers, provide extended service life. 90%

LED lumen maintenance at 60,000 hours (L90/60,000).

eldoLED driver options deliver choice of dimming range, and choices for control, while assuring flicker-free, low-current inrush, 89% efficiency and low EMI.

Optional nLight® embedded controls make each luminaire addressable - allowing it to digitally communicate with other nLight enabled controls such as dimmers, switches, occupancy sensors and photocontrols. Simply connect all the nLight enabled control devices and the GTL luminaires using standard Cat-5 cabling. Unique plug-and-play convenience as devices and luminaires automatically discover each other and selfcommission.

Lumen Management: Unique lumen management system (option N80) provides onboard intelligence that actively manages the LED light source so that constant lumen output is maintained over the system life, preventing the energy waste created by the traditional practice of over-lighting.

The step-level dimming option (SLD) allows the system to be switched to 50% power for compliance with common energy codes while maintaining fixture appearance.

Ballast disconnect is provided where required to comply with U.S. and Canadian codes.

**INSTALLATION** — LED boards include plug-in connectors for easy of upgradeability. Suitable for direct

insulation contact.

LISTINGS — CSA certified to meet U.S. and Canadian standards. IC rated. DesignLights Consortium® (DLC) qualified product. Not all versions of this product may be DLC Actual performance may differ as a result of end-user qualified. Please check the DLC Qualified Products List at w w environment and application. Note: Specifi ations subject to w.designlights.org/QPL to confirm which versions are qualified.



All dimensions are inches (centimeters) unless otherwise indicated.

WARRANTY — 5-year limited warranty. Complete warranty terms located at www.acuitybrands.com/CustomerResources/Terms\_and\_conditions.aspx

change without notice.

# ORDERING INFORMATIC

Lead times will vary depending on options selected. Consult

#### Example: 2GTL 2 33L EZ1

2GTL								
Series	Length	Trim type	Lumens1	Door	Lens	Voltage	Driver	Color
2GTL 2' wide recessed LED luminaire	2 2'	(blank) Grid F Overlapping flange	20L 2000 lumens 33L 3300 lumens 40L 4000 lumens	(blank) Flush steel, white FN Flush aluminum, natural FM Flush aluminum, matte black FW Flush aluminum, white RN Regressed aluminum, natural RM Regressed aluminum, matte black	(blank) #12 pattern acrylic, 0.125" thick A19 #19 pattern acrylic SWL Satin white	r r	dims to 1% SLD Step- level dimming₃	temperature LP830 3000K LP835 3500K LP840 4000K LP850 5000K

Controls	3	Options	
(blank) N80 S S N100 N100EM G	No controls nLight with 80% (L80) lumen management nLight with 80% (L80) lumen management for use with generator supply emergency power nLight without lumen management nLight without lumen management for use with generator supply emergency power	EL7L EL14L CP PWS1836 PWS184 6 ABC GLR GLR GMF LATC NPLT PAF	700 lumen emergency battery <sub>4</sub> 1400 lumen emergency battery <sub>4</sub> Chicago plenum 6' pre-wire, 3/8" diameter, 18-gauge, 1-circuit 6' pre-wire, 3/8" diameter, 18-gauge, 2-circuit Door frame gasketing $_{\rm S}$ Slow-blowing fuse <sub>6</sub> Fast- blowing fuse <sub>6</sub>

LED

Γ

ccessories: Order as separate catalog number.

DGA22 Drywall grid adapter for 2x2 recessed fixture.

1 Approximate lumen output. Lumen output will vary depending upon lens option chosen.

Not available with EL7L, EL14L, or SLD.

- 8 Not available with EL7L or EL14L.
- 4 When using pre-wire option, use PWS1846.
- 5 Only available with aluminum door.
- 6 Must specify voltage, 120 or 277.

2GTL

# 2GTL LED Troffer

Pe	Performance Data							
Lumen Package	Input Watts	Lumens	LPW					
20L LP830	19.6	1981.2	101.08					
20L LP835	19.6	2080.3	106.14					
20L LP840	19.6	2179.4	111.19					
20L LP850	19.6	2215	113.01					
33L LP830	35.4	3300.7	93.24					
33L LP835	35.4	3453.3	97.55					
33L LP840	35.4	3619.7	102.25					
33L LP850	35.4	3645.5	102.98					
40L LP830	39.6	3530.6	89.16					
40L LP835	39.6	3704.9	93.56					
40L LP840	39.6	3883.2	98.06					
dol LP850	39.6	3994.2	100.86					

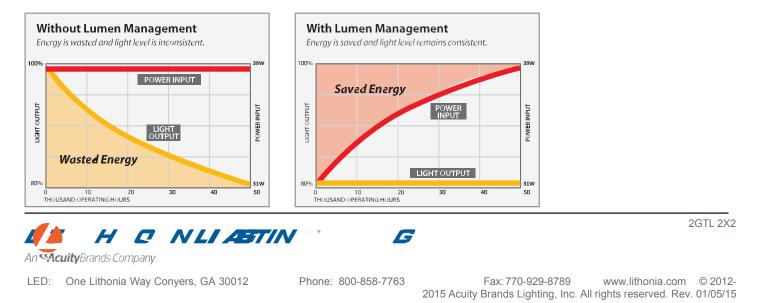
# PHOTOMETRICS

2GTL2 33L EZ1 LP835, 3453 delivered lumens, test no. LTL26153P5, tested in accordance to IESNA LM-79.

180° **Coefficients of Utilization** pf 20% **CP** Summary Zonal Lumen Summary 90° 80% 70% 50% рс Lumens % Lamp % Fixture 0° Zone 90 80° pw 70%50%30% 50%30%10% 50%30%10% 0° 1518 0 119 119 119 0° - 30° 32.9 1518 116 116 116 111 111 111 1136 32.9 300 1515 1504 1 109 105 101 103 99 96 99 96 93 0° - 40° 1799 52.1 52.1 5° 15° 1433 1434 2 100 93 86 91 85 80 87 82 78 0° - 60° 2889 83.6 83.6 600 25° 1274 1295 3 92 82 75 81 74 68 78 72 67 0° - 90° 3454 100.0 100.0 90° - 180° 900 85 74 65 72 64 59 70 63 58 0 0.0 35° 1056 1081  $^{4}$ R 0.0 78 66 58 0° - 180° 100.0 100.0 45° 795 5<sub>C</sub> 65 57 51 63 56 51 3454 809 55° 540 530 6-73 60 51 59 51 45 57 50 45 1200 65° 328 314 7 68 55 46 54 46 40 52 45 40 75° 176 180 8 63 50 42 49 42 36 48 41 36 1500 0° 20° 9 59 46 38 46 38 33 45 38 33 85° 61 63 56 43 35 35 30 35 30 90 5 10 42 41 3 90° 0°

#### **Constant Lumen Management**

Enabled by the embedded nLight control, the GTL actively tracks its run-time and manages its light source such that constant lumen output is maintained over the system life. Referred to as lumen management, this feature eliminates the energy waste created by the traditional practice of over-lighting.



HES - Executive Summary						
Reverse URCE	HORIZON SOLUTIONS					
Overall System Investment:						
Total Project Investment:	\$99,748.88					
Total Cost Investment:	\$99,748.88					
Project Incentives: (Electric)	<u>\$16,546.53</u>					
Total Net Cost Investment:	\$83,202.35					

# Pricing guaranteed for 45 days from date of proposal

Value Analysis:									
Annual Energy Savings: Monthly Energy Savings: <b>Simple Payback Period (Years):</b>	\$11,251.64 \$937.64 7.39								
Maintenan	Maintenance Savings								
*** Estimated Annual Maintenance Savings: <b>Total Annual Operational Savings:</b> * Sales Tax is on Materials Only.	\$922.63 \$12,174.27								

\*\*\* Maintenance Savings is Estimated and therefore is not used to calculate payback.



# Town of Natick Energy Efficiency Proposal

Location:

Morse Library

Monday, January 23, 2017

Natick, MA

kWh Rate: Primary Contact: Phone:

Jillian Wilson-Martin 508-647-6555 \$

#### 0.17

Measure Description				Project Cost \$	Project Elec Incentives	Project NET Cost \$	Estimated ROI
Lighting Upgrades	17.91	66,186	\$11,251.64	\$99,748.88	\$16,546.53	\$83,202.35	7.39
TOTALS	17.91	66,186	\$11,251.64	\$99,748.88	\$16,546.53	\$83,202.35	7.39

# **Measure Description**

Existing fixtures- The existing fixtures in the common areas are 2L 4ft, 3L 4ft and 4L 8ft indirect/direct hanging fixtures w/F32T8 lamps that Horizon proposes to retrofit with Everline LED tube and LED driver kit. Main and back areas also have 2L 2X2 Parabolic w/FBO31T8 lamps that Horizon proposes to replace with Lithonia 20w LED BLT fixtures w/ intergrated controls. Restrooms have 1L 3ft and 1L 4ft strips that Horizon proposes to retro-fit with Everline LED tube and LED driver kits. Exterior fixtures are 150w MH wallpacks that Horizon proposes to replace with RAB SLIM26 and 250w MH flood fixtures that Horizon proposes to replace with RAB 78w flood fixture.

# **Next Steps**

Develop final project grade proposal for lighting. Confirm applicable EverSource.

Confirm owner project approval and execute contract documents

Preliminary estimate for budgeting purposes only

# HES - Environmental Impact

# Town of Natick

# Environmental Impact

Although it appears innocuous, lighting causes air pollution. Each day, your local power plant will commonly burn coal, oil, and gas to generate electricity for your lighting system as well as for your other electrical needs. While burning these fossil fuels produces a readily available and instantaneous supply of electricity, it also generates air pollutants: carbon dioxide (CO2), sulfur dioxide (SO2), and nitrogen oxides (NOx).

# Air pollution causes global warming, acid rain, and smog.

Each of these pollutants causes environmental damage. Carbon dioxide (CO2) causes global warming, sulfur dioxide (SO2) causes acid rain, and nitrogen oxides (NOx) cause both acid rain and smog.

# Your project will help to decrease air pollution and environmental damage by the following amounts each year:



Removing	59,568	pounds of Carbon Dioxide*
Removing	165,465	grams of Sulfur Dioxide
Removing	383,879	grams of Nitrogen Oxides

# By removing these quantities of pollutants from the air, your project will have the same affect on the environment as:



Planting	15	acres of trees
Removing	9	cars from the road each year or
Saving	6,017	gallons of gasoline each year

Source: U.S. Environmental Protection Agency <u>http://www.epa.gov/climatechange/</u> \*Carbon Dioxide calculation has been modified from EPA calculation to properly reflect the New England power grid

# **HES - Savings Projections (Lighting)**

# **Town of Natick**

Existing Conditions										
Total #		Pre Annual	Pre	Pre Annual	Total Lighting					
of Fixtures/Actions	Pre KW	Demand Charge	Annual KWH	KWH Charge	Cost \$\$					
451	35.37	\$0.00	122,871	\$20,888.13	\$20,888.13					

Proposed Lighting										
Total #		Post Annual	Post	Post Annual	Total Lighting					
of Fixtures/Actions	Post KW	Demand Charge	Annual Kwh	KWH Charge	Cost \$\$					
451	17.46	\$0.00	56,685	\$9,636.49	\$9,636.49					

Demand Savings								
KW Demand Monthly Annual								
Savings	Cost Savings	Cost Savings						
17.91	\$0.00	\$0.00						

KWH Savings								
Annual KWH Monthly Annual								
Savings	Cost Savings	Cost Savings						
66,186	\$937.64	\$11,251.64						

Total Cost Savings							
Monthly	Annual						
Cost Savings	Cost Savings						
\$937.64	\$11,251.64						

Calculated Electric RateAvg KWh. Cost\$0.1700Demand Cost\$0.000

53.87% Reduction in total lighting cost

#### Town of Natick Lighting Worksheet Auditor: Brandon Tibbetts

Sort		Fir	EXISTING	PRODUCT CODE	QTY	E-Watts	Total KW	RUN HRS	kWh Pre	ANNUAL COST \$0.170	PROPOSED	QTY	P-watts Prop RunHRS	TOT	kWh Post	% Sen	Total Post-KWH		IAL COST
			L	E-Code			r.vv	пкэ	Pre	\$0.170	PROPOSED	QTY	Ruinks	NVV	POSI	saving	POSI-KWH	PROP	POSED)
1	Atrium		1L flood w/175w MH	1M01755	6	205	1.23	8760	10.775	\$1,831.72	NEW/RAB/FFLED39/T	6	418.760	0.25	2.155	09	2,155	¢	366.34
2	Community room	Base	2L 2X2 Parabolic w/FBO31	2F32SSE	4		0.24	2080	499	\$84.86	NEW/2X2/LED/20W/BLT	4	201,456	0.08	116	30%		₩ 16 \$	19.80
3	Open area	Base	2L 2X2 Parabolic w/FBO31	2F32SSE	20		1.20	3276	3.931	\$668.30	NEW/2X2/LED/20W/BLT	20	20 3.276	0.40	1,310	00/0	1.310	¢	222.77
4	Meeting Hall	Base	2L 4ft Indirect/Direct w/F32T8	2F32SSE	6	60		2080	749	\$127.30	RB/2L/4FT/LED/TUBE/36W	6	362.080	0.22	449	0%		φ 49 \$	76.38
5	Meeting Hall	Base	4L 8ft Indirect/Direct w/F32T8	4F32SSE	6	112	0.67	2080	1.398	\$237.62	RB/4L/4FT/LED/TUBE/70W	6	702.080	0.42	874	0%		74 \$	148.51
6	Back corridor	Base	2L 2X2 Parabolic w/FBO31	2F32SSE	6		0.36	3276	1,179	\$200.49	NEW/2X2/LED/20W/BLT	6	203,276	0.12	393	0%		93 \$	66.83
7	Archive	Base	2L 4ft industrial w/F32T8	2F32SSE	6	60		1040	374	\$63.65	RB/2L/4FT/LED/TUBE/36W	6	361.040	0.22	225	0%		25 \$	38.19
8	Mens RR	Base	1L 3ft strip w/F25T8	1F25SSE	4	24	0.10	2080	200	\$33.95	RB/1L/3FT/LED/TUBE/11W	4	112.080	0.04	92	0%	5	92 \$	15.56
9	Mens RR	Base	1L 4ft strip w/F32T8	1F32SSE	5	30	0.15	2080	312	\$53.04	RB/1L/4FT/LED/TUBE/18W	5	182,080	0.09	187	0%		87 \$	31.82
10	Womens RR	Base	1L 3ft strip w/F25T8	1F25SSE	4	24	0.10	2080	200	\$33.95	RB/1L/3FT/LED/TUBE/11W	4	112,080	0.04	92	0%	5	92 \$	15.56
11	Womens RR	Base	1L 4ft strip w/F32T8	1F32SSE	5	30	0.15	2080	312	\$53.04	RB/1L/4FT/LED/TUBE/18W	5	182,080	0.09	187	0%	5 1	87 \$	31.82
12	Display cases	Base	1L 4ft strip w/F32T8	1F32SSE	2	30	0.06	3276	197	\$33.42	RB/1L/4FT/LED/TUBE/18W	2	183,276	0.04	118	0%	5 1	18 \$	20.05
13	Lights over magazine rack	Base	4L 8ft wrap w/F32T8	4F32SSE	1	112	0.11	3276	367	\$62.38	RB/4L/4FT/LED/TUBE/70W	1	703,276	0.07	229	0%	2	29 \$	38.98
14	Childrens room	Base	2L 2X2 Parabolic w/FBO31	2F32SSE	39	60	2.34	3276	7,666	\$1,303.19	NEW/2X2/LED/20W/SATIN/LITH	39	203,276	0.78	2,555	0%	2,555	\$	434.40
15	Story hour room	Base	2L 2X2 Parabolic w/FBO31	2F32SSE	10	60	0.60	2080	1,248	\$212.16	NEW/2X2/LED/20W/BLT	10	20 1,456	0.20	291	30%	2	91 \$	49.50
16	Lights under skylights	Base	4L 8ft grated strip w/F32T8	4F32SSE	5	112	0.56	3276	1,835	\$311.88	RB/4L/4FT/LED/TUBE/70W	5	70 3,276	0.35	1,147	0%	1,147	\$	194.92
17	Childrens office	Base	2L 2X2 Parabolic w/FBO31	2F32SSE	8	60	0.48	2080	998	\$169.73	NEW/2X2/LED/20W/BLT	8	20 1,456	0.16	233	30%	2	33 \$	39.60
18	Childrens office RR	Base	2L 2X2 Parabolic w/FBO31	2F32SSE	1	60	0.06	1040	62	\$10.61	NEW/2X2/LED/20W/BLT	1	20 728	0.02	15	30%		15 \$	2.48
19	Restrooms	Base	2L 2X2 Parabolic w/FBO31	2F32SSE	3	60	0.18	2080	374	\$63.65	NEW/2X2/LED/20W/BLT	3	20 1,456	0.06	87	30%		87 \$	14.85
20	Main Area	1st	2L 4ft Indirect/Direct w/F32T8	2F32SSE	11	60	0.66	3276	2,162	\$367.57	RB/2L/4FT/LED/TUBE/36W	11	36 3,276	0.40	1,297	0%	1,297	\$	220.54
21	Main Area	1st	4L 8ft Indirect/Direct w/F32T8	4F32SSE	42	112	4.70	3276	15,410	\$2,619.75	RB/4L/4FT/LED/TUBE/70W	42	703,276	2.94	9,631	0%	9,631	\$	1,637.34
22	Main Area	1st	3L 4ft Indirect/Direct w/F32T8	3F32SSE	34	88	2.99	3276	9,802	\$1,666.30	RB/3L/4FT/LED/TUBE/52W	34	52 3,276	1.77	5,792	0%	5,792	\$	984.63
23	Office staff area	1st	2L 2X2 Parabolic w/FBO31	2F32SSE	20	60	1.20	3276	3,931	\$668.30	NEW/2X2/LED/20W/BLT	20	203,276	0.40	1,310	0%	1,310	\$	222.77
24	Trustees room	1st	4L 8ft Indirect/Direct w/F32T8	4F32SSE	1	112	0.11	2080	233	\$39.60	RB/4L/4FT/LED/TUBE/70W	1	702,080	0.07	146	0%	5 1	46 \$	24.75
25	Rm 121	1st	2L 2X2 Parabolic w/FBO31	2F32SSE	2	60	0.12	2080	250	\$42.43	NEW/2X2/LED/20W/BLT	2	201,456	0.04	58	30%		58 \$	9.90
26	Rm 122	1st	2L 2X2 Parabolic w/FBO31	2F32SSE	2	60	0.12	2080	250	\$42.43	NEW/2X2/LED/20W/BLT	2	201,456	0.04	58	30%		58 \$	9.90
27	Rm 123	1st	2L 2X2 Parabolic w/FBO31	2F32SSE	1	60	0.06	2080	125	\$21.22	NEW/2X2/LED/20W/BLT	1	20 1,456	0.02	29	30%		29 \$	4.95
28	Rm 126	1st	2L 2X2 Parabolic w/FBO31	2F32SSE	4	60	0.24	2080	499	\$84.86	NEW/2X2/LED/20W/BLT	4	20 1,456	0.08	116	30%	1	16 \$	19.80
29	Book mobile workroom	1st	2L 2X2 Parabolic w/FBO31	2F32SSE	10	60	0.60	3276	1,966	\$334.15	NEW/2X2/LED/20W/BLT	10	20 2,293	0.20	459	30%	4	59 \$	77.97
30	Closet	1st	2L 4ft wrap w/F32T8	2F32SSE	1	60	0.06	520	31	\$5.30	RB/2L/4FT/LED/TUBE/36W	1	36 520	0.04	19	0%	5	19 \$	3.18
31	Garage area	1st	2L 4ft industrial w/F32T8	2F32SSE	7	60	0.42	3276	1,376	\$233.91	RB/2L/4FT/LED/TUBE/36W	7	36 3,276	0.25	826	0%	5 8	26 \$	140.34
32	Main Area	2nd	2L 4ft Indirect/Direct w/F32T8	2F32SSE	10	60	0.60	3276	1,966	\$334.15	RB/2L/4FT/LED/TUBE/36W	10	36 3,276	0.36	1,179	0%	1,179	\$	200.49
33	Main Area	2nd	4L 8ft Indirect/Direct w/F32T8	4F32SSE	40	112	4.48	3276	14,676	\$2,495.00	RB/4L/4FT/LED/TUBE/70W	40	703,276	2.80	9,173	0%	9,173	\$	1,559.38
34	Main Area	2nd	3L 4ft Indirect/Direct w/F32T8	3F32SSE	34	88	2.99	3276	9,802	\$1,666.30	RB/3L/4FT/LED/TUBE/52W	34	523,276	1.77	5,792	0%	5,792	\$	984.63
35	RR 2A	2nd	1L 4ft strip w/F32T8	1F32SSE	2	30	0.06	2080	125	\$21.22	RB/1L/4FT/LED/TUBE/18W	2	182,080	0.04	75	0%		75 \$	12.73
36		2nd	1L 4ft strip w/F32T8	1F32SSE	2		0.06	2080	125	\$21.22	RB/1L/4FT/LED/TUBE/18W	2	182,080	0.04	75	0%		75 \$	12.73
37	Teen room	2nd	4L 8ft Indirect/Direct w/F32T8	4F32SSE	6	112	0.67	3276	2,201	\$374.25	RB/4L/4FT/LED/TUBE/70W	6	703,276	0.42	1,376	0%		\$	233.91
38	Teen room	2nd	2L 2X2 Parabolic w/FBO31	2F32SSE	5		0.30	3276	983	\$167.08	NEW/2X2/LED/20W/BLT	5	20 3,276	0.10	328	0%	-	28 \$	55.69
39		2nd	2L 2X2 Parabolic w/FBO31	2F32SSE	28		1.68	3276	5,504	\$935.63	NEW/2X2/LED/20W/BLT	28	20 3,276	0.56	1,835		1,835	\$	311.88
40		2nd	4L 8ft Indirect/Direct w/F32T8	4F32SSE	1	112	0.11	3276	367	\$62.38	RB/4L/4FT/LED/TUBE/70W	1	703,276	0.07	229	0%		29 \$	38.98
41	Staff area	2nd	4L 6ft wallwash w/F25T8	4F25SSE	6	88	0.53	3276	1,730	\$294.05	RB/4L/3FT/LED/TUBE/44W	6	44 3,276	0.26	865	0%		65 \$	147.03
42		2nd	2L 2X2 Parabolic w/FBO31	2F32SSE	4		0.24	2080	499	\$84.86	NEW/2X2/LED/20W/BLT	4	201,456	0.08	116	30%		16 \$	19.80
43	Study/conf room	2nd	2L 2X2 Parabolic w/FBO31	2F32SSE	6		0.36	3276	1,179	\$200.49	NEW/2X2/LED/20W/BLT	6	202,293	0.12	275	30%		75 \$	46.78
44	Mens RR	2nd	1L 4ft strip w/F32T8	1F32SSE	2	30		2080	125	\$21.22	RB/1L/4FT/LED/TUBE/18W	2	18 2,080	0.04	75	0%		75 \$	12.73
45		2nd	1L 4ft strip w/F32T8	1F32SSE 4F25SSE	2		0.06	2080 3276	125	\$21.22	RB/1L/4FT/LED/TUBE/18W	2	18 2,080	0.04	75	0%		75 \$	12.73
46	Staff lounge	2nd 2nd	4L 6ft wallwash w/F25T8		6	88	0.53		1,730	\$294.05	RB/4L/3FT/LED/TUBE/44W	6	44 3,276	0.26	865	0%		65 \$	147.03
47	Staff lounge	2.110	4L 8ft Indirect/Direct w/F32T8	4F32SSE		112	0.11	3276	367	\$62.38	RB/4L/4FT/LED/TUBE/70W	· ·	70 3,276	0.07	229	0%		29 \$	38.98
48	Stairwell Stairwell #1	2nd 2nd	2L 4ft strip w/F32T8 2L 4ft strip w/F32T8	2F32SSE 2F32SSE	4		0.24	8760 8760	2,102	\$357.41	NEW/STR4/BI-LEV/20W-2W/LITHONIA NEW/STR4/BI-LEV/20W-2W/LITHONIA	4	206,132	0.08	491	30%		91 \$	83.40
49		2nd 2nd	2L 4ft strip w/F3218 2L 4ft strip w/F32T8	2F32SSE 2F32SSE	6		0.36	8760 8760	3,154	\$536.11	NEW/STR4/BI-LEV/20W-2W/LITHONIA NEW/STR4/BI-LEV/20W-2W/LITHONIA	6	20 8,760	0.12	1,051		1,051	\$	178.70
50		2110			-	60	0.00		3,154	\$536.11		2	208,760	0.12	1,051	0%	1,051	\$ 04 6	178.70
51	Exterior		1L wallpack w/150w MH	1M0150S 1M0250S	2	190 295	0.38 0.59	4380 4380	1,664 2,584	\$282.95 \$439.31	NEW/RAB/SLIM37/PC	2	37 4,380 81 4,380	0.07 0.16	324 710	0%		24 \$ 10 \$	55.10 120.63
52	Exterior		1L flood w/250w MH	110102505	2 451	295	0.59 35.37	4380	2,584 122,871	\$439.31 \$20,888.13	NEW/RAB/FXLED78/PCS/SF	∠ 451	814,380	0.16	710 56,685	0%	56,685	s	120.63 9,636.49
							F 5.01					101		1.1.70	,000	1		٣	3,000.43

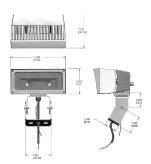
Annual Savings:	\$ 11,251.64
kW Reduced:	17.91
kWh Savings:	66,186

# FFLED39T

Rectangular shaped LED floodlight designed to replace 150W Metal Halide. Patent Pending airflow technology ensures long LED and driver lifespan. Use for building facade lighting, sign lighting, LED landscape lighting and instant-on security lighting. Color: Bronze



Created: 01/23/2015



Heavy-duty Trunnion mount with stainless steel hardware.

#### **Driver Info** LED Info Type: **Constant Current** Watts: 39W 120V: 0.35A 5000K (Cool) Color Temp: 208V: 0.20A Color Accuracy: 65 240V<sup>.</sup> 0.18A L70 Lifespan: 100000 277V: 0.15A LM79 Lumens: 4596 41W Input Watts: Efficacy: 112 LPW Efficiency: 95%

# **Technical Specifications**

**UL Listing:** Suitable For Wet Locations. Suitable for ground mounting.

# Lumen Maintenance:

100,000-hour LED lifespan based on IES LM-80 results and TM-21 calculations.

**IP Rating:** Ingress Protection rating of IP65 for dust and water.

**NEMA Type:** 7H x 6V Beam Spread.

LEDs: Two multi-chip, 26Watt high performance LEDs.

# Driver:

Constant Current, Class 2, 1050mA, 100-277V, 50/60Hz, 0.6A, Power Factor 99%

**THD:** 7.7% at 120V, 6.8% at 277V

Surge Protection: 4kV

**Ambient Temperature:** Suitable for use in 40°C ambient temperatures.

**Cold Weather Starting:** The minimum starting temperature is -40°F/-40°C.

Thermal Management Housing: Superior heat sinking with external Air-Flow fins.

# Mounting:

#### **Color Consistency:**

7-step MacAdam Ellipse binning to achieve consistent fixture-to-fixture color.

# **Color Stability:**

LED color temperature is warrantied to shift no more than 200K in CCT over a 5 year period.

### **Color Uniformity:**

RAB's range of CCT (Correlated Color Temperature) follows the guidelines of the American National Standard for (SSL) Products, ANSI C78.377-2008.

#### Equivalency:

The FFLED39 is Equivalent in delivered lumens to a 150W Metal Halide.

# **Effective Projected Area:**

EPA = 0.65

**Reflector:** Specular vacuum-metallized polycarbonate

#### Gaskets:

High-temperature silicone gaskets.

### Finish:

Our environmentally friendly polyester powder coatings are formulated for high-durability and long-lasting color, and contains no VOC or toxic heavy metals.

# Green Technology:

Mercury and UV free.

# IESNA LM-79 & LM-80 Testing:

RAB LED luminaires have been tested by an independent laboratory in accordance with IESNA LM-79 and LM-80, and have received the Department of Energy Lighting Facts label.



Email: sales@rabweb.com On the web at: www.rabweb.com Note: Specifications are subject to change without notice

Page 1 of 2

FFLED39T - continued

# California Title 24:

Select an FFLED39 model equipped with 0-10V driver (look for /D10 in the catalog #) for a 2013 California Title 24 compliant model.

# Warranty:

RAB warrants that our LED products will be free from defects in materials and workmanship for a period of five (5) years from the date of delivery to the end user, including coverage of light output, color stability, driver performance and fixture finish.

# Patents:

The FFLED design is protected by U.S. Pat. D643,147, Canada Pat. 140798, China Pat. ZL201130171304.1, Mexico Pat. 36757 and pending patent in Taiwan.

# Threaded Size:

1/2" threaded arm.

# **DLC Listed:**

This product is on the Design Lights Consortium (DLC) Qualified Products List and is eligible for rebates from DLC Member Utilities.

# **Country of Origin:**

Designed by RAB in New Jersey and assembled in the USA by RAB's IBEW Local 3 workers.

# **Buy American Act Compliant:**

This product is a COTS item manufactured in the United States, and is compliant with the Buy American Act.

# **Recovery Act (ARRA) Compliant:**

This product complies with the 52.225-21 "Required Use of American Iron, Steel, and Manufactured Goods-- Buy American Act-- Construction Materials (October 2010).

# Trade Agreements Act Compliant:

This product is a COTS item manufactured in the United States, and is compliant with the Trade Agreements Act.

# GSA Schedule:

Suitable in accordance with FAR Subpart 25.4.

Created: 01/23/2015



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Page 2 of 2

#### Created: 02/23/2015

FXLED78T

High power, wide distribution LED floodlight. Replaces 250W MH. Patent Pending airflow technology ensures long LED and driver lifespan. Use for building facade lighting, sign lighting, LED landscape lighting and instant-on security lighting.

LED Info		Driver Info	Driver Info						
Watts:	78W	Type: 120V:	Constant Current 0.66A						
Color Temp: Color Accuracy:	5100K (Cool) 67	208V:	0.41A						
L70 Lifespan:	100000	240V:	0.35A						
LM79 Lumens: Efficacy:	7597 97 LPW	277V: Input Watts:	0.30A 79W						
Lincacy.	31 LF VV	Efficiency:	99%						

# Technical Specifications

#### UL Listing:

Suitable for wet locations. Suitable for ground mounting.

#### Lifepsan:

100,000-hour LED lifespan based on IES LM-80 results and TM-21 calculations.

#### **IP Rating:**

Ingress Protection rating of IP66 for dust and water.

#### EPA:

2

**NEMA Type:** 6H x 5V Beam Spread.

# **Replacement Range:**

The FXLED78 can be used to replace 150 - 320W Metal Halide Floodlights based on delivered lumens.

#### LEDs:

Six multi-chip, 13Watt high-output, long-life LEDs.

#### Driver:

Constant Current, Class 2, 2000mA, 100-277V, 50-60Hz, 1.1A, Power Factor 99%

**THD:** 5% at 120V, 13.1% at 277V

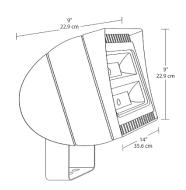
Surge Protection: 4kV

Ambient Temperature: Suitable for use in 40°C ambient temperatures.

# **Cold Weather Starting:**

Color: Bronze





Weight: 24.0 lbs

The minimum starting temperature is -40°F/-40°C.

#### Thermal Management:

Superior heat sinking with external Air-Flow fins.

### Housing:

Die-cast aluminum housing and door frame.

### Mounting:

Heavy-duty Trunnion mount with stainless steel hardware.

### **Color Consistency:**

7-step MacAdam Ellipse binning to achieve consistent fixture-to-fixture color.

### **Color Stability:**

LED color temperature is warrantied to shift no more than 200K in CCT over a 5 year period.

### **Color Uniformity:**

RAB's range of CCT (Correlated Color Temperature) follows the guidelines of the American National Standard for (SSL) Products, ANSI C78.377-2008.

### Equivalency:

The FXLED78 is Equivalent in delivered lumens to a 250W Metal Halide.

**Reflector:** Specular vacuum-metallized polycarbonate

#### Gaskets:

High-temperature silicone gaskets.

#### Finish:

Our environmentally friendly polyester powder coatings are formulated for high-durability and long-lasting color, and contains no VOC or toxic heavy metals.

#### Green Technology:

Mercury and UV free.



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Page 1 of 2

FXLED78T - continued

# IESNA LM-79 & LM-80 Testing:

RAB LED luminaires have been tested by an independent laboratory in accordance with IESNA LM-79 and LM-80, and have received the Department of Energy Lighting Facts label.

### California Title 24:

See FXLED78SF/D10, FXLED78SF/BL, FXLED78SF/PCS or FXLED78SF/PCS2 (277V) for a 2013 California Title 24 compliant product. Any additional component requirements will be listed in the Title 24 section under technical specifications on the product page.

#### Warranty:

RAB warrants that our LED products will be free from defects in materials and workmanship for a period of five (5) years from the date of delivery to the end user, including coverage of light output, color stability, driver performance and fixture finish.

#### Patents:

The FXLED78 design is protected by U.S. Pat. D659,280, Canada Pat. 143155, China Pat. ZL201130443125.9, Mexico Pat. 36558 and pending patent in Taiwan.

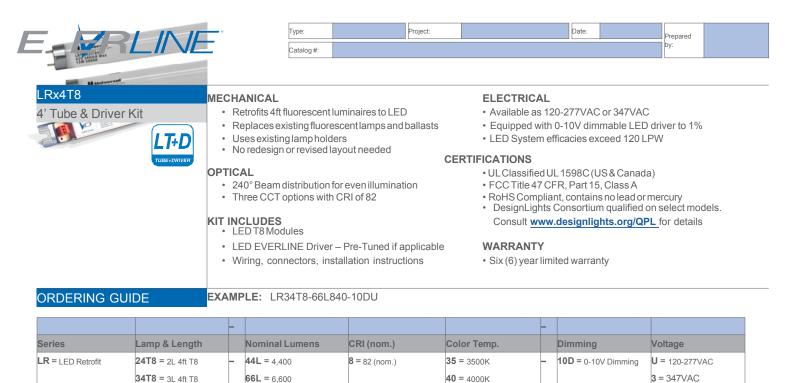
#### DLC Listed:

This product is on the Design Lights Consortium (DLC) Qualified Products List and is eligible for rebates from DLC Member Utilities. Created: 02/23/2015



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Page 2 of 2



**50 =** 5000K

#### **ORDERING NOTES**

1. Orders are shipped in bundled quantities of 10 drivers and the corresponding number of tubes

#### DesignLights Consortium™ QPL Listed Products

44T8 = 4L 4ft T8

	Model Number (2-Tube)	Model Number (3-Tube)	Model Number (4-Tube)
	LR24T8-44L835-10DU	LR34T8-66L835-10DU	LR44T8-88L835-10DU
120-277V	LR24T8-44L840-10DU	LR34T8-66L840-10DU	LR44T8-88L840-10DU
	LR24T8-44L850-10DU	LR34T8-66L850-10DU	LR44T8-88L850-10DU
	LR24T8-44L835-10D3	LR34T8-66L835-10D3	LR44T8-88L835-10D3
347V	LR24T8-44L840-10D3	LR34T8-66L840-10D3	LR44T8-88L840-10D3
	LR24T8-44L850-10D3	LR34T8-66L850-10D3	LR44T8-88L850-10D3

88L = 8,800

CASILED

PERFORM	MANCE DAT	Performance data provided at 3500K.									
Lumen		Input Power	Input Current			LRK System		Reference Luminaire		<ul> <li>Reference Luminaire testing conducted by NVLAP accredited lab in accordance with</li> </ul>	
	Package	(watts)	@120V	@ 277V	@ 347V	Delivered Lm (nom.)	LPW	Delivered Lm (nom.)	LPW	IESNA LM-79.	
LR24T8	44L	36	0.30	0.13	0.10	4400	122	3328	95	Consult factory for photometry.	
LR34T8	66L	52	0.44	0.19	0.15	6600	127	5015	96	Application and performance	
LR44T8	88L	70	0.59	0.26	0.20	8800	126	6616	95	information is subject to change without notification.	

OPERATING DATA	
L70 Lumen Maintenance	>60,000 hrs at 40°C
Min. Starting Temp:	0°F
Sound Rating:	Class A
Power Factor:	>.98
THD:	<20%

LED Driver		
Lm Package	LED Driver -UNV	LED Driver -347
LR24T8-44L	D10CC55UNVTZCP67C	D10CC55347TZCP67C
LR34T8-66L	D10CC55UNVTZ-C10C	D10CC55347TZ-C10C
LR44T8-88L	D21CC80UNVTWDP67C	D21CC80347TWDP66C

\*Projected per IESNATM-21. Data extrapolated based on 10,000 hours of LED testing per IESNALM-80.

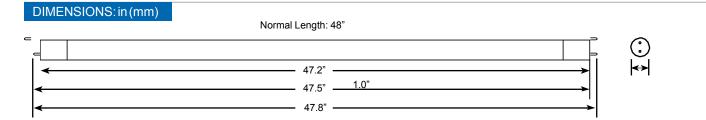
#### Applications

- All LED Tubes must be connected for proper operation.
  Not for use with phase cut dimmers.
  Suitable for 2'x4' with minimum 3" depth, may include a lens, and may be listed for elevated ambients of up to 40°C max in Type Non-IC or up to 25°C max in Type IC.
  Suitable for 4' or 8' strip light, wraparound, and vapor tight (see installation instructions for dimensions and max ambient).

LED Tube	
ССТ	LED T8 Tube
3500K	LRT8M22L/835A
4000K	LRT8M22L/840A
5000K	LRT8M22L/850A

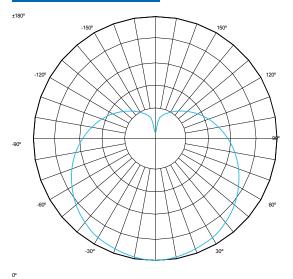
www.unvlt.com Rev. 7/12/16



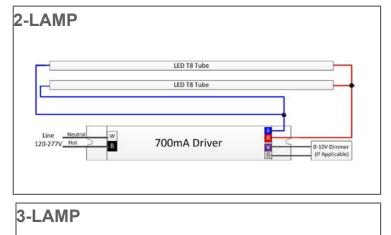


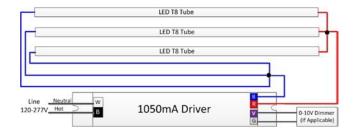
LED Driver Case Dimensions										
Case	Length	Width	Height	Mounting Length	Lead Exit					
С	14.25"	1.18"	1.00"	13.75"	Side					
D	16.88"	1.25"	1.00"	16.28"	Side					

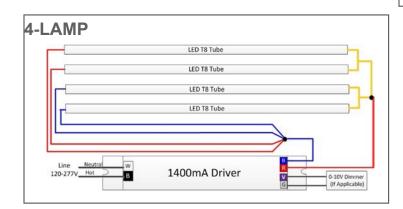
### POLAR DISTRIBUTION



# CONNECTION DIAGRAMS







Wiring Diagrams show existing wire colors from an instant start T8 system

www.unvlt.com Rev. 7/12/16

Universal" Liahting Technologie

# SLIM26N

12, 18 and 26 Watt SLIM wallpacks are ultra efficient and deliver impressive light distribution with a compact low-profile design that's super easy to install as a downlight or uplight.

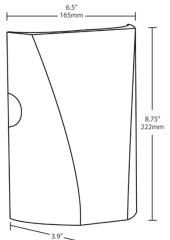
Color: Bronze

Weight: 4.5 lbs

Created: 12/10/2013

LED Info		Driver Info	
Watts: Color Temp: Color Accuracy: L70 Lifespan: LM79 Lumens: Efficacy:	26W 4000K (Neutral) 86 100000 2,111 66 LPW	Type: 120V: 208V: 240V: 277V: Input Watts: Efficiency:	Constant Current 0.27A 0.17A 0.15A 0.13A 32W 81%
		Enciency.	0170





# Ambient Temperature:

Suitable for use in 40°C (104°F) ambiement temperatures.

# **Technical Specifications**

#### UL Listing:

Suitable for wet locations. Suitable for mounting within 1.2m (4ft) of the ground.

#### **IP Rating:**

Ingress Protection rating of IP66 for dust and water.

#### LED:

Multi-chip, long-life LED.

#### Lifespan:

100,000-hour LED lifespan based on IES LM-80 results and TM-21 calculations.

#### Driver:

Constant Current, Class 2, 100-277V, 50/60 Hz., 6KV surge protection, 720mA, 100-277VAC 0.4 Amps, Power Factor 99%.

# THD:

12% at 120V

Input Watts: 32W.

Output Lumens: 2,111.

Color Accuracy (CRI): 86 CRI

Correlated Color Temp. (Nominal CCT): 4000K

**Cold Weather Starting:** The minimum starting temperature is -40°F/-40°C.

### Thermal Management:

Superior heat sinking with internal Air-Flow fins.

# Housing:

Precision die-cast aluminum housing.

# Mounting:

Heavy-duty mounting bracket with hinged housing for easy installation.

# Recommended Mounting Height:

Up to 22 ft.

# **HID Replacement Range:**

The SLIM26 can be used to replace 175W MH based on delivered lumens.

# Lens:

Tempered glass lens.

# **Reflector:**

Specular thermoplastic.

# Gaskets:

High-temperature silicone.

# Finish:

Our environmentally friendly polyester powder coatings are formulated for high-durability and longlasting color, and contains no VOC or toxic heavy metals.

# **DLC Listed:**

This product is on the Design Lights Consortium (DLC) Qualified Products List and is eligible for rebates from DLC Member Utilities.

# Dark Sky Approved:

The International Dark Sky Association has approved this product as a full cutoff, fully shielded luminaire.



Email: sales@rabweb.com On the web at: www.rabweb.com Note: Specifications are subject to change without notice

Page 1 of 2

SLIM26N - continued

# **Color Consistency:**

3-step MacAdam Ellipse binning to achieve consistent fixture-to-fixture color.

#### **Color Stability:**

LED color temperature is warrantied to shift no more than 200K in CCT over a 5 year period.

### **Color Uniformity:**

RAB's range of CCT (Correlated Color Temperature) follows the guidelines for the American National Standard for Specifications for the Chromaticity of Solid State Lighting (SSL) Products, ANSI C78.377-2011.

### Green Technology:

Mercury and UV free, and RoHS compliant.

### IESNA LM-79 & LM-80 Testing:

RAB LED luminaires have been tested by an independent laboratory in accordance with IESNA LM-79 and LM-80, and have received the Department of Energy "Lighting Facts" label.

#### Patents:

The design of the SLIM<sup>™</sup> is protected by patents in

U.S. Pat D681,864, and pending patents in Canada, China, Taiwan and Mexico.

#### **Country of Origin:**

Designed by RAB in New Jersey and assembled in the USA by RAB's IBEW Local 3 workers.

#### **Buy American Act Compliant:**

This product is a COTS item manufactured in the United States, and is compliant with the Buy American Act.

#### **Recovery Act (ARRA) Compliant:**

This product complies with the 52.225-21 "Required Use of American Iron, Steel, and Manufactured Goods-- Buy American Act-- Construction Materials (October 2010).

## **Trade Agreements Act Compliant:**

This product is a COTS item manufactured in the United States, and is compliant with the Trade Agreements Act.

#### **GSA Schedule:**

Suitable in accordance with FAR Subpart 25.4.

Created: 12/10/2013



Email: sales@rabweb.com On the web at: www.rabweb.com Note: Specifications are subject to change without notice

Page 2 of 2



# **FEATURES & SPECIFICATIONS**

 $\label{eq:intermediate} \textbf{INTENDED USE} - For wall or ceiling mounting, vertical or horizontal. The WL combines digital LED lighting$ 

and controls technologies with high-performance optical design to offer the most advanced wall-mount luminaire for general ambient lighting applications. High-efficacy light engine delivers long life and excellent color, ensuring a superior quality lighting installation that is highly efficient and sustainable.

CONSTRUCTION - H ousing is roll formed from code-gauge steel.

Impact modified linear-faceted refractor with light diffusing film. Refractor is retained in die cast ends providing secure installation and easy maintenance.

Decorative die-cast end caps provide added durability.

Finish: All metal parts are post-painted in white polyester powder coat for smooth, finished edges and uniform light distribution.

**OPTICS** — High impact acrylic diffuser with light diffusing film. Optically engineered for superior light distribution and maximum efficacy.

Crescent-shape linear faceted refractor system obscures and integrates individual LED images and uniformly

#### washes fixture surface with light.

**ELECTRICAL** — Long-life LEDs, coupled with high-efficiency drivers, provide superior quantity and quality of illumination for extended service life. WL is rated to deliver L80 performance for 50,000 hours.

Optional nLight<sup>m</sup> embedded controls continuously monitor system performance and allow for constant lumen management / compensation function.

Lumen Management: Unique lumen management system (option N80) provides onboard intelligence that actively manages the LED light source so that constant lumen output is maintained over the system life, preventing energy waste created by the traditional practice of over-lighting.

LED AccuDrive <sup>™</sup> driver delivers full-range dimming from 0-10V control signal.

Integral occupancy control: Sensor Switch nES 7 or nES PDT 7 integrated occupancy sensor allows luminaire to power off or dim to 10% to 50% output when space is unoccupied. Fixture designed to fail on.

The nES 7 is ideal for small rooms without obstructions or areas with primarily walking motion (e.g. corridors,

stairwells). Additionally, an optional integrated photocell enables daylight harvesting control as well.

For rooms like restrooms and private offices or any space with obstructions, the nES PDT7 dual technology sensor is recommended.

Driver disconnect provided where required to comply with US and

Canadian codes. Maintenance: LED boards include plug-in connectors

for easy replacement or servicing. LISTINGS – CSA certified to meet U.S.

and Canadian standards. Suitable for damp location.



DesignLights Consortium  $^{\otimes}$  (DLC) qualified product. Not all versions of this product may be DLC qualified.

Please check the DLC Qualified Products List at www.designlights.org/QPL to confirm which versions are qualified.

Patents pending.

WARRANTY — 5-year limited warranty. Complete warranty terms located at www.acuitybrands.com/CustomerResources/Terms\_and\_conditions.aspx

Note: Specifications subject to change without notice.

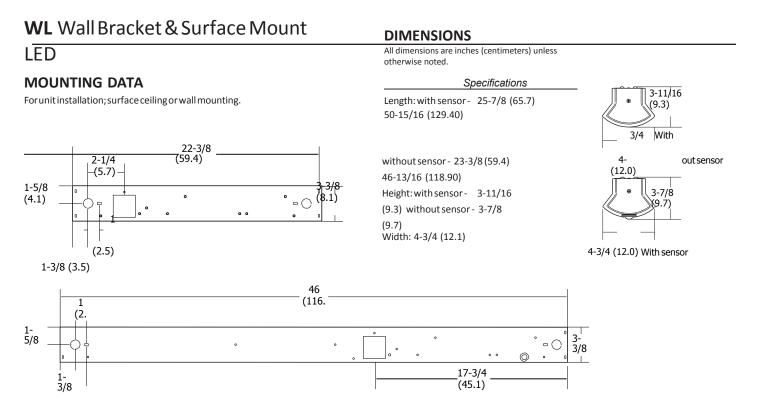
#### ORDERINGINFORMATIC. Lead times will vary depending on options selected. Consult with

#### Example: WL4 25L D24

Series		Lumens₁	Voltage		Wattage	Color temperature	Lumen management
WL2 WL4	4' wall-mount LED	-	r í	V) 347V <sub>6</sub>	D20 20W7 D24 24W7 D43 43W7	LP830 82 CRI, 3000 kelvin <sub>8,9</sub> LP835 82 CRI, 3500 kelvin LP840 82 CRI, 4000 kelvir LP850 82 CRI, 5000 kelvin <sub>8,9</sub>	NXLess nLightN80nLight with 80% (L80) lumenmanagementN80EMGnLight with 80% (L80)lumen management for usewith generator supply EM powerN100nLight with 100% (L100) lumenmanagement
						bidi@@gv/6entigbrtusizhvi00%eti203)brrsepply EM	
Occupancy control <sub>10</sub> Standby mode <sub>12</sub>					12	c	ptions Finish <sub>14</sub>

NES7         Sensor Switch nES 7 PIR integr           occupancy sensor 11 NESPDT7         Sensor Sw           PDT 7 dual technology integral occupancy control 11         NES7ADCX Sensor Switch nES 7 ADCX PIR in occupancy control 11           NES7ADCX Sensor Switch nES 7 ADCX PIR in occupancy construction         Sensor witch automatic dimmm	vitch nES unoccupied DIM10 Fixture dims to 10% when unoccupied DIM50 Fixture dims to 50% when unoccupied tegral	EL14L LED Emergency battery pack (nominal 1400 lumens); see Life Safety section <sub>13</sub> SC Surface conduit end cap provisions
	<ul> <li>Notes         <ol> <li>Approximate lumen                 output.</li> <li>For use with WL2 only, rec                 D13 d</li> <li>For use with WL2 only, rec                 D24 d</li> <li>For use with WL4 only, rec                 D24 d</li> <li>For use with WL4 only, rec                 D24 d</li> <li>For use with WL4 only, rec                 D24 d</li> <li>For use with WL4 only, rec                 D24 d</li> <li>For use with WL4 only, rec                 D24 d</li> <li>For use with WL4 only, rec                 D24 d</li> <li>For use with WL4 only, rec                 D24 d</li> <li>For use with WL4 only, rec                 D24 d</li> <li>For use with WL4 only, rec                 D24 d</li> <li>For use with WL4 only, rec                 D24 d</li> <li>For use with WL4 only, rec                 D24 d</li> <li>For use with WL4 only, rec                 D24 d</li> <li>For use with WL4 only, rec                 D24 d</li> <li>For use with WL4 only, rec                 D24 d</li> <li>For use with WL4 only, rec                 D24 d</li> <li>Not available for use</li></ol></li></ul>	iriver. 11 Requires N80 or N100. 12 Requires occupancy control. 13 Not available with WL2; not available with 347V. 14 For additional paint finishes refer to friver. Architectural Colors. quires friver. y+/- 5% when

WL-



# **PHOTOMETRICS**

WL425L D24 LP835, 2505 delivered lumens, test no. LTL21295, tested in accordance to IESNA LM-79

180°					f		c	Coef	ficie	nts		tilizat	ion						
			<b>Sum</b> 0	-	pf pc 	pw	70%50	80% <u>)%3(</u>		50%		% )% <u>610%</u>	50%		)% 510%	Zone		men Sumn ns_% Lam	nary np_% Fixture
100		0°	684 5°67	684 5 683	1	0 1 103	115 11 98    98	5 11 93	-			) 110 85			102 79	0° - 30° 0° - 40°	525 852	20.9 34.0	20.9 34.0
200	HTX 6					2	93	84	77	81	74	69	75	69	64	0° - 60°	1483	59.2	59.2
300	HTXX	25 35				3 4,	85 77	74 65	65 56	71 63	63 54	57 48	65 58	59 51	54 45	0° - 90° 90° - 120°	2072 227	82.7 9.1	82.7 9.1
400	H	45	369	479		4X000	71	58	49	56	47	41	52	45	39	90° - 130°	297	11.9	11.9
500		55' 65'		400 339		6 <b>)</b> 7	66 61	52 47	43 38	50 46	42 37	36 32	47 43	40 35	34 30	90° - 150° 90° - 180°	392 432	15.6 17.3	15.6 17.3
600	4	0 75 85		331 198	6		57 53	43 39	35 31	42 38	34 31	28 25	39 36	32 29	27 24	0° - 180°	2505	100.0	100.0
0°	20°	90	5	147	-	0	49	36	29	35	28	23	33	27	22				

# **Town of Natick Contract for Services Related to the** LED Retrofit of Morse Institute Library

90° 0°

0,		1	1		Total Lur	ilens w		tioiop	lions				
System	Lamp type	Ballast factor	Input watts	1	tts saved Ising LED				Contr	ol option	า		
LED-N100	LED	1	24		Lumen package	N	N100		N80		n50	Di	m10
LED-N801	LED	1	19			Wattag	Lumens	Wattage	Lumens	Wattage	Lumens	Wattage	Lumens
One-lamp T8	F32T8	0.88	28		3 <sup>12L</sup>	e 13	1200	10	1044	6.5	470	1.3	38
One-lamp T5	F28T5	1	32		7 <sup>18L</sup>	20	1800	16	1566	10	810	2.0	126
I		.[		1	25L	24	2500	19	2175	12	1125	2.4	175
te					41L	43	4100	34	3567	22	1845	4.3	330

1 With nlight 80% lumen management input watts start at 19 and gradually increasing to 24 at 50,000 hrs.



WL-LED

LED: One Lithonia Way Conyers, GA 30012Phone: 800.858.7763 Fax: 770-929-8789 © 2012-2014 www.lithonia.com

### Town of Natick Contract for Services Related to the Energy Reduction Project at the Police Station

This Agreement is made this \_\_\_\_\_day of \_\_\_\_\_, 2018, by and between the Town of Natick with an address of Natick Town Hall, 13 East Central Street, Natick, MA 01760, by the Natick Board of Selectmen (hereinafter the "Town," or the "Client"), and Hobart Energy Services, Inc., a corporation with a principal place of business at 30 Crescent Dr. Salem, MA (hereinafter the "Contractor").

The words "he," "him" and "his" in this Agreement, as far as they refer to the Contractor, shall so refer whether the Contractor is an individual, partnership or corporation. All prior contracts, if any exist between the Town and the Contractor, are hereby terminated and shall be of no force and effect.

# 1. Scope of Services and Scheduling

In consideration of the obligations herein contained, Contractor shall perform the work included in the scopes of work in the B2Q proposals dated March 8, 2018 (the "Project"), which is attached hereto and incorporated herein by reference. All materials shall be new and shall meet UL, Federal, State and Local code requirements. Any material change to the scope of work, including acceptance of the additional cost for the work, shall be agreed upon by both parties in writing before the work is performed. The work will be considered complete, with the exception of any minor open items, after the Client and Utility representative review and approval of the work (herein referred to as the "certificate of completion").

Contractor provides this proposal based on Prevailing wage requirements, if applicable, and all work performed during normal work week (6:00 A.M. to 3:30 P.M. local time), unless otherwise stated in the proposal (subject to M.G.L. c. 149, §34).

Contractor shall install the Project with regard for the appearance and condition of the Client's property. Waste material shall be removed daily.

The Client will cooperate and coordinate with Contractor on scheduling and maximize productivity on Energy Conservation projects. The Client will allow Contractor access to areas of the building to ensure rapid, efficient installation and completion of the Project.

Contractor shall employ the following Subcontractors to accomplish the scope of work.

- B2Q Associates, Inc. (engineering, commissioning, project management)
- Trane Company, Inc. (controls)
- Automated Logic Corporation (controls and electrical contracting)
- Enterprise Equipment Company, Inc. (mechanical contracting)
- New England Ductless (mechanical contracting)
- 2. Standard of Care

\

The Contractor's services shall be performed as expeditiously as is consistent with professional skill and care and the orderly progress of the work. The Contractor shall exercise due care and diligence in the rendition of all services under this Agreement in accordance with the applicable professional standards in the eastern Massachusetts area. The Contractor's services shall be performed as expeditiously as is consistent with such standards.

# Town of Natick Contract for Services Related to the Energy Reduction Project at the Police Station

# 3. Term

The term of this Agreement shall be for one (1) year, commencing as of the execution date of this Agreement, and ending one (1) year later.

# 4. Order of Priority of Agreement Documents

In the event of any conflict among the Agreement Documents, the Documents shall be construed according to the following priorities:

Highest Priority:	Amendments to Agreement (if any)
Second Priority:	Agreement

# 5. Payment

\

In consideration for performance of the work in accordance with the requirements of this Agreement, the Client shall pay Contractor the prices in the Schedule of Values set forth in Exhibit A, which is attached hereto and incorporated by reference.

This Agreement is a fixed price/fixed rate contract; and, therefore, miscellaneous expenditures associated with Contractor's work on the Project shall not be paid by the Client. In the event that an unforeseen miscellaneous expense is incurred, Contractor shall receive the Client's approval in writing prior to incurring the expense if it will subsequently seek payment of said expense from the Client.

Payment shall be made to Contractor for work completed in accordance with this Agreement. All requests for payment shall be submitted to the Client as an invoice and shall specify work completed and progress made toward completing deliverables.

Payment will be due thirty (30) days after receipt of Contractor's invoice by the Client for services rendered in accordance with this Agreement. The Client shall not make payments in advance.

If the Client objects to all or part of any invoice, the Client shall notify the Contractor in writing within two (2) weeks of the date of receipt of the invoice, and shall pay that portion of the invoice not in dispute within thirty (30) days after the date of receipt of the invoice.

Should it be necessary for Contractor to engage the services of a specialized contractor or companies other than those originally proposed in B2Q's proposal, Contractor shall take such measures only with the Client's prior written approval. Charges for such services shall be billed directly to the Client unless otherwise agreed upon by the parties.

Payment of the amounts due under this Agreement shall release the Town of Natick and its officers, employees, boards, commissions, committees, agents and representatives, from any and all claims and liability in any way relating to this Agreement or anything done in pursuance thereof.

No payment by the Client to Contractor shall be deemed to be a waiver of any right of the Client under this Agreement or a ratification by the Client of any breach hereof by

# Town of Natick Contract for Services Related to the Energy Reduction Project at the Police Station

### Contractor.

# 6. Warranty

It is understood and agreed that Contractor will perform all services hereunder in a professional manner with appropriately skilled employees or subcontractors. Contractor warrantees the workmanship for one (1) year from the date of the certificate of completion and shall assign all applicable Manufacturers' warranties for products used on the Project to the Client. Contractor shall also assist in completing all applicable warrantee registration forms and explain the warrantee process for these Manufacturer warranties.

# 7. Compliance with Laws

Contractor shall comply with all provisions of Federal, Massachusetts and Town of Natick law applicable to his work including, without limitation, statutes, by-laws, rules, regulations, orders and directives, as amended, and including, without limitation, the Williams-Steiger Occupational Safety and Health Act, as amended, and related regulations, as amended, in effect throughout the term of this Agreement and any extension or renewal thereof. Without limitation, Contractor shall comply with the provisions of Chapter 149, Section 26 to 27D of the Massachusetts General Laws, as amended, and the applicable minimum wage rates as determined by the Massachusetts Commissioner of Labor and Industries. This Agreement shall be considered to include in their entirety all terms respecting workers' compensation insurance and other terms required to be included in it by Chapter 152 of the Massachusetts General Laws, as amended, as though such terms were set forth in their entirety herein.

# 8. Insurance

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Contractor shall insure and shall require each of its subcontractors to carry the following insurance to the extent stated:

- a. Workers' Compensation Insurance as required by the laws of the Commonwealth of Massachusetts and employer's liability insurance in the amount of \$1,000,000/\$1,000,000.
- b. Commercial General Liability Insurance, \$1,000,000 each occurrence and \$2,000,000 aggregate limit. Commercial General Liability insurance shall include personal injury liability, broad form property damage liability, products/completed operations liability and broad form contractual liability.
- c. Automobile Liability Insurance, covering all non-owned and hired vehicles Combined single limit of \$1,000,000.
- d. Professional Liability Insurance, covering errors and omissions, \$1,000,000 each claim and \$2,000,000 aggregate limit.
- e. Excess Liability Insurance, Umbrella Form \$1,000,000 each occurrence and \$2,000,000 aggregate, which shall be following form, providing coverage over commercial general liability insurance and employer's liability under workers'

compensation insurance.

- f. The Town of Natick shall be named as additional insured on each such policy of Commercial General Liability Insurance and, if required, Automobile Liability Insurance.
- g. All certificates and policies shall contain the following provision:

"Notwithstanding any other provision herein, should any of the above policies be cancelled or materially amended before the expiration date thereof, the issuing company will mail thirty (30) days prior written notice thereof to the named certificate holder and to the Natick Town Administrator, Natick Town Hall, 13 East Central Street, Natick, MA 01760, before such cancellation or amendment shall take place."

- h. Certificates evidencing such insurance in five (5) copies shall be furnished to the Client at the execution of this Agreement. Such certificates shall not merely name the types of policy provided, but shall specifically refer to this Agreement and shall state that such insurance is as required by this Agreement. Contractor shall make no claims against the Town of Natick or its officers for any injury to any of its officers or employees or for damage to its equipment arising out of work contemplated by the Agreement.
- i. Contractor shall also be required to provide to the Town of Natick with its proof of insurance coverage endorsements or riders to the policies of commercial general liability insurance and, if required, automobile liability insurance, which indicate that the Town of Natick are named as additional insureds on each such policy.
- j. No insurance shall be obtained from an insurer which:
  - 1. is not licensed to sell insurance in the Commonwealth of Massachusetts; or

2. is not authorized to provide insurance as an excess or surplus lines insurer, and does not have a current Best's rating of A or better.

- k. Failure to provide and continue in force such insurance as aforesaid shall be deemed a material breach of this Agreement and shall operate as an immediate termination thereof.
- 9. Indemnification

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Contractor shall compensate the Client for all damage to the Client's property of any nature arising out of Contractor's work. To the fullest extent permitted by law, Contractor shall indemnify, defend, and hold harmless the Town of Natick and all of its officers, employees, boards, commissions, committees, agents and representatives from and against all claims, causes of action, suits, costs, damages, and liability of any kind which, to the extent caused by the willful or negligent acts, errors or omissions by Contractor and those of anyone for whom Contractor is legally liable, arise out of the breach by Contractor of its obligations under this Agreement, or the act or omission of Contractor, its subcontractors, or their officers, employees, agents and representatives or anyone directly or indirectly employed by them, or anyone for whose acts or omissions

they may be liable, regarding the work to be performed by Contractor under the Agreement, or which arise out of the violation of any federal, Massachusetts or Town of Natick statute, by-law, rule, regulation, order or directive, or which relate to personal injury or property damage suffered by Contractor or any of its officers, employees, or subcontractors regarding the subject matter of this Agreement. Said costs shall include, without limitation, legal costs, collections fees, and counsel fees incurred in defending any claim or suit that may be brought against the Client and any judgment that may be obtained in any such claim or suit.

#### 10. No Personal Liability

Neither the Town of Natick, nor its officers, employees, boards, committees, commissions, agents and representatives shall be under any personal obligation or incur any personal liability by reason of this Agreement, the execution thereof or anything relating thereto which arises out of the breach or violation of any provision of this Agreement, or the violation of any Federal, Massachusetts or Town of Natick statute, by-law, rule, regulation, order or directive, or which relates to personal injury or property damage suffered by Contractor, its employees, or subcontractors, regarding the subject matter of this Agreement.

#### 11. Familiarity with Area of Work

By signing this Agreement, Contractor acknowledges that it has examined the subject matter of this Agreement, including, without limitation, the provision of energy consulting services, and that it is familiar with all sites which are the subject of this Agreement in the Town of Natick and with all conditions of this Agreement. Contractor has entered into this Agreement in reliance on its own examinations and estimates as to the amount and character of its work, and conditions which may be encountered in the performance thereof, and shall assume all risks and bear all losses pertaining thereto.

The nature of Contractor's work includes the installation of energy efficiency equipment and solutions. Contractor does not take responsibility for the following existing conditions at the Project site: existing code violations, structural issues, deteriorating wiring and hazardous material, such as asbestos, lead paint, and oil. To the extent that Contractor and/or its officers, employees, agents, subcontractors or consultants do not cause the presence of hazardous material at the Project site, Contractor and its officers, employees, agents, subcontractors and consultants shall have no responsibility for the discovery, presence, handling, removal or disposal of, or exposure of persons to, hazardous material in any form at the Project site. If Contractor discovers hazardous material at the Project site, it shall immediately notify the Client in writing and shall refrain from disturbing or taking any action with respect to the hazardous material in the absence of the Client's written direction. In the event Contractor does disturb such hazardous material or does take such action without written direction, the limitation of liability in this paragraph shall not apply.

12. Performance Bond

DELETED – NOT APPLICABLE.

13. Labor and Materials Payment Bond\_

#### DELETED - NOT APPLICABLE.

#### 14. Independent Contractor Status

Contractor shall provide services under this Agreement as an independent contractor with the Town of Natick and not as an employee of the Town. No employee, agent or representative of Contractor shall be entitled to receive any benefits of employment with the Town of Natick, including without limitation salary, overtime, vacation pay, holiday pay, sick leave, health insurance, life insurance, pension or deferred compensation.

#### 15. Use of Alcohol and Controlled Substances Prohibited

Contractor hereby acknowledges that the use of alcoholic beverages, narcotics, and mood altering substances, except for current valid, legal prescriptions, by any officer, employee, agent, or representative of Contractor is prohibited on Town property which is the subject matter of this Agreement and during all hours of work under this Agreement. If any officer, employee, agent, or representative of Contractor violates the foregoing provision, the Client shall have the right to order that such officer, employee, agent, or representative of Contractor shall not be permitted to return to work on this Agreement. Under such circumstances, Contractor shall promptly remove the subject officer, employee, agent, or representative from the job site and shall not permit the subject officer, employee, agent, or representative to perform further work in conjunction with this Agreement.

#### 16. No Smoking

Pursuant to Massachusetts General Laws (M.G.L.) c. 270, §22, the Commonwealth of Massachusetts Smokefree Workplace Law, Contractor, its officers, employees, agents, subcontractors, and representatives shall refrain from smoking and from using tobacco products in any public building in the Town of Natick.

#### 17. Criminal Background Screening

For each employee of Contractor who is performing services under this Agreement, Contractor shall, subject to its confidentiality and privacy obligations owing to its employees and third parties, provide a written confirmation to the Client that such employee passed Contractor's pre-employment criminal background screen. In the event that any employee refuses to permit Contractor to provide such information to the Client, Contractor shall not assign such employee to perform services for the Client, and such employee shall not be authorized to perform services for the Client. The Client shall be permitted to keep such information in its files.

#### 18. Delays/Force Majeure

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Except as specifically set forth in this Agreement, neither party shall hold the other responsible or liable for damages or delays in performance caused by acts of God, interruptions in the availability of labor, or other events beyond the control of the other party, or that could not have been reasonably foreseen or prevented. For this purpose, such acts or events shall include unusually severe weather affecting performance of services, floods, epidemics, wars, riots, strikes, lockouts, or other industrial disturbances,

protest demonstrations, and project site conditions which could not have been reasonably anticipated. Should such acts or events occur, both parties shall use their best efforts to overcome the difficulties arising and to resume as soon as reasonably possible the normal pursuit of the services for the Project.

#### 19. Termination

- a. If Contractor shall breach any provision of this Agreement, which breach is not cured within twenty-one (21) days of written notice thereof from the Client to Contractor, the Client shall have the right to terminate this Agreement upon written notice to Contractor.
- b. If any assignment shall be made by Contractor or by any guarantor of Contractor for the benefit of creditors, or if a petition is filed by Contractor or by any guarantor of Contractor for adjudication as a bankrupt, or for reorganization or an arrangement under any provision of the Bankruptcy Act as then in force and effect, or if an involuntary petition under any of the provisions of the Bankruptcy Act is filed against Contractor and such involuntary petition is not discharged within ninety (90) days thereafter, in any event the Client may terminate this Agreement upon written notice to Contractor.
- c. The award of this Agreement and the continued operation of this Agreement are contingent upon appropriation by Natick Town Meeting of sufficient money to fund the Agreement. Should Natick Town Meeting fail to appropriate necessary funds therefor, the Client shall no longer be under any obligation to tender performance, including payment, under the terms of this Agreement. In that event, the Client may terminate this Agreement upon written notice to Contractor.
- d. The Client may terminate this Agreement upon written notice to Contractor if a source of money to fund the Agreement is lost during the Agreement term. In the alternative, the parties may agree in writing to amend the Agreement to provide for an Agreement price which represents a reduced appropriation for the Agreement term.
- e. The Client may also terminate this Agreement for convenience upon thirty (30) days' written notice to Contractor.

In the event of termination Contractor shall be entitled to be paid for services rendered in accordance with this Agreement prior to termination.

In the event that this Agreement is terminated pursuant to Section a. or b. above, the Client may make any reasonable purchase or contract to purchase services in substitution for services due from Contractor and may deduct the cost of any substitute contract, or damages sustained by the Client due to non-performance or non-conformance of services together with incidental and consequential damages from the Agreement price, and shall withhold such damages from sums due or sums which become due.

20. Notices

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Except as otherwise provided in this Agreement all notices required or permitted to be

given hereunder shall be in writing and shall be delivered by certified mail or registered mail, return receipt requested, to the parties at the following address or such other address or addresses as to which a party shall have notified the other party in accordance with this Section.

If to the Town of Natick:	Melissa A. Malone Town of Natick 13 East Central Street Natick, MA 01760
With copies to:	Karis North, Esq. Murphy, Hesse, Toomey & Lehane, LLP 300 Crown Colony Drive, Suite 410 Quincy, MA 02169
If to Contractor:	Ed Skeffington Hobart Energy Services, Inc. 30 Crescent Dr. Salem, MA 01970

#### 21. Miscellaneous Provisions

- a. Any action at law or suit in equity instituted by Contractor as a result of the performance, non-performance or alleged breach of this Agreement shall be filed in the Superior Court of the Commonwealth of Massachusetts for Middlesex County, MA, and in no other court or jurisdiction.
- b. No action or failure to act by either party shall constitute a waiver of a right or duty afforded to that party under the Agreement, nor shall such action or failure to act constitute approval of or acquiescence in a breach thereunder, except as may be specifically agreed in writing. No forbearance or indulgence in any form or manner by either party shall be construed as a waiver or in any way limit the legal or equitable remedies available to that party. No waiver by either party of any default or breach by the other party shall constitute a waiver of any subsequent default or breach.
- c. If Contractor discovers or is informed of any discrepancy or inconsistency in the Agreement Documents in relation to any law, statute, ordinance, by-law, decree, code, rule, regulation, or order, Contractor shall promptly, before commencing services under this Agreement, report the same to the Client in writing.
- d. Contractor acknowledges that it has not been influenced to enter into this Agreement, nor has Contractor relied upon any warranties or representations not set forth in this instrument.
- e. Contractor shall maintain the confidentiality of information designated by the Client as confidential, unless withholding such information would violate the law or create a risk of significant harm to the public, or unless Contractor has been required to release such information by final judgment or order of a court of competent jurisdiction, or unless the Client has expressly waived such

confidentiality in advance in writing.

- g. Contractor shall not represent or purport to represent that it speaks for the Client vis-à-vis the media or the public at-large without the Client's express, written consent in advance.
- h. Prior to commencing services under this Agreement, Contractor shall furnish the Client, in writing, the names, addresses and telephone numbers of not fewer than two (2) principal employees of his business who are to be contacted in the event of an after-hours emergency.
- i. By entering into this Agreement, Contractor certifies under penalties of perjury that its entry was made and submitted in good faith and without collusion or fraud with any person. As used in this certification, the word "person" shall mean any natural person, business, partnership, corporation, union, committee, club, or other organization, entity, or group of individuals.
- j. By entering into this Agreement, Contractor certifies under the penalties of perjury, pursuant to M.G.L. c.62C, Section 49A(b), that it has complied with all laws of the Commonwealth relating to taxes, to reporting of employees and contractors, and to withholding and remitting child support.
- k. Prevailing wage rates, as contained in the Bid documents, shall be paid, pursuant to M.G.L. c.149, §§26-27G, if they are applicable.
- 1. Contractor understands that the Massachusetts Conflict of Interest Law, Chapter 268A of the Massachusetts General Laws, applies to Contractor with respect to the services required to be provided under this Agreement. Contractor and its officers, employees, agents, subcontractors and affiliated agencies shall not participate in any activity which constitutes a violation of the Massachusetts Conflict of Interest Law or which creates an appearance of a violation of the Massachusetts Conflict of Interest Law.
- Contractor shall not discriminate against or exclude any person from m. participation herein on grounds of race, color, religious creed, national origin, sex, gender identity, sexual orientation (which shall not include persons whose sexual orientation involves minor children as the sex object), age, genetic information, ancestry, children, marital status, veteran status or membership in the armed services, the receiving of public assistance, and handicap. The previous sentence shall include, but not be limited to, the following: advertising, recruitment; hiring; rates of pay or other forms of compensation; terms; conditions or privileges of employment; employment upgrading; transfer; demotion; layoff; and termination. Contractor shall take affirmative actions to insure that applicants are employed, and that employees are treated during their employment, without regard to race, color, religious creed, national origin, sex, gender identity, sexual orientation (which shall not include persons whose sexual orientation involves minor children as the sex object), age, genetic information, ancestry, children, marital status, veteran status or membership in the armed services, the receiving of public assistance, and handicap.
- n. To the extent that any of the foregoing sections required by Massachusetts law 9 of 22

are inconsistent with other, non-statutory sections in this Agreement, any statutorily-mandated provisions contained herein shall control.

- o. Contractor shall not assign or subcontract in whole or in part this Agreement or in any way transfer any interest in this Agreement, other than the Subcontractors listed above, without the prior express written approval of the Client.
- p. This Agreement may be amended only by written consent of both parties.
- q. Contractor shall not assign any money due or to become due to Contractor unless the Client shall have received prior written notice of such assignment. No such assignment shall relieve Contractor of its obligations under this Agreement.
- r. If any provision, or portion thereof, of this Agreement shall be adjudged to be invalid or unenforceable by final judgment or order of a court of competent jurisdiction, the remaining provisions of the Agreement shall continue in effect to the extent permitted by law.
- s. The provisions of this Agreement shall be binding upon and inure to the benefit of the heirs, assigns and successors in interest of the parties.
- t. This Agreement shall be governed by and construed in accordance with the laws of the Commonwealth of Massachusetts, regardless of choice of law issues or principles.
- u. This Agreement is executed in triplicate as a sealed instrument.

(The remainder of this page is left intentionally blank.)

The Town of Natick, Massachusetts	Hobart Energy Services, Inc.
By: The Natick Board of Selectmen	By:
Amy K. Mistrot, Chair	Signature
•	C C
Susan G. Salamoff, Vice Chair	Printed Name
Michael J. Hickey, Jr., Clerk	Printed Title
Jonathan Freedman	
Richard P. Jennett, Jr.	
Dated:	Dated:

APPROVED AS TO AVAILABILITY OF APPROPRIATION:

In accordance with the requirements of M.G.L. Chapter 44, Section 31C, this is to certify that an appropriation in the amount of this Agreement is available therefor, and that the Natick Board of Selectmen is authorized to execute this Agreement and to approve all requisitions and execute change orders.

Arti P. Mehta Comptroller, Town of Natick

Dated:		

APPROVED AS TO FORM ONLY, AND NOT AS TO SUBSTANCE:

Karis	North,	Esq.
	,	-~ · · · ·

#### CERTIFICATE OF VOTE

I,, hereby cert (Clerk/Secretary)		rtify		
that I am the duly q	qualified and acting _		(Title)	of (Corporation
and I further certify 20 vote was unanimou	y that at a meeting of ), at which meet usly passed:	The Directors of said ting all Directors we	d Corporation dul re present and vo	ly called and held on ting, the following
	orize and empower ei	ther		,
	(Title)			
	(Title), e acting singly, to exe		nd bonds on behal	f of the Corporation.
	at the above vote is s hanged or modified in		he day of _	, 20
	Signature			
	Printed Name			

Printed Title

The certification contained hereabove shall be executed by Contractor or copy of current "certification of authority to sign for the Corporation" shall be attached.)

#### Exhibit A: Project Cost and Payment Terms

<b>Company Name:</b>	Town of Natick
<b>Billing Address:</b>	13 East Central Street, Natick Town Hall, Natick, MA 01760

#### Purchase Order/Contract #:

Project Cost:	
Labor, Material, Disposal Costs	\$65,478.00
Sales Tax on Material	N/A
Total Project Cost	\$65,478.00
Less: *ESTIMATED Project Incentives	
Utility App #	
Eversource	\$5,400.00
Total Incentives	\$5,400.00
Net Project Cost to Client	\$60,078.00

#### Note:

#### **Project Payment Terms:**

Amount to be paid by the Client to Contractor	\$60,078.00
(Payable 30 days after invoice date))	

Amount to be paid by Utilities to Contractor \$5,400.00 (Contractor will collect this amount directly from the Utilities)

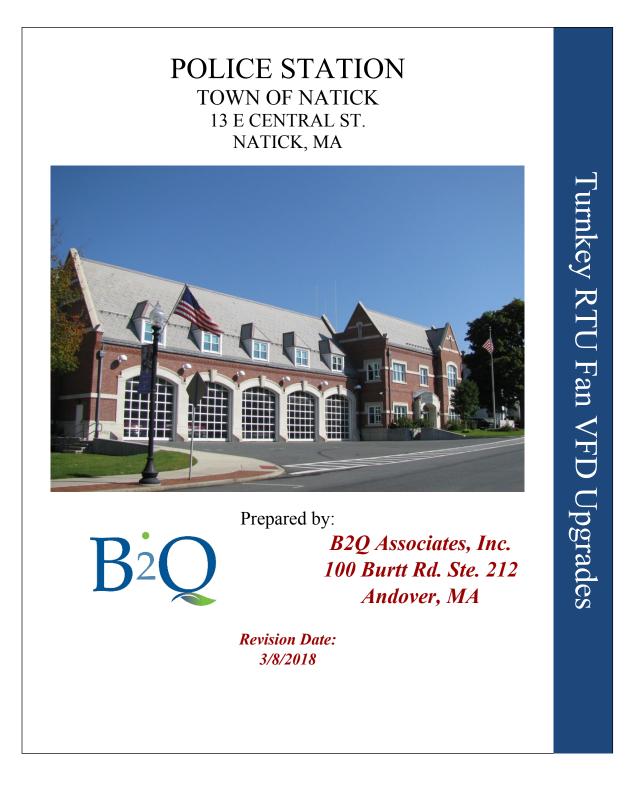
#### Total Project Cost \$65,478.00

#### **Schedule of Values:**

Mobilization Fee	\$15,000.00	Billed at Project Commencement for
		Purchase of Materials
Installation of Equipment	\$30,000.00	
Programming, Commissioning, and Closeout	\$9,070.20	Substantial Completion
Retainage	\$6,007.80	10%
Total Contract Amount	\$60,078.00	

The final invoice date will be determined by the "Certificate of Completion" as described in the Terms & Conditions.

Exhibit B: Project Proposal See next page.





B2Q Associates, Inc. 100 Burtt Rd. Suite 212 Andover, MA 01810 (978) 208 – 0609 www.b2qassociates.com

March 8, 2018

Ms. Jillian Wilson-Martin Sustainability Coordinator Town of Natick 75 West St. Natick, MA 01760

#### **RE:** Proposal for Turnkey RTU Fan VFD Upgrades in the Police Station

Dear Jillian,

B2Q is pleased to provide you with this proposal to provide turnkey project services for potential RTU fan VFD upgrade projects at the Police Station, located at 13 E Central St. in Natick, MA. B2Q has surveyed the facility with the intent of developing projects for which the Town can submit requests for Green Communities Act grant funding. The Town has shown a commitment to energy savings in a number of projects over the past several years. These projects will further contribute to the cost saving and carbon reducing goals for this facility.

### **ECONOMICS SUMMARY**

The estimated economics for these projects are given in the tables below. Eversource's published utility incentive programs offer between \$1,000 and \$1,400 per VFD in this size range and the Green Communities Act grant may cover up to the remainder of the project cost after utility incentive.

1 Police Station RTU Fan VFD Retrofits							
		%		Cost			
Utility	Savings Units	Savings		Saving	s		
Electricity	52,217 kWh	7.5%	\$	7,310	/yr		
Natural Gas	1,609 therms	8.1%	\$	1,690	/yr		
Total Energy	339 MMBtu	7.8%	\$	9,000	/yr		
Implementation First Cost \$ 69,978							
Electric Utility Incentive \$ 5,400							
Net Cost \$ 64,578							
Simple Payback 7.2 yr					yr		

### **ENVIRONMENTAL IMPACT**

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The proposed projects would result in net emissions reductions for the Town of Natick.

1 Police Station RTU Fan VFD Retrofits									
	Equivalent Emissions Reductions								
Utility	Energy Savings	CO <sub>2</sub>	NO <sub>X</sub>	SO <sub>X</sub>	Gasoline	Trees	Homes		
-		lb <sub>e</sub>	lb <sub>e</sub>	lb <sub>e</sub>	gal	-	-		
Electricity	52,217 kWh	37,704	157	448	1,920	439	1.6		
Natural Gas	1,609 therms	18,808	271	20,180	958	219	0.8		
Total	339 MMBtu	56,512	428	20,628	2,877	658	2.3		

These results are summarized in the tables below.

### **PROJECT DESCRIPTION**

The scope of the projects is the installation, programming, testing of (9) new variable frequency drives (VFDs) for (5) rooftop unit (RTU) fans in the Police Station. All work can be completed on the roof, meaning little impact on Police staff. Currently, the RTU fans run at full speed whenever there is a need for heating or cooling, independent of how much heating or cooling is needed. The results of this style of operation can be poor equipment performance, uncomfortable spaces for occupants, and wasted energy. The new VFDs would change the fans' speeds automatically based on feedback from the building about how much cooling is needed. This saves energy without impacting the system's ability to keep the building comfortable for occupants.

The air distribution systems already in place in the Police Station are well-suited for the addition of VFDs. The spaces are already served by VAV boxes. Since the RTU fans currently run at constant speed, the volume of air to the VAV boxes is regulated by a bypass damper that redirects unneeded air from the outlet of the fan back to the inlet of the fan before it reaches the boxes. This configuration is one of the earliest technologies for providing variable volume to spaces, but there are challenges associated with it. The bypass damper is often difficult to control precisely and this has been observed in that BAS screenshots show numerous instances of poorly controlled duct static pressure (see screenshot in the Appendices). The other downside of the bypass damper is that there is minimal energy savings when the building requires very little heating or cooling compared to when it requires full heating or cooling. VFDs can address both issues, as VFDs can respond to the building demand more quickly and precisely than the bypass damper, while saving more energy in the process. Also, because the building already has VAV boxes and static pressure sensors to work with the bypass dampers, they don't need to be added as part of this project, saving on the implementation cost compared to a typical VFD project.

B2Q intends to work with Automated Logic, who already provides service for the controls system in the facility. Automated Logic's electrical subcontractor would install the new VFDs in weatherproof enclosures on the existing RTUs on the roof, wire the VFDs to the existing fans and controllers, and then modify the programming of the controllers to implement the new sequence of operation. They will also be responsible for upgrading the control graphics, commissioning the system with B2Q's help, and training the building's custodian(s) on how the new equipment should run. As mentioned above, the majority of the work can be done on the roof and during normal business hours,

meaning minimal interference with or demand on Police and Facilities staff.

The proposed structure of the project is that B2Q would deliver this project to the Town of Natick as a turnkey vendor. This means that the Town would only need to have one contract and write one purchase order for this project. B2Q would hire the controls contractor as a subcontractor and would pay them out of the single purchase order provided by the Town. In addition to hiring and managing the subcontractor, B2Q would provide the following services. See the Appendices for more information on our scope of work, including assumptions and exclusions.

- Energy savings analysis and calculations to a level of detail and accuracy that is typically required by Eversource and the Green Communities Act program administrators to secure funding.
- Eversource utility incentive applications.
- Green Communities Act grant applications.
- Contractor observation during construction.
- Commissioning of the newly-installed equipment after construction to verify proper operation
- Project management throughout construction, including construction schedule, building access, and coordination with the Town

### **SCHEDULE**

- B2Q and its subcontractors shall begin work within (4) weeks of receiving a purchase order from the Town of Natick.
- Installation of the VFDs shall be complete within (4) weeks of project commencement.
- Programming and commissioning of the project shall be complete within (3) weeks of completing the VFD installations.

We thank you for the opportunity to provide you with this proposal and look forward to working with you on this project if selected.

Thank you,

# Paul Banks

Paul Banks, PE Principal B2Q Associates, Inc.

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# **APPENDICES**

### **EXAMPLE BAS SCREENSHOT**

The example screenshot below shows the configuration of the fan, bypass damper, and static pressure sensor, as described above. Additionally, one can see that the static pressure is well below setpoint, which could in part explain some of the complaints about spaces not having enough airflow.



### ASSUMPTIONS AND EXCLUSIONS

- 1. The above schedule and price are contingent upon B2Q and its subcontractors having consistent access to the facility. B2Q is not responsible for delays caused by restricted access to specific areas of the building and/or the building as a whole.
- 2. This proposal does not include any work associated with issues caused by hidden conditions or correction of existing code violations.

### **ENERGY CONSUMPTION ESTIMATES**

B2Q's energy cost savings estimates above are based on an average billing rate of \$0.14/kWh and \$1.05/therm, as specific information from the Town was not available at the time of this proposal. If necessary, B2Q can update the above analysis based on updated information provided by the Town.

B2Q has no control of the actual building and equipment operation or over other

variables which may affect energy consumption and/or associated costs or savings. Accordingly, B2Q does not expressly or implicitly warrant or represent that energy consumption savings and cost savings estimates of the building or equipment operation will be the actual operation energy and cost savings.

### **UTILITY INCENTIVES AND GREEN COMMUNITIES ACT GRANTS**

B2Q Associates has no control over the decisions of utility companies or state agencies to provide incentives or grants. Since incentives and grants are entirely at the discretion of the utility or state agency, B2Q does not expressly or implicitly warrant or represent that incentives will be awarded. However, B2Q will work within the framework of the existing programs to obtain available incentives for the Town of Natick in accordance with the rules and methods prescribed by Eversource and Commonwealth of Massachusetts. B2Q will prepare application forms on the Town's behalf and work with utility representatives and state agencies to help determine the funding levels to be provided. Eversource and the Commonwealth of Massachusetts conduct pre- and post-installation site inspections to verify existing equipment and to ensure that the installed equipment meets program specifications.

### CONTRACT TERMS

This proposal is valid for thirty days. All work is estimated to be done during normal daytime hours.

B2Q's aggregate, one-time liability to all claimants for any and all direct, incidental and consequential damages, both property and economic, arising in any way under this proposal, shall be limited to our fee. If this proposal is accepted by the Town, B2Q and the Town of Natick would use an updated version of the contract that was used for the Library Occupancy Sensors project.

### **GENERAL FIRM DESCRIPTION**

B2Q provides energy engineering and turn-key energy efficiency project delivery, energy audits and screening studies, commissioning and retro-commissioning, technical training, project management, design, engineering, design reviews, troubleshooting, testing, measurement and verification, metering, building simulation, building automation, cogeneration, and utility demand side management program consulting.

### KEY PERSONNEL

Paul Banks will be the principal in charge for this project. Mr. Banks will be responsible for the overall project staffing and quality reviews. Mr. Banks will review project deliverables prior to submission for quality assurance.

Joe Bliss will be the Project Manager. Mr. Bliss will be responsible for project specifications, installation management, and quality control.

This Agreement is made this \_\_\_\_\_day of \_\_\_\_\_, 2018, by and between the Town of Natick with an address of Natick Town Hall, 13 East Central Street, Natick, MA 01760, by the Natick Board of Selectmen (hereinafter the "Town," or the "Client"), and Hobart Energy Services, Inc., a corporation with a principal place of business at 30 Crescent Dr. Salem, MA (hereinafter the "Contractor").

The words "he," "him" and "his" in this Agreement, as far as they refer to the Contractor, shall so refer whether the Contractor is an individual, partnership or corporation. All prior contracts, if any exist between the Town and the Contractor, are hereby terminated and shall be of no force and effect.

#### 1. Scope of Services and Scheduling

In consideration of the obligations herein contained, Contractor shall perform the work included in the scopes of work in the B2Q proposals dated March 8, 2018 (the "Project"), which is attached hereto and incorporated herein by reference. All materials shall be new and shall meet UL, Federal, State and Local code requirements. Any material change to the scope of work, including acceptance of the additional cost for the work, shall be agreed upon by both parties in writing before the work is performed. The work will be considered complete, with the exception of any minor open items, after the Client and Utility representative review and approval of the work (herein referred to as the "certificate of completion").

Contractor provides this proposal based on Prevailing wage requirements, if applicable, and all work performed during normal work week (6:00 A.M. to 3:30 P.M. local time), unless otherwise stated in the proposal (subject to M.G.L. c. 149, §34).

Contractor shall install the Project with regard for the appearance and condition of the Client's property. Waste material shall be removed daily.

The Client will cooperate and coordinate with Contractor on scheduling and maximize productivity on Energy Conservation projects. The Client will allow Contractor access to areas of the building to ensure rapid, efficient installation and completion of the Project.

Contractor shall employ the following Subcontractors to accomplish the scope of work.

- B2Q Associates, Inc. (engineering, commissioning, project management)
- Trane Company, Inc. (controls)
- Automated Logic Corporation (controls and electrical contracting)
- Enterprise Equipment Company, Inc. (mechanical contracting)
- New England Ductless (mechanical contracting)
- 2. Standard of Care

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The Contractor's services shall be performed as expeditiously as is consistent with professional skill and care and the orderly progress of the work. The Contractor shall exercise due care and diligence in the rendition of all services under this Agreement in accordance with the applicable professional standards in the eastern Massachusetts area.

The Contractor's services shall be performed as expeditiously as is consistent with such standards.

3. Term

The term of this Agreement shall be for one (1) year, commencing as of the execution date of this Agreement, and ending one (1) year later.

4. Order of Priority of Agreement Documents

In the event of any conflict among the Agreement Documents, the Documents shall be construed according to the following priorities:

Highest Priority:Amendments to Agreement (if any)Second Priority:Agreement

#### 5. Payment

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In consideration for performance of the work in accordance with the requirements of this Agreement, the Client shall pay Contractor the prices in the Schedule of Values set forth in Exhibit A, which is attached hereto and incorporated by reference.

This Agreement is a fixed price/fixed rate contract; and, therefore, miscellaneous expenditures associated with Contractor's work on the Project shall not be paid by the Client. In the event that an unforeseen miscellaneous expense is incurred, Contractor shall receive the Client's approval in writing prior to incurring the expense if it will subsequently seek payment of said expense from the Client.

Payment shall be made to Contractor for work completed in accordance with this Agreement. All requests for payment shall be submitted to the Client as an invoice and shall specify work completed and progress made toward completing deliverables.

Payment will be due thirty (30) days after receipt of Contractor's invoice by the Client for services rendered in accordance with this Agreement. The Client shall not make payments in advance.

If the Client objects to all or part of any invoice, the Client shall notify the Contractor in writing within two (2) weeks of the date of receipt of the invoice, and shall pay that portion of the invoice not in dispute within thirty (30) days after the date of receipt of the invoice.

Should it be necessary for Contractor to engage the services of a specialized contractor or companies other than those originally proposed in B2Q's proposal, Contractor shall take such measures only with the Client's prior written approval. Charges for such services shall be billed directly to the Client unless otherwise agreed upon by the parties.

Payment of the amounts due under this Agreement shall release the Town of Natick and its officers, employees, boards, commissions, committees, agents and representatives,

from any and all claims and liability in any way relating to this Agreement or anything done in pursuance thereof.

No payment by the Client to Contractor shall be deemed to be a waiver of any right of the Client under this Agreement or a ratification by the Client of any breach hereof by Contractor.

#### 6. Warranty

It is understood and agreed that Contractor will perform all services hereunder in a professional manner with appropriately skilled employees or subcontractors. Contractor warrantees the workmanship for one (1) year from the date of the certificate of completion and shall assign all applicable Manufacturers' warranties for products used on the Project to the Client. Contractor shall also assist in completing all applicable warrantee registration forms and explain the warrantee process for these Manufacturer warranties.

#### 7. Compliance with Laws

Contractor shall comply with all provisions of Federal, Massachusetts and Town of Natick law applicable to his work including, without limitation, statutes, by-laws, rules, regulations, orders and directives, as amended, and including, without limitation, the Williams-Steiger Occupational Safety and Health Act, as amended, and related regulations, as amended, in effect throughout the term of this Agreement and any extension or renewal thereof. Without limitation, Contractor shall comply with the provisions of Chapter 149, Section 26 to 27D of the Massachusetts General Laws, as amended, and the applicable minimum wage rates as determined by the Massachusetts Commissioner of Labor and Industries. This Agreement shall be considered to include in their entirety all terms respecting workers' compensation insurance and other terms required to be included in it by Chapter 152 of the Massachusetts General Laws, as amended, as though such terms were set forth in their entirety herein.

#### 8. Insurance

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Contractor shall insure and shall require each of its subcontractors to carry the following insurance to the extent stated:

- a. Workers' Compensation Insurance as required by the laws of the Commonwealth of Massachusetts and employer's liability insurance in the amount of \$1,000,000/\$1,000,000.
- b. Commercial General Liability Insurance, \$1,000,000 each occurrence and \$2,000,000 aggregate limit. Commercial General Liability insurance shall include personal injury liability, broad form property damage liability, products/completed operations liability and broad form contractual liability.
- c. Automobile Liability Insurance, covering all non-owned and hired vehicles -

Combined single limit of \$1,000,000.

- d. Professional Liability Insurance, covering errors and omissions, \$1,000,000 each claim and \$2,000,000 aggregate limit.
- e. Excess Liability Insurance, Umbrella Form \$1,000,000 each occurrence and \$2,000,000 aggregate, which shall be following form, providing coverage over commercial general liability insurance and employer's liability under workers' compensation insurance.
- f. The Town of Natick shall be named as additional insured on each such policy of Commercial General Liability Insurance and, if required, Automobile Liability Insurance.
- g. All certificates and policies shall contain the following provision:

"Notwithstanding any other provision herein, should any of the above policies be cancelled or materially amended before the expiration date thereof, the issuing company will mail thirty (30) days prior written notice thereof to the named certificate holder and to the Natick Town Administrator, Natick Town Hall, 13 East Central Street, Natick, MA 01760, before such cancellation or amendment shall take place."

- h. Certificates evidencing such insurance in five (5) copies shall be furnished to the Client at the execution of this Agreement. Such certificates shall not merely name the types of policy provided, but shall specifically refer to this Agreement and shall state that such insurance is as required by this Agreement. Contractor shall make no claims against the Town of Natick or its officers for any injury to any of its officers or employees or for damage to its equipment arising out of work contemplated by the Agreement.
- i. Contractor shall also be required to provide to the Town of Natick with its proof of insurance coverage endorsements or riders to the policies of commercial general liability insurance and, if required, automobile liability insurance, which indicate that the Town of Natick are named as additional insureds on each such policy.
- j. No insurance shall be obtained from an insurer which:
  - 1. is not licensed to sell insurance in the Commonwealth of Massachusetts; or

2. is not authorized to provide insurance as an excess or surplus lines insurer, and does not have a current Best's rating of A or better.

- k. Failure to provide and continue in force such insurance as aforesaid shall be deemed a material breach of this Agreement and shall operate as an immediate termination thereof.
- 9. Indemnification

Contractor shall compensate the Client for all damage to the Client's property of any nature arising out of Contractor's work. To the fullest extent permitted by law, Contractor shall indemnify, defend, and hold harmless the Town of Natick and all of its officers, employees, boards, commissions, committees, agents and representatives from and against all claims, causes of action, suits, costs, damages, and liability of any kind which, to the extent caused by the willful or negligent acts, errors or omissions by Contractor and those of anyone for whom Contractor is legally liable, arise out of the breach by Contractor of its obligations under this Agreement, or the act or omission of Contractor, its subcontractors, or their officers, employees, agents and representatives or anyone directly or indirectly employed by them, or anyone for whose acts or omissions they may be liable, regarding the work to be performed by Contractor under the Agreement, or which arise out of the violation of any federal, Massachusetts or Town of Natick statute, by-law, rule, regulation, order or directive, or which relate to personal injury or property damage suffered by Contractor or any of its officers, employees, or subcontractors regarding the subject matter of this Agreement. Said costs shall include, without limitation, legal costs, collections fees, and counsel fees incurred in defending any claim or suit that may be brought against the Client and any judgment that may be obtained in any such claim or suit.

#### 10. No Personal Liability

Neither the Town of Natick, nor its officers, employees, boards, committees, commissions, agents and representatives shall be under any personal obligation or incur any personal liability by reason of this Agreement, the execution thereof or anything relating thereto which arises out of the breach or violation of any provision of this Agreement, or the violation of any Federal, Massachusetts or Town of Natick statute, by-law, rule, regulation, order or directive, or which relates to personal injury or property damage suffered by Contractor, its employees, or subcontractors, regarding the subject matter of this Agreement.

#### 11. Familiarity with Area of Work

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By signing this Agreement, Contractor acknowledges that it has examined the subject matter of this Agreement, including, without limitation, the provision of energy consulting services, and that it is familiar with all sites which are the subject of this Agreement in the Town of Natick and with all conditions of this Agreement. Contractor has entered into this Agreement in reliance on its own examinations and estimates as to the amount and character of its work, and conditions which may be encountered in the performance thereof, and shall assume all risks and bear all losses pertaining thereto.

The nature of Contractor's work includes the installation of energy efficiency equipment and solutions. Contractor does not take responsibility for the following existing conditions at the Project site: existing code violations, structural issues, deteriorating wiring and hazardous material, such as asbestos, lead paint, and oil. To the extent that Contractor and/or its officers, employees, agents, subcontractors or consultants do not cause the presence of hazardous material at the Project site, Contractor and its officers,

employees, agents, subcontractors and consultants shall have no responsibility for the discovery, presence, handling, removal or disposal of, or exposure of persons to, hazardous material in any form at the Project site. If Contractor discovers hazardous material at the Project site, it shall immediately notify the Client in writing and shall refrain from disturbing or taking any action with respect to the hazardous material in the absence of the Client's written direction. In the event Contractor does disturb such hazardous material or does take such action without written direction, the limitation of liability in this paragraph shall not apply.

12. Performance Bond

DELETED - NOT APPLICABLE.

13. Labor and Materials Payment Bond\_

DELETED – NOT APPLICABLE.

14. Independent Contractor Status

Contractor shall provide services under this Agreement as an independent contractor with the Town of Natick and not as an employee of the Town. No employee, agent or representative of Contractor shall be entitled to receive any benefits of employment with the Town of Natick, including without limitation salary, overtime, vacation pay, holiday pay, sick leave, health insurance, life insurance, pension or deferred compensation.

15. Use of Alcohol and Controlled Substances Prohibited

Contractor hereby acknowledges that the use of alcoholic beverages, narcotics, and mood altering substances, except for current valid, legal prescriptions, by any officer, employee, agent, or representative of Contractor is prohibited on Town property which is the subject matter of this Agreement and during all hours of work under this Agreement. If any officer, employee, agent, or representative of Contractor violates the foregoing provision, the Client shall have the right to order that such officer, employee, agent, or representative of Contractor shall not be permitted to return to work on this Agreement. Under such circumstances, Contractor shall promptly remove the subject officer, employee, agent, or representative from the job site and shall not permit the subject officer, employee, agent, or representative to perform further work in conjunction with this Agreement.

16. No Smoking

Pursuant to Massachusetts General Laws (M.G.L.) c. 270, §22, the Commonwealth of Massachusetts Smokefree Workplace Law, Contractor, its officers, employees, agents, subcontractors, and representatives shall refrain from smoking and from using tobacco products in any public building in the Town of Natick.

17. Criminal Background Screening

For each employee of Contractor who is performing services under this Agreement, Contractor shall, subject to its confidentiality and privacy obligations owing to its employees and third parties, provide a written confirmation to the Client that such employee passed Contractor's pre-employment criminal background screen. In the event that any employee refuses to permit Contractor to provide such information to the Client, Contractor shall not assign such employee to perform services for the Client, and such employee shall not be authorized to perform services for the Client. The Client shall be permitted to keep such information in its files.

#### 18. Delays/Force Majeure

Except as specifically set forth in this Agreement, neither party shall hold the other responsible or liable for damages or delays in performance caused by acts of God, interruptions in the availability of labor, or other events beyond the control of the other party, or that could not have been reasonably foreseen or prevented. For this purpose, such acts or events shall include unusually severe weather affecting performance of services, floods, epidemics, wars, riots, strikes, lockouts, or other industrial disturbances, protest demonstrations, and project site conditions which could not have been reasonably anticipated. Should such acts or events occur, both parties shall use their best efforts to overcome the difficulties arising and to resume as soon as reasonably possible the normal pursuit of the services for the Project.

#### 19. Termination

- a. If Contractor shall breach any provision of this Agreement, which breach is not cured within twenty-one (21) days of written notice thereof from the Client to Contractor, the Client shall have the right to terminate this Agreement upon written notice to Contractor.
- b. If any assignment shall be made by Contractor or by any guarantor of Contractor for the benefit of creditors, or if a petition is filed by Contractor or by any guarantor of Contractor for adjudication as a bankrupt, or for reorganization or an arrangement under any provision of the Bankruptcy Act as then in force and effect, or if an involuntary petition under any of the provisions of the Bankruptcy Act is filed against Contractor and such involuntary petition is not discharged within ninety (90) days thereafter, in any event the Client may terminate this Agreement upon written notice to Contractor.
- c. The award of this Agreement and the continued operation of this Agreement are contingent upon appropriation by Natick Town Meeting of sufficient money to fund the Agreement. Should Natick Town Meeting fail to appropriate necessary funds therefor, the Client shall no longer be under any obligation to tender performance, including payment, under the terms of this Agreement. In that event, the Client may terminate this Agreement upon written notice to Contractor.
- d. The Client may terminate this Agreement upon written notice to Contractor if a source of money to fund the Agreement is lost during the Agreement term. In the alternative, the parties may agree in writing to amend the

Agreement to provide for an Agreement price which represents a reduced appropriation for the Agreement term.

e. The Client may also terminate this Agreement for convenience upon thirty (30) days' written notice to Contractor.

In the event of termination Contractor shall be entitled to be paid for services rendered in accordance with this Agreement prior to termination.

In the event that this Agreement is terminated pursuant to Section a. or b. above, the Client may make any reasonable purchase or contract to purchase services in substitution for services due from Contractor and may deduct the cost of any substitute contract, or damages sustained by the Client due to non-performance or non-conformance of services together with incidental and consequential damages from the Agreement price, and shall withhold such damages from sums due or sums which become due.

#### 20. Notices

Except as otherwise provided in this Agreement all notices required or permitted to be given hereunder shall be in writing and shall be delivered by certified mail or registered mail, return receipt requested, to the parties at the following address or such other address or addresses as to which a party shall have notified the other party in accordance with this Section.

If to the Town of Natick:	Melissa A. Malone Town of Natick 13 East Central Street Natick, MA 01760
With copies to:	Karis North, Esq. Murphy, Hesse, Toomey & Lehane, LLP 300 Crown Colony Drive, Suite 410 Quincy, MA 02169
If to Contractor:	Ed Skeffington Hobart Energy Services, Inc. 30 Crescent Dr. Salem, MA 01970

#### 21. Miscellaneous Provisions

- a. Any action at law or suit in equity instituted by Contractor as a result of the performance, non-performance or alleged breach of this Agreement shall be filed in the Superior Court of the Commonwealth of Massachusetts for Middlesex County, MA, and in no other court or jurisdiction.
- b. No action or failure to act by either party shall constitute a waiver of a right or

duty afforded to that party under the Agreement, nor shall such action or failure to act constitute approval of or acquiescence in a breach thereunder, except as may be specifically agreed in writing. No forbearance or indulgence in any form or manner by either party shall be construed as a waiver or in any way limit the legal or equitable remedies available to that party. No waiver by either party of any default or breach by the other party shall constitute a waiver of any subsequent default or breach.

- c. If Contractor discovers or is informed of any discrepancy or inconsistency in the Agreement Documents in relation to any law, statute, ordinance, by-law, decree, code, rule, regulation, or order, Contractor shall promptly, before commencing services under this Agreement, report the same to the Client in writing.
- d. Contractor acknowledges that it has not been influenced to enter into this Agreement, nor has Contractor relied upon any warranties or representations not set forth in this instrument.
- e. Contractor shall maintain the confidentiality of information designated by the Client as confidential, unless withholding such information would violate the law or create a risk of significant harm to the public, or unless Contractor has been required to release such information by final judgment or order of a court of competent jurisdiction, or unless the Client has expressly waived such confidentiality in advance in writing.
- g. Contractor shall not represent or purport to represent that it speaks for the Client vis-à-vis the media or the public at-large without the Client's express, written consent in advance.
- h. Prior to commencing services under this Agreement, Contractor shall furnish the Client, in writing, the names, addresses and telephone numbers of not fewer than two (2) principal employees of his business who are to be contacted in the event of an after-hours emergency.
- i. By entering into this Agreement, Contractor certifies under penalties of perjury that its entry was made and submitted in good faith and without collusion or fraud with any person. As used in this certification, the word "person" shall mean any natural person, business, partnership, corporation, union, committee, club, or other organization, entity, or group of individuals.
- j. By entering into this Agreement, Contractor certifies under the penalties of perjury, pursuant to M.G.L. c.62C, Section 49A(b), that it has complied with all laws of the Commonwealth relating to taxes, to reporting of employees and contractors, and to withholding and remitting child support.
- k. Prevailing wage rates, as contained in the Bid documents, shall be paid, pursuant to M.G.L. c.149, §§26-27G, if they are applicable.
- 1. Contractor understands that the Massachusetts Conflict of Interest Law, Chapter

268A of the Massachusetts General Laws, applies to Contractor with respect to the services required to be provided under this Agreement. Contractor and its officers, employees, agents, subcontractors and affiliated agencies shall not participate in any activity which constitutes a violation of the Massachusetts Conflict of Interest Law or which creates an appearance of a violation of the Massachusetts Conflict of Interest Law.

- Contractor shall not discriminate against or exclude any person from m. participation herein on grounds of race, color, religious creed, national origin, sex, gender identity, sexual orientation (which shall not include persons whose sexual orientation involves minor children as the sex object), age, genetic information, ancestry, children, marital status, veteran status or membership in the armed services, the receiving of public assistance, and handicap. The previous sentence shall include, but not be limited to, the following: advertising, recruitment; hiring; rates of pay or other forms of compensation; terms; conditions or privileges of employment; employment upgrading; transfer; demotion; layoff; and termination. Contractor shall take affirmative actions to insure that applicants are employed, and that employees are treated during their employment, without regard to race, color, religious creed, national origin, sex, gender identity, sexual orientation (which shall not include persons whose sexual orientation involves minor children as the sex object), age, genetic information, ancestry, children, marital status, veteran status or membership in the armed services, the receiving of public assistance, and handicap.
- n. To the extent that any of the foregoing sections required by Massachusetts law are inconsistent with other, non-statutory sections in this Agreement, any statutorily-mandated provisions contained herein shall control.
- o. Contractor shall not assign or subcontract in whole or in part this Agreement or in any way transfer any interest in this Agreement, other than the Subcontractors listed above, without the prior express written approval of the Client.
- p. This Agreement may be amended only by written consent of both parties.
- q. Contractor shall not assign any money due or to become due to Contractor unless the Client shall have received prior written notice of such assignment. No such assignment shall relieve Contractor of its obligations under this Agreement.
- r. If any provision, or portion thereof, of this Agreement shall be adjudged to be invalid or unenforceable by final judgment or order of a court of competent jurisdiction, the remaining provisions of the Agreement shall continue in effect to the extent permitted by law.
- s. The provisions of this Agreement shall be binding upon and inure to the benefit of the heirs, assigns and successors in interest of the parties.
- t. This Agreement shall be governed by and construed in accordance with the laws of the Commonwealth of Massachusetts, regardless of choice of law issues or

principles.

u. This Agreement is executed in triplicate as a sealed instrument.

(The remainder of this page is left intentionally blank.)

 The Town of Natick, Massachusetts
 Hobart Energy Services, Inc.

 By: The Natick Board of Selectmen
 By:

 Amy K. Mistrot, Chair
 Signature

 Susan G. Salamoff, Vice Chair
 Printed Name

 Michael J. Hickey, Jr., Clerk
 Printed Title

 Jonathan Freedman
 Dated:

 Dated:
 Dated:

#### APPROVED AS TO AVAILABILITY OF APPROPRIATION:

In accordance with the requirements of M.G.L. Chapter 44, Section 31C, this is to certify that an appropriation in the amount of this Agreement is available therefor, and that the Natick Board of Selectmen is authorized to execute this Agreement and to approve all requisitions and execute change orders.

Arti P. Mehta Comptroller, Town of Natick

APPROVED AS TO FORM ONLY, AND NOT AS TO SUBSTANCE:

Karis North, Esq.

Dated:

Dated:

#### CERTIFICATE OF VOTE

, (Clerk/Secretary)		, hereby ce	, hereby certify		
(Clerl	k/Secretary)				
that I am the duly	qualified and acting	5		of (Corporation	
Name)			(Title)	(Corporation	
and I further cert	20, at which me	of the Directors of s eeting all Directors w	aid Corporation du were present and vo	ly called and held on ting, the following	
	horize and empower	either		,	
(Name)	(Title)				
(Name)	(Title)	; or			
(Name)	(Title),				
any o	ne acting singly, to e	xecute all contracts	and bonds on behal	f of the Corporation.	
	that the above vote is changed or modified		is the day of _	, 20	
	Signature				
	Printed Name	2			

Printed Title

The certification contained hereabove shall be executed by Contractor or copy of current "certification of authority to sign for the Corporation" shall be attached.)

#### **Exhibit A: Project Cost and Payment Terms**

<b>Company Name:</b>	Town of Natick
<b>Billing Address:</b>	13 East Central Street, Natick Town Hall, Natick, MA 01760

#### Purchase Order/Contract #:

Project Cost:	
Labor, Material, Disposal Costs	\$53,999.00
Sales Tax on Material	N/A
Total Project Cost	\$53,999.00
Less: *ESTIMATED Project Incentives	
Utility App #	
Eversource	\$4,400.00
Total Incentives	\$4,400.00
Net Project Cost to Client	\$49,599.00

#### Note:

#### **Project Payment Terms:**

Amount to be paid by the Client to Contractor	\$49,599.00
(Payable 30 days after invoice date))	ŕ

Amount to be paid by Utilities to Contractor\$4,400.00(Contractor will collect this amount directly from the Utilities)

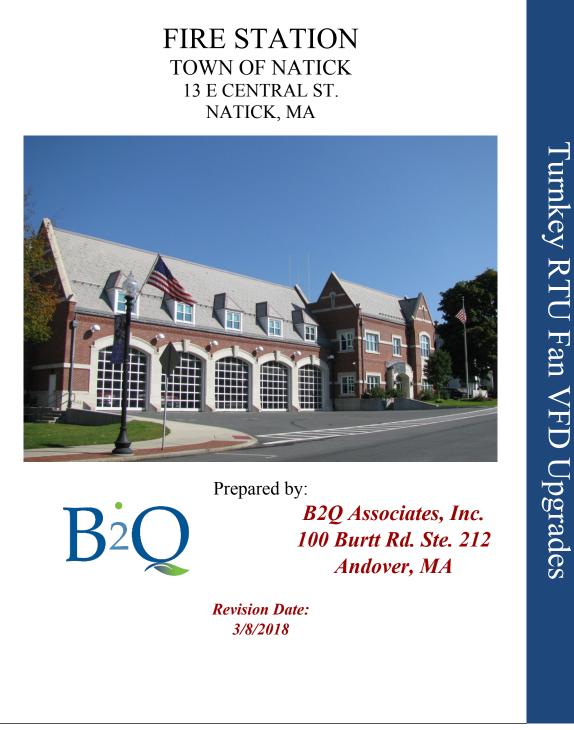
#### Total Project Cost \$53,999.00

#### **Schedule of Values:**

Mobilization Fee	\$15,000.00	Billed at Project Commencement for Purchase of Materials
Installation of Equipment	\$25,000.00	
Programming, Commissioning, and Closeout	\$4,639.10	Substantial Completion
Retainage	\$4,959.90	10%
Total Contract Amount	\$49,599.00	

The final invoice date will be determined by the "Certificate of Completion" as described in the Terms & Conditions.

Exhibit B: Project Proposal See next page.





B2Q Associates, Inc. 100 Burtt Rd. Suite 212 Andover, MA 01810 (978) 208 – 0609 www.b2qassociates.com

March 8, 2018

Ms. Jillian Wilson-Martin Sustainability Coordinator Town of Natick 75 West St. Natick, MA 01760

### **RE:** Proposal for Turnkey RTU Fan VFD Upgrades in the Fire Station

Dear Jillian,

B2Q is pleased to provide you with this proposal to provide turnkey project services for potential RTU fan VFD upgrade projects at the Fire Station, located at 13 E Central St. in Natick, MA. B2Q has surveyed the facility with the intent of developing projects for which the Town can submit requests for Green Communities Act grant funding. The Town has shown a commitment to energy savings in a number of projects over the past several years. These projects will further contribute to the cost saving and carbon reducing goals for this facility.

### **ECONOMICS SUMMARY**

The estimated economics for these projects are given in the tables below. Eversource's published utility incentive programs offer between \$1,000 and \$1,400 per VFD in this size range and the Green Communities Act grant may cover up to the remainder of the project cost after utility incentive.

2 Fire Station RTU Fan VFD Retrofits						
		%	Cost			
Utility	Savings Units	Savings		Savings		
Electricity	35,361 kWh	5.1%	\$	4,951	/yr	
Natural Gas	1,083 therms	5.5%	\$	1,137	/yr	
Total Energy	229 MMBtu	5.2%	\$	6,088	/yr	
Implementation First Cost			\$	58,499		
Electric Utility Incentive			\$	4,400		
Net Cost			\$	54,099		
Simple Payback				8.9	yr	

## ENVIRONMENTAL IMPACT

2 Fire Station RTU Fan VFD Retrofits								
Equivalent Emissions Reductions								
Utility	Energy Savings	CO <sub>2</sub>	NO <sub>X</sub>	SO <sub>X</sub>	Gasoline	Trees	Homes	
-		lb <sub>e</sub>	$Ib_e$	lb <sub>e</sub>	gal	-	-	
Electricity	35,361 kWh	25,533	106	303	1,300	297	1.1	
Natural Gas	1,083 therms	12,658	183	13,581	644	147	0.5	
Total	229 MMBtu	38.190	289	13,884	1.945	445	1.6	

The proposed projects would result in net emissions reductions for the Town of Natick. These results are summarized in the tables below.

### PROJECT DESCRIPTION

The scope of the projects is the installation, programming, testing of (9) new variable frequency drives (VFDs) for (4) rooftop unit (RTU) fans in the Fire Station. All work can be completed on the roof, meaning little impact on Fire staff. Currently, the RTU fans run at full speed whenever there is a need for heating or cooling, independent of how much heating or cooling is needed. The results of this style of operation can be poor equipment performance, uncomfortable spaces for occupants, and wasted energy. The new VFDs would change the fans' speeds automatically based on feedback from the building about how much cooling is needed. This saves energy without impacting the system's ability to keep the building comfortable for occupants.

The air distribution systems already in place in the Fire Station are well-suited for the addition of VFDs. The spaces are already served by VAV boxes. Since the RTU fans currently run at constant speed, the volume of air to the VAV boxes is regulated by a bypass damper that redirects unneeded air from the outlet of the fan back to the inlet of the fan before it reaches the boxes. This configuration is one of the earliest technologies for providing variable volume to spaces, but there are challenges associated with it. The bypass damper is often difficult to control precisely and this has been observed in that BAS screenshots show numerous instances of poorly controlled duct static pressure (see screenshot in the Appendices). The other downside of the bypass damper is that there is minimal energy savings when the building requires very little heating or cooling compared to when it requires full heating or cooling. VFDs can address both issues, as VFDs can respond to the building demand more quickly and precisely than the bypass damper, while saving more energy in the process. Also, because the building already has VAV boxes and static pressure sensors to work with the bypass dampers, they don't need to be added as part of this project, saving on the implementation cost compared to a typical VFD project.

B2Q intends to work with Automated Logic, who already provides service for the controls system in the facility. Automated Logic's electrical subcontractor would install the new VFDs in weatherproof enclosures on the existing RTUs on the roof, wire the VFDs to the existing fans and controllers, and then modify the programming of the controllers to implement the new sequence of operation. They will also be responsible for

upgrading the control graphics, commissioning the system with B2Q's help, and training the building's custodian(s) on how the new equipment should run. As mentioned above, the majority of the work can be done on the roof and during normal business hours, meaning minimal interference with or demand on Fire and Facilities staff.

The proposed structure of the project is that B2Q would deliver this project to the Town of Natick as a turnkey vendor. This means that the Town would only need to have one contract and write one purchase order for this project. B2Q would hire the controls contractor as a subcontractor and would pay them out of the single purchase order provided by the Town. In addition to hiring and managing the subcontractor, B2Q would provide the following services. See the Appendices for more information on our scope of work, including assumptions and exclusions.

- Energy savings analysis and calculations to a level of detail and accuracy that is typically required by Eversource and the Green Communities Act program administrators to secure funding.
- Eversource utility incentive applications.
- Green Communities Act grant applications.
- Contractor observation during construction.
- Commissioning of the newly-installed equipment after construction to verify proper operation
- Project management throughout construction, including construction schedule, building access, and coordination with the Town

# **SCHEDULE**

- B2Q and its subcontractors shall begin work within (4) weeks of receiving a purchase order from the Town of Natick.
- Installation of the VFDs shall be complete within (4) weeks of project commencement.
- Programming and commissioning of the project shall be complete within (3) weeks of completing the VFD installations.

We thank you for the opportunity to provide you with this proposal and look forward to working with you on this project if selected.

Thank you,

# Paul Banks

Paul Banks, PE Principal B2Q Associates, Inc.

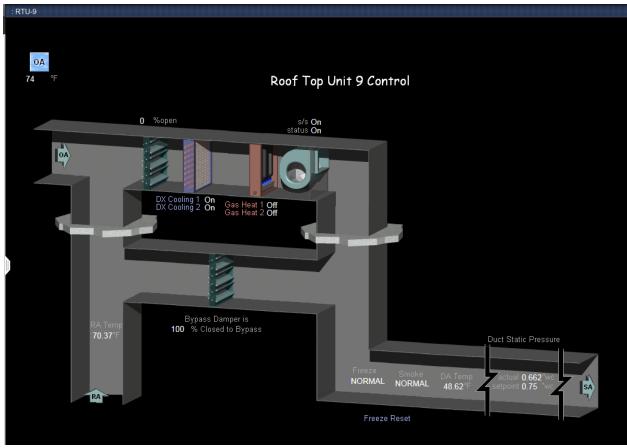
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# APPENDICES

# **EXAMPLE BAS SCREENSHOT**

The example screenshot below shows the configuration of the fan, bypass damper, and

static pressure sensor, as described above. Additionally, one can see that the static pressure is well below setpoint, which could in part explain some of the complaints about spaces not having enough airflow.



## ASSUMPTIONS AND EXCLUSIONS

- 1. The above schedule and price are contingent upon B2Q and its subcontractors having consistent access to the facility. B2Q is not responsible for delays caused by restricted access to specific areas of the building and/or the building as a whole.
- 2. This proposal does not include any work associated with issues caused by hidden conditions or correction of existing code violations.

# **ENERGY CONSUMPTION ESTIMATES**

B2Q's energy cost savings estimates above are based on an average billing rate of \$0.14/kWh and \$1.05/therm, as specific information from the Town was not available at the time of this proposal. If necessary, B2Q can update the above analysis based on updated information provided by the Town.

B2Q has no control of the actual building and equipment operation or over other variables which may affect energy consumption and/or associated costs or savings.

Accordingly, B2Q does not expressly or implicitly warrant or represent that energy consumption savings and cost savings estimates of the building or equipment operation will be the actual operation energy and cost savings.

# **UTILITY INCENTIVES AND GREEN COMMUNITIES ACT GRANTS**

B2Q Associates has no control over the decisions of utility companies or state agencies to provide incentives or grants. Since incentives and grants are entirely at the discretion of the utility or state agency, B2Q does not expressly or implicitly warrant or represent that incentives will be awarded. However, B2Q will work within the framework of the existing programs to obtain available incentives for the Town of Natick in accordance with the rules and methods prescribed by Eversource and Commonwealth of Massachusetts. B2Q will prepare application forms on the Town's behalf and work with utility representatives and state agencies to help determine the funding levels to be provided. Eversource and the Commonwealth of Massachusetts conduct pre- and post-installation site inspections to verify existing equipment and to ensure that the installed equipment meets program specifications.

# **CONTRACT TERMS**

This proposal is valid for thirty days. All work is estimated to be done during normal daytime hours.

B2Q's aggregate, one-time liability to all claimants for any and all direct, incidental and consequential damages, both property and economic, arising in any way under this proposal, shall be limited to our fee. If this proposal is accepted by the Town, B2Q and the Town of Natick would use an updated version of the contract that was used for the Library Occupancy Sensors project.

# **GENERAL FIRM DESCRIPTION**

B2Q provides energy engineering and turn-key energy efficiency project delivery, energy audits and screening studies, commissioning and retro-commissioning, technical training, project management, design, engineering, design reviews, troubleshooting, testing, measurement and verification, metering, building simulation, building automation, cogeneration, and utility demand side management program consulting.

# **KEY PERSONNEL**

Paul Banks will be the principal in charge for this project. Mr. Banks will be responsible for the overall project staffing and quality reviews. Mr. Banks will review project deliverables prior to submission for quality assurance.

Joe Bliss will be the Project Manager. Mr. Bliss will be responsible for project specifications, installation management, and quality control.

This Agreement is made this \_\_\_\_\_day of \_\_\_\_\_, 2018, by and between the Town of Natick with an address of Natick Town Hall, 13 East Central Street, Natick, MA 01760, by the Natick Board of Selectmen (hereinafter the "Town," or the "Client"), and Hobart Energy Services, Inc., a corporation with a principal place of business at 30 Crescent Dr. Salem, MA (hereinafter the "Contractor").

The words "he," "him" and "his" in this Agreement, as far as they refer to the Contractor, shall so refer whether the Contractor is an individual, partnership or corporation. All prior contracts, if any exist between the Town and the Contractor, are hereby terminated and shall be of no force and effect.

1. Scope of Services and Scheduling

In consideration of the obligations herein contained, Contractor shall perform the work included in the scopes of work in the B2Q proposals dated March 8, 2018 (the "Project"), which is attached hereto and incorporated herein by reference. All materials shall be new and shall meet UL, Federal, State and Local code requirements. Any material change to the scope of work, including acceptance of the additional cost for the work, shall be agreed upon by both parties in writing before the work is performed. The work will be considered complete, with the exception of any minor open items, after the Client and Utility representative review and approval of the work (herein referred to as the "certificate of completion").

Contractor provides this proposal based on Prevailing wage requirements, if applicable, and all work performed during normal work week (6:00 A.M. to 3:30 P.M. local time), unless otherwise stated in the proposal (subject to M.G.L. c. 149, §34).

Contractor shall install the Project with regard for the appearance and condition of the Client's property. Waste material shall be removed daily.

The Client will cooperate and coordinate with Contractor on scheduling and maximize productivity on Energy Conservation projects. The Client will allow Contractor access to areas of the building to ensure rapid, efficient installation and completion of the Project.

Contractor shall employ the following Subcontractors to accomplish the scope of work.

- B2Q Associates, Inc. (engineering, commissioning, project management)
- Trane Company, Inc. (controls)
- Automated Logic Corporation (controls and electrical contracting)
- Enterprise Equipment Company, Inc. (mechanical contracting)
- New England Ductless (mechanical contracting)
- 2. Standard of Care

The Contractor's services shall be performed as expeditiously as is consistent with professional skill and care and the orderly progress of the work. The Contractor shall exercise due care and diligence in the rendition of all services under this Agreement in accordance with the applicable professional standards in the eastern Massachusetts area.

The Contractor's services shall be performed as expeditiously as is consistent with such standards.

3. Term

The term of this Agreement shall be for one (1) year, commencing as of the execution date of this Agreement, and ending one (1) year later.

4. Order of Priority of Agreement Documents

In the event of any conflict among the Agreement Documents, the Documents shall be construed according to the following priorities:

Highest Priority:Amendments to Agreement (if any)Second Priority:Agreement

#### 5. Payment

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In consideration for performance of the work in accordance with the requirements of this Agreement, the Client shall pay Contractor the prices in the Schedule of Values set forth in Exhibit A, which is attached hereto and incorporated by reference.

This Agreement is a fixed price/fixed rate contract; and, therefore, miscellaneous expenditures associated with Contractor's work on the Project shall not be paid by the Client. In the event that an unforeseen miscellaneous expense is incurred, Contractor shall receive the Client's approval in writing prior to incurring the expense if it will subsequently seek payment of said expense from the Client.

Payment shall be made to Contractor for work completed in accordance with this Agreement. All requests for payment shall be submitted to the Client as an invoice and shall specify work completed and progress made toward completing deliverables.

Payment will be due thirty (30) days after receipt of Contractor's invoice by the Client for services rendered in accordance with this Agreement. The Client shall not make payments in advance.

If the Client objects to all or part of any invoice, the Client shall notify the Contractor in writing within two (2) weeks of the date of receipt of the invoice, and shall pay that portion of the invoice not in dispute within thirty (30) days after the date of receipt of the invoice.

Should it be necessary for Contractor to engage the services of a specialized contractor or companies other than those originally proposed in B2Q's proposal, Contractor shall take such measures only with the Client's prior written approval. Charges for such services shall be billed directly to the Client unless otherwise agreed upon by the parties.

Payment of the amounts due under this Agreement shall release the Town of Natick and its officers, employees, boards, commissions, committees, agents and representatives,

from any and all claims and liability in any way relating to this Agreement or anything done in pursuance thereof.

No payment by the Client to Contractor shall be deemed to be a waiver of any right of the Client under this Agreement or a ratification by the Client of any breach hereof by Contractor.

#### 6. Warranty

It is understood and agreed that Contractor will perform all services hereunder in a professional manner with appropriately skilled employees or subcontractors. Contractor warrantees the workmanship for one (1) year from the date of the certificate of completion and shall assign all applicable Manufacturers' warranties for products used on the Project to the Client. Contractor shall also assist in completing all applicable warrantee registration forms and explain the warrantee process for these Manufacturer warranties.

#### 7. Compliance with Laws

Contractor shall comply with all provisions of Federal, Massachusetts and Town of Natick law applicable to his work including, without limitation, statutes, by-laws, rules, regulations, orders and directives, as amended, and including, without limitation, the Williams-Steiger Occupational Safety and Health Act, as amended, and related regulations, as amended, in effect throughout the term of this Agreement and any extension or renewal thereof. Without limitation, Contractor shall comply with the provisions of Chapter 149, Section 26 to 27D of the Massachusetts General Laws, as amended, and the applicable minimum wage rates as determined by the Massachusetts Commissioner of Labor and Industries. This Agreement shall be considered to include in their entirety all terms respecting workers' compensation insurance and other terms required to be included in it by Chapter 152 of the Massachusetts General Laws, as amended, as though such terms were set forth in their entirety herein.

#### 8. Insurance

\

Contractor shall insure and shall require each of its subcontractors to carry the following insurance to the extent stated:

- a. Workers' Compensation Insurance as required by the laws of the Commonwealth of Massachusetts and employer's liability insurance in the amount of \$1,000,000/\$1,000,000.
- b. Commercial General Liability Insurance, \$1,000,000 each occurrence and \$2,000,000 aggregate limit. Commercial General Liability insurance shall include personal injury liability, broad form property damage liability, products/completed operations liability and broad form contractual liability.
- c. Automobile Liability Insurance, covering all non-owned and hired vehicles -

Combined single limit of \$1,000,000.

- d. Professional Liability Insurance, covering errors and omissions, \$1,000,000 each claim and \$2,000,000 aggregate limit.
- e. Excess Liability Insurance, Umbrella Form \$1,000,000 each occurrence and \$2,000,000 aggregate, which shall be following form, providing coverage over commercial general liability insurance and employer's liability under workers' compensation insurance.
- f. The Town of Natick shall be named as additional insured on each such policy of Commercial General Liability Insurance and, if required, Automobile Liability Insurance.
- g. All certificates and policies shall contain the following provision:

"Notwithstanding any other provision herein, should any of the above policies be cancelled or materially amended before the expiration date thereof, the issuing company will mail thirty (30) days prior written notice thereof to the named certificate holder and to the Natick Town Administrator, Natick Town Hall, 13 East Central Street, Natick, MA 01760, before such cancellation or amendment shall take place."

- h. Certificates evidencing such insurance in five (5) copies shall be furnished to the Client at the execution of this Agreement. Such certificates shall not merely name the types of policy provided, but shall specifically refer to this Agreement and shall state that such insurance is as required by this Agreement. Contractor shall make no claims against the Town of Natick or its officers for any injury to any of its officers or employees or for damage to its equipment arising out of work contemplated by the Agreement.
- i. Contractor shall also be required to provide to the Town of Natick with its proof of insurance coverage endorsements or riders to the policies of commercial general liability insurance and, if required, automobile liability insurance, which indicate that the Town of Natick are named as additional insureds on each such policy.
- j. No insurance shall be obtained from an insurer which:
  - 1. is not licensed to sell insurance in the Commonwealth of Massachusetts; or

2. is not authorized to provide insurance as an excess or surplus lines insurer, and does not have a current Best's rating of A or better.

- k. Failure to provide and continue in force such insurance as aforesaid shall be deemed a material breach of this Agreement and shall operate as an immediate termination thereof.
- 9. Indemnification

Contractor shall compensate the Client for all damage to the Client's property of any nature arising out of Contractor's work. To the fullest extent permitted by law, Contractor shall indemnify, defend, and hold harmless the Town of Natick and all of its officers, employees, boards, commissions, committees, agents and representatives from and against all claims, causes of action, suits, costs, damages, and liability of any kind which, to the extent caused by the willful or negligent acts, errors or omissions by Contractor and those of anyone for whom Contractor is legally liable, arise out of the breach by Contractor of its obligations under this Agreement, or the act or omission of Contractor, its subcontractors, or their officers, employees, agents and representatives or anyone directly or indirectly employed by them, or anyone for whose acts or omissions they may be liable, regarding the work to be performed by Contractor under the Agreement, or which arise out of the violation of any federal, Massachusetts or Town of Natick statute, by-law, rule, regulation, order or directive, or which relate to personal injury or property damage suffered by Contractor or any of its officers, employees, or subcontractors regarding the subject matter of this Agreement. Said costs shall include, without limitation, legal costs, collections fees, and counsel fees incurred in defending any claim or suit that may be brought against the Client and any judgment that may be obtained in any such claim or suit.

#### 10. No Personal Liability

Neither the Town of Natick, nor its officers, employees, boards, committees, commissions, agents and representatives shall be under any personal obligation or incur any personal liability by reason of this Agreement, the execution thereof or anything relating thereto which arises out of the breach or violation of any provision of this Agreement, or the violation of any Federal, Massachusetts or Town of Natick statute, by-law, rule, regulation, order or directive, or which relates to personal injury or property damage suffered by Contractor, its employees, or subcontractors, regarding the subject matter of this Agreement.

#### 11. Familiarity with Area of Work

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By signing this Agreement, Contractor acknowledges that it has examined the subject matter of this Agreement, including, without limitation, the provision of energy consulting services, and that it is familiar with all sites which are the subject of this Agreement in the Town of Natick and with all conditions of this Agreement. Contractor has entered into this Agreement in reliance on its own examinations and estimates as to the amount and character of its work, and conditions which may be encountered in the performance thereof, and shall assume all risks and bear all losses pertaining thereto.

The nature of Contractor's work includes the installation of energy efficiency equipment and solutions. Contractor does not take responsibility for the following existing conditions at the Project site: existing code violations, structural issues, deteriorating wiring and hazardous material, such as asbestos, lead paint, and oil. To the extent that Contractor and/or its officers, employees, agents, subcontractors or consultants do not cause the presence of hazardous material at the Project site, Contractor and its officers,

employees, agents, subcontractors and consultants shall have no responsibility for the discovery, presence, handling, removal or disposal of, or exposure of persons to, hazardous material in any form at the Project site. If Contractor discovers hazardous material at the Project site, it shall immediately notify the Client in writing and shall refrain from disturbing or taking any action with respect to the hazardous material in the absence of the Client's written direction. In the event Contractor does disturb such hazardous material or does take such action without written direction, the limitation of liability in this paragraph shall not apply.

12. Performance Bond

DELETED - NOT APPLICABLE.

13. Labor and Materials Payment Bond\_

DELETED – NOT APPLICABLE.

14. Independent Contractor Status

Contractor shall provide services under this Agreement as an independent contractor with the Town of Natick and not as an employee of the Town. No employee, agent or representative of Contractor shall be entitled to receive any benefits of employment with the Town of Natick, including without limitation salary, overtime, vacation pay, holiday pay, sick leave, health insurance, life insurance, pension or deferred compensation.

15. Use of Alcohol and Controlled Substances Prohibited

Contractor hereby acknowledges that the use of alcoholic beverages, narcotics, and mood altering substances, except for current valid, legal prescriptions, by any officer, employee, agent, or representative of Contractor is prohibited on Town property which is the subject matter of this Agreement and during all hours of work under this Agreement. If any officer, employee, agent, or representative of Contractor violates the foregoing provision, the Client shall have the right to order that such officer, employee, agent, or representative of Contractor shall not be permitted to return to work on this Agreement. Under such circumstances, Contractor shall promptly remove the subject officer, employee, agent, or representative from the job site and shall not permit the subject officer, employee, agent, or representative to perform further work in conjunction with this Agreement.

16. No Smoking

Pursuant to Massachusetts General Laws (M.G.L.) c. 270, §22, the Commonwealth of Massachusetts Smokefree Workplace Law, Contractor, its officers, employees, agents, subcontractors, and representatives shall refrain from smoking and from using tobacco products in any public building in the Town of Natick.

17. Criminal Background Screening

For each employee of Contractor who is performing services under this Agreement, Contractor shall, subject to its confidentiality and privacy obligations owing to its employees and third parties, provide a written confirmation to the Client that such employee passed Contractor's pre-employment criminal background screen. In the event that any employee refuses to permit Contractor to provide such information to the Client, Contractor shall not assign such employee to perform services for the Client, and such employee shall not be authorized to perform services for the Client. The Client shall be permitted to keep such information in its files.

#### 18. Delays/Force Majeure

Except as specifically set forth in this Agreement, neither party shall hold the other responsible or liable for damages or delays in performance caused by acts of God, interruptions in the availability of labor, or other events beyond the control of the other party, or that could not have been reasonably foreseen or prevented. For this purpose, such acts or events shall include unusually severe weather affecting performance of services, floods, epidemics, wars, riots, strikes, lockouts, or other industrial disturbances, protest demonstrations, and project site conditions which could not have been reasonably anticipated. Should such acts or events occur, both parties shall use their best efforts to overcome the difficulties arising and to resume as soon as reasonably possible the normal pursuit of the services for the Project.

#### 19. Termination

- a. If Contractor shall breach any provision of this Agreement, which breach is not cured within twenty-one (21) days of written notice thereof from the Client to Contractor, the Client shall have the right to terminate this Agreement upon written notice to Contractor.
- b. If any assignment shall be made by Contractor or by any guarantor of Contractor for the benefit of creditors, or if a petition is filed by Contractor or by any guarantor of Contractor for adjudication as a bankrupt, or for reorganization or an arrangement under any provision of the Bankruptcy Act as then in force and effect, or if an involuntary petition under any of the provisions of the Bankruptcy Act is filed against Contractor and such involuntary petition is not discharged within ninety (90) days thereafter, in any event the Client may terminate this Agreement upon written notice to Contractor.
- c. The award of this Agreement and the continued operation of this Agreement are contingent upon appropriation by Natick Town Meeting of sufficient money to fund the Agreement. Should Natick Town Meeting fail to appropriate necessary funds therefor, the Client shall no longer be under any obligation to tender performance, including payment, under the terms of this Agreement. In that event, the Client may terminate this Agreement upon written notice to Contractor.
- d. The Client may terminate this Agreement upon written notice to Contractor if a source of money to fund the Agreement is lost during the Agreement term. In the alternative, the parties may agree in writing to amend the

Agreement to provide for an Agreement price which represents a reduced appropriation for the Agreement term.

e. The Client may also terminate this Agreement for convenience upon thirty (30) days' written notice to Contractor.

In the event of termination Contractor shall be entitled to be paid for services rendered in accordance with this Agreement prior to termination.

In the event that this Agreement is terminated pursuant to Section a. or b. above, the Client may make any reasonable purchase or contract to purchase services in substitution for services due from Contractor and may deduct the cost of any substitute contract, or damages sustained by the Client due to non-performance or non-conformance of services together with incidental and consequential damages from the Agreement price, and shall withhold such damages from sums due or sums which become due.

#### 20. Notices

Except as otherwise provided in this Agreement all notices required or permitted to be given hereunder shall be in writing and shall be delivered by certified mail or registered mail, return receipt requested, to the parties at the following address or such other address or addresses as to which a party shall have notified the other party in accordance with this Section.

If to the Town of Natick:	Melissa A. Malone Town of Natick 13 East Central Street Natick, MA 01760
With copies to:	Karis North, Esq. Murphy, Hesse, Toomey & Lehane, LLP 300 Crown Colony Drive, Suite 410 Quincy, MA 02169
If to Contractor:	Ed Skeffington Hobart Energy Services, Inc. 30 Crescent Dr. Salem, MA 01970

#### 21. Miscellaneous Provisions

- a. Any action at law or suit in equity instituted by Contractor as a result of the performance, non-performance or alleged breach of this Agreement shall be filed in the Superior Court of the Commonwealth of Massachusetts for Middlesex County, MA, and in no other court or jurisdiction.
- b. No action or failure to act by either party shall constitute a waiver of a right or

duty afforded to that party under the Agreement, nor shall such action or failure to act constitute approval of or acquiescence in a breach thereunder, except as may be specifically agreed in writing. No forbearance or indulgence in any form or manner by either party shall be construed as a waiver or in any way limit the legal or equitable remedies available to that party. No waiver by either party of any default or breach by the other party shall constitute a waiver of any subsequent default or breach.

- c. If Contractor discovers or is informed of any discrepancy or inconsistency in the Agreement Documents in relation to any law, statute, ordinance, by-law, decree, code, rule, regulation, or order, Contractor shall promptly, before commencing services under this Agreement, report the same to the Client in writing.
- d. Contractor acknowledges that it has not been influenced to enter into this Agreement, nor has Contractor relied upon any warranties or representations not set forth in this instrument.
- e. Contractor shall maintain the confidentiality of information designated by the Client as confidential, unless withholding such information would violate the law or create a risk of significant harm to the public, or unless Contractor has been required to release such information by final judgment or order of a court of competent jurisdiction, or unless the Client has expressly waived such confidentiality in advance in writing.
- g. Contractor shall not represent or purport to represent that it speaks for the Client vis-à-vis the media or the public at-large without the Client's express, written consent in advance.
- h. Prior to commencing services under this Agreement, Contractor shall furnish the Client, in writing, the names, addresses and telephone numbers of not fewer than two (2) principal employees of his business who are to be contacted in the event of an after-hours emergency.
- i. By entering into this Agreement, Contractor certifies under penalties of perjury that its entry was made and submitted in good faith and without collusion or fraud with any person. As used in this certification, the word "person" shall mean any natural person, business, partnership, corporation, union, committee, club, or other organization, entity, or group of individuals.
- j. By entering into this Agreement, Contractor certifies under the penalties of perjury, pursuant to M.G.L. c.62C, Section 49A(b), that it has complied with all laws of the Commonwealth relating to taxes, to reporting of employees and contractors, and to withholding and remitting child support.
- k. Prevailing wage rates, as contained in the Bid documents, shall be paid, pursuant to M.G.L. c.149, §§26-27G, if they are applicable.
- 1. Contractor understands that the Massachusetts Conflict of Interest Law, Chapter

268A of the Massachusetts General Laws, applies to Contractor with respect to the services required to be provided under this Agreement. Contractor and its officers, employees, agents, subcontractors and affiliated agencies shall not participate in any activity which constitutes a violation of the Massachusetts Conflict of Interest Law or which creates an appearance of a violation of the Massachusetts Conflict of Interest Law.

- Contractor shall not discriminate against or exclude any person from m. participation herein on grounds of race, color, religious creed, national origin, sex, gender identity, sexual orientation (which shall not include persons whose sexual orientation involves minor children as the sex object), age, genetic information, ancestry, children, marital status, veteran status or membership in the armed services, the receiving of public assistance, and handicap. The previous sentence shall include, but not be limited to, the following: advertising, recruitment; hiring; rates of pay or other forms of compensation; terms; conditions or privileges of employment; employment upgrading; transfer; demotion; layoff; and termination. Contractor shall take affirmative actions to insure that applicants are employed, and that employees are treated during their employment, without regard to race, color, religious creed, national origin, sex, gender identity, sexual orientation (which shall not include persons whose sexual orientation involves minor children as the sex object), age, genetic information, ancestry, children, marital status, veteran status or membership in the armed services, the receiving of public assistance, and handicap.
- n. To the extent that any of the foregoing sections required by Massachusetts law are inconsistent with other, non-statutory sections in this Agreement, any statutorily-mandated provisions contained herein shall control.
- o. Contractor shall not assign or subcontract in whole or in part this Agreement or in any way transfer any interest in this Agreement, other than the Subcontractors listed above, without the prior express written approval of the Client.
- p. This Agreement may be amended only by written consent of both parties.
- q. Contractor shall not assign any money due or to become due to Contractor unless the Client shall have received prior written notice of such assignment. No such assignment shall relieve Contractor of its obligations under this Agreement.
- r. If any provision, or portion thereof, of this Agreement shall be adjudged to be invalid or unenforceable by final judgment or order of a court of competent jurisdiction, the remaining provisions of the Agreement shall continue in effect to the extent permitted by law.
- s. The provisions of this Agreement shall be binding upon and inure to the benefit of the heirs, assigns and successors in interest of the parties.
- t. This Agreement shall be governed by and construed in accordance with the laws of the Commonwealth of Massachusetts, regardless of choice of law issues or

principles.

u. This Agreement is executed in triplicate as a sealed instrument.

(The remainder of this page is left intentionally blank.)

 The Town of Natick, Massachusetts
 Hobart Energy Services, Inc.

 By: The Natick Board of Selectmen
 By:

 Amy K. Mistrot, Chair
 Signature

 Susan G. Salamoff, Vice Chair
 Printed Name

 Michael J. Hickey, Jr., Clerk
 Printed Title

 Jonathan Freedman
 Dated:

 Dated:
 Dated:

## APPROVED AS TO AVAILABILITY OF APPROPRIATION:

In accordance with the requirements of M.G.L. Chapter 44, Section 31C, this is to certify that an appropriation in the amount of this Agreement is available therefor, and that the Natick Board of Selectmen is authorized to execute this Agreement and to approve all requisitions and execute change orders.

Arti P. Mehta Comptroller, Town of Natick

APPROVED AS TO FORM ONLY, AND NOT AS TO SUBSTANCE:

Karis North, Esq.

Dated:

Dated:

## CERTIFICATE OF VOTE

I,			, hereby cer	rtify
(Clerl	k/Secretary)			
that I am the duly	y qualified and acti	ing		of (Corporation
Name)			(Title)	(Corporation
	20, at which	ng of the Directors of a meeting all Directors		
		er either		,
(Name)	(Title)			
(Name)	(Title)	; or		
(Name)	(Title),			
any o	ne acting singly, to	o execute all contracts	and bonds on behal	If of the Corporation.
	that the above vote changed or modif	e is still in effect on th ied in any respect.	is the day of _	, 20
	Signature			
	Printed Na	ime		

Printed Title

The certification contained hereabove shall be executed by Contractor or copy of current "certification of authority to sign for the Corporation" shall be attached.)

#### **Exhibit A: Project Cost and Payment Terms**

<b>Company Name:</b>	Town of Natick
<b>Billing Address:</b>	13 East Central Street, Natick Town Hall, Natick, MA 01760

#### Purchase Order/Contract #:

Project Cost:	
Labor, Material, Disposal Costs	\$40,844.00
Sales Tax on Material	N/A
Total Project Cost	\$40,844.00
<i>Less: *ESTIMATED Project Incentives</i> <u>Utility</u> <u>App #</u> Eversource	\$1,400.00
Total Incentives	\$1,400.00
Net Project Cost to Client	\$39,444.00

#### Note:

#### **Project Payment Terms:**

Amount to be paid by the Client to Contractor	\$39,444.00
(Payable 30 days after invoice date))	

Amount to be paid by Utilities to Contractor\$1,400.00(Contractor will collect this amount directly from the Utilities)

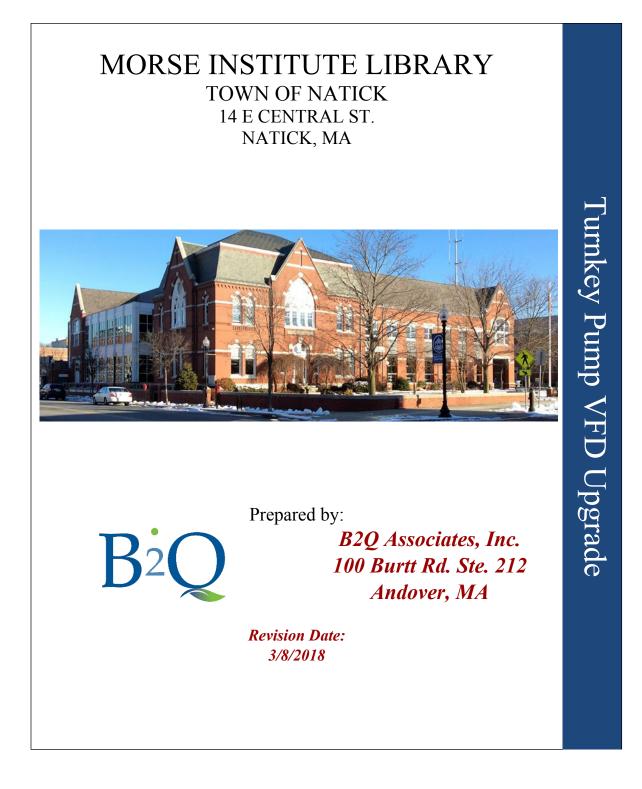
#### Total Project Cost \$40,844.00

#### **Schedule of Values:**

Mobilization Fee	\$10,000.00	Billed at Project Commencement for Purchase of Materials
Installation of Equipment	\$20,000.00	
Programming, Commissioning, and Closeout	\$5,499.60	Substantial Completion
Retainage	\$3,944.40	10%
Total Contract Amount	\$39,444.00	

The final invoice date will be determined by the "Certificate of Completion" as described in the Terms & Conditions.

Exhibit B: Project Proposal See next page.





B2Q Associates, Inc. 100 Burtt Rd. Suite 212 Andover, MA 01810 (978) 208 – 0609 www.b2qassociates.com

March 8, 2018

Ms. Jillian Wilson-Martin Sustainability Coordinator Town of Natick 75 West St. Natick, MA 01760

## **RE:** Proposal for Turnkey CHW Pump VFD Upgrade in Morse Institute Library

Dear Jillian,

B2Q is pleased to provide you with this proposal to provide turnkey project services for a potential CHW pump VFD upgrade project at the Morse Institute Library, located at 14 E Central St. in Natick, MA. B2Q has surveyed the facility with the intent of developing projects for which the Town can submit requests for Green Communities Act grant funding. The Town has shown a commitment to energy savings in the Library with HVAC occupancy sensor and lighting retrofit projects happening in 2017. This project will further contribute to the cost saving and carbon reducing goals for this facility.

# **ECONOMICS SUMMARY**

The estimated economics for this project are given in the table below. Eversource published incentive programs offer a \$1,400 incentive payment and the Green Communities Act grant may cover up to the remainder of the project cost after utility incentive.

1	CHW Pump-7 VFI	D and Moto	or R	etrofit	
		%		Cost	
Utility	Savings Units	Savings		Saving	s
Electricity	22,046 kWh	3.4%	\$	3,086	/yr
Natural Gas	0 therms	-	\$	-	/yr
Total Energy	75 MMBtu		\$	3,086	/yr
Implementati		\$	44,344		
Electric Utility		\$	1,400		
Net Cost		\$	42,944		
Simple Payba			13.91	yr	

# **ENVIRONMENTAL IMPACT**

its are summa	arized in the tab	le belo	W.				
1	CHW Pump-7 VF	D and M	lotor F	Retrofi	t		
	Equivalen	t Emissi	ons Re	eductio	ons		
Utility	Energy Savings	CO <sub>2</sub>	NOx	SOx	Gasoline	Trees	Homes
-		lb <sub>e</sub>	lb <sub>e</sub>	lb <sub>e</sub>	gal	-	-
Electricity	22,046 kWh	15,919	66	189	811	185	0.7

0

75 MMBtu 15,919 66

0

0 therms

0

189

0

811

0.0

0.7

0

185

The proposed project would result in net emissions reductions for the Town of Natick. These results are summarized in the table below.

# PROJECT DESCRIPTION

Natural Gas

The scope of the project is the installation, programming, testing of a new variable frequency drive (VFD) for CHW pump-7 in the basement mechanical room. All work can be completed in the basement and penthouse mechanical rooms, meaning no impact on Library staff or patrons. Currently, CHW pump-7 runs at full speed whenever there is a need for cooling, independent of how much cooling is needed. The result of this style of operation is often poor equipment performance and wasted energy. The new VFD would change the pump's speed automatically based on feedback from the building about how much cooling is needed. This saves energy without impacting the system's ability to keep the building cool.

B2Q intends to work with Trane Company, who already provides service for the controls system in the facility. Trane's electricians would install the new VFD on the wall in the basement mechanical room, wire it to existing CHW pump, and then modify the programming of the controller to implement the new sequence of operation. They will also be responsible for upgrading the control graphics, commissioning the system with B2Q's help, and training the building's custodian(s) on how the new equipment should run. A separate mechanical contractor, Enterprise Equipment, will install a differential pressure sensor in the piping of the penthouse mechanical room to provide feedback to the controls. Finally, Air Masters HVAC, who manage the Tridium overlay controls system, will be on-site briefly to update their controls graphics to show the new VFDs, so that there is no confusion for operators between the Trane and Tridium systems. As mentioned above, all work can be done inside mechanical rooms and during normal business hours, meaning minimal interference with or demand of Library and Facilities staff.

The proposed structure of the project is that B2Q would deliver this project to the Town of Natick as a turnkey vendor. This means that the Town would only need to have one contract and write one purchase order for this project. B2Q would hire the mechanical and controls contractors as subcontractors and would pay them out of the single purchase order provided by the Town. In addition to hiring and managing the subcontractors, B2Q would provide the following services. See the Appendices for more information on our scope of work, including assumptions and exclusions.

- Energy savings analysis and calculations to a level of detail and accuracy that is typically required by Eversource and the Green Communities Act program administrators to secure funding.
- Eversource utility incentive applications.
- Green Communities Act grant applications.
- Contractor observation during construction.
- Commissioning of the newly-installed equipment after construction to verify proper operation
- Project management throughout construction, including construction schedule, building access, and coordination with the Town

# **SCHEDULE**

- B2Q and its subcontractors shall begin work within (2) weeks of receiving a purchase order from the Town of Natick.
- Installation of the VFD shall be complete within (3) weeks of project commencement.
- Programming and commissioning of the project shall be complete within (3) weeks of completing the VFD installation.

We thank you for the opportunity to provide you with this proposal and look forward to working with you on this project if selected.

Thank you,

# Paul Banks

Paul Banks, PE Principal B2Q Associates, Inc.

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# **APPENDICES**

# ASSUMPTIONS AND EXCLUSIONS

- 1. The above schedule and price are contingent upon B2Q and its subcontractors having consistent access to the facility. B2Q is not responsible for delays caused by restricted access to specific areas of the building and/or the building as a whole.
- 2. This proposal does not include any work associated with issues caused by hidden conditions or correction of existing code violations.

# **ENERGY CONSUMPTION ESTIMATES**

B2Q's energy cost savings estimates above are based on an average billing rate of \$0.14/kWh and \$1.05/therm, as specific information from the Town was not available at the time of this proposal. If necessary, B2Q can update the above analysis based on updated information provided by the Town.

B2Q has no control of the actual building and equipment operation or over other variables which may affect energy consumption and/or associated costs or savings. Accordingly, B2Q does not expressly or implicitly warrant or represent that energy consumption savings and cost savings estimates of the building or equipment operation will be the actual operation energy and cost savings.

# **UTILITY INCENTIVES AND GREEN COMMUNITIES ACT GRANTS**

B2Q Associates has no control over the decisions of utility companies or state agencies to provide incentives or grants. Since incentives and grants are entirely at the discretion of the utility or state agency, B2Q does not expressly or implicitly warrant or represent that incentives will be awarded. However, B2Q will work within the framework of the existing programs to obtain available incentives for the Town of Natick in accordance with the rules and methods prescribed by Eversource and Commonwealth of Massachusetts. B2Q will prepare application forms on the Town's behalf and work with utility representatives and state agencies to help determine the funding levels to be provided. Eversource and the Commonwealth of Massachusetts conduct pre- and post-installation site inspections to verify existing equipment and to ensure that the installed equipment meets program specifications.

# **CONTRACT TERMS**

This proposal is valid for thirty days. All work is estimated to be done during normal daytime hours.

B2Q's aggregate, one-time liability to all claimants for any and all direct, incidental and consequential damages, both property and economic, arising in any way under this proposal, shall be limited to our fee. If this proposal is accepted by the Town, B2Q and the Town of Natick would use an updated version of the contract that was used for the

Library Occupancy Sensors project.

# **GENERAL FIRM DESCRIPTION**

B2Q provides energy engineering and turn-key energy efficiency project delivery, energy audits and screening studies, commissioning and retro-commissioning, technical training, project management, design, engineering, design reviews, troubleshooting, testing, measurement and verification, metering, building simulation, building automation, cogeneration, and utility demand side management program consulting.

## **KEY PERSONNEL**

Paul Banks will be the principal in charge for this project. Mr. Banks will be responsible for the overall project staffing and quality reviews. Mr. Banks will review project deliverables prior to submission for quality assurance.

Joe Bliss will be the Project Manager. Mr. Bliss will be responsible for project specifications, installation management, and quality control.

This Agreement is made this \_\_\_\_\_day of \_\_\_\_\_, 2018, by and between the Town of Natick with an address of Natick Town Hall, 13 East Central Street, Natick, MA 01760, by the Natick Board of Selectmen (hereinafter the "Town," or the "Client"), and Hobart Energy Services, Inc., a corporation with a principal place of business at 30 Crescent Dr. Salem, MA (hereinafter the "Contractor").

The words "he," "him" and "his" in this Agreement, as far as they refer to the Contractor, shall so refer whether the Contractor is an individual, partnership or corporation. All prior contracts, if any exist between the Town and the Contractor, are hereby terminated and shall be of no force and effect.

1. Scope of Services and Scheduling

In consideration of the obligations herein contained, Contractor shall perform the work included in the scopes of work in the B2Q proposals dated March 8, 2018 (the "Project"), which is attached hereto and incorporated herein by reference. All materials shall be new and shall meet UL, Federal, State and Local code requirements. Any material change to the scope of work, including acceptance of the additional cost for the work, shall be agreed upon by both parties in writing before the work is performed. The work will be considered complete, with the exception of any minor open items, after the Client and Utility representative review and approval of the work (herein referred to as the "certificate of completion").

Contractor provides this proposal based on Prevailing wage requirements, if applicable, and all work performed during normal work week (6:00 A.M. to 3:30 P.M. local time), unless otherwise stated in the proposal (subject to M.G.L. c. 149, §34).

Contractor shall install the Project with regard for the appearance and condition of the Client's property. Waste material shall be removed daily.

The Client will cooperate and coordinate with Contractor on scheduling and maximize productivity on Energy Conservation projects. The Client will allow Contractor access to areas of the building to ensure rapid, efficient installation and completion of the Project.

Contractor shall employ the following Subcontractors to accomplish the scope of work.

- B2Q Associates, Inc. (engineering, commissioning, project management)
- Trane Company, Inc. (controls)
- Automated Logic Corporation (controls and electrical contracting)
- Enterprise Equipment Company, Inc. (mechanical contracting)
- New England Ductless (mechanical contracting)
- 2. Standard of Care

The Contractor's services shall be performed as expeditiously as is consistent with professional skill and care and the orderly progress of the work. The Contractor shall exercise due care and diligence in the rendition of all services under this Agreement in accordance with the applicable professional standards in the eastern Massachusetts area.

The Contractor's services shall be performed as expeditiously as is consistent with such standards.

3. Term

The term of this Agreement shall be for one (1) year, commencing as of the execution date of this Agreement, and ending one (1) year later.

4. Order of Priority of Agreement Documents

In the event of any conflict among the Agreement Documents, the Documents shall be construed according to the following priorities:

Highest Priority:Amendments to Agreement (if any)Second Priority:Agreement

#### 5. Payment

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In consideration for performance of the work in accordance with the requirements of this Agreement, the Client shall pay Contractor the prices in the Schedule of Values set forth in Exhibit A, which is attached hereto and incorporated by reference.

This Agreement is a fixed price/fixed rate contract; and, therefore, miscellaneous expenditures associated with Contractor's work on the Project shall not be paid by the Client. In the event that an unforeseen miscellaneous expense is incurred, Contractor shall receive the Client's approval in writing prior to incurring the expense if it will subsequently seek payment of said expense from the Client.

Payment shall be made to Contractor for work completed in accordance with this Agreement. All requests for payment shall be submitted to the Client as an invoice and shall specify work completed and progress made toward completing deliverables.

Payment will be due thirty (30) days after receipt of Contractor's invoice by the Client for services rendered in accordance with this Agreement. The Client shall not make payments in advance.

If the Client objects to all or part of any invoice, the Client shall notify the Contractor in writing within two (2) weeks of the date of receipt of the invoice, and shall pay that portion of the invoice not in dispute within thirty (30) days after the date of receipt of the invoice.

Should it be necessary for Contractor to engage the services of a specialized contractor or companies other than those originally proposed in B2Q's proposal, Contractor shall take such measures only with the Client's prior written approval. Charges for such services shall be billed directly to the Client unless otherwise agreed upon by the parties.

Payment of the amounts due under this Agreement shall release the Town of Natick and its officers, employees, boards, commissions, committees, agents and representatives,

from any and all claims and liability in any way relating to this Agreement or anything done in pursuance thereof.

No payment by the Client to Contractor shall be deemed to be a waiver of any right of the Client under this Agreement or a ratification by the Client of any breach hereof by Contractor.

#### 6. Warranty

It is understood and agreed that Contractor will perform all services hereunder in a professional manner with appropriately skilled employees or subcontractors. Contractor warrantees the workmanship for one (1) year from the date of the certificate of completion and shall assign all applicable Manufacturers' warranties for products used on the Project to the Client. Contractor shall also assist in completing all applicable warrantee registration forms and explain the warrantee process for these Manufacturer warranties.

#### 7. Compliance with Laws

Contractor shall comply with all provisions of Federal, Massachusetts and Town of Natick law applicable to his work including, without limitation, statutes, by-laws, rules, regulations, orders and directives, as amended, and including, without limitation, the Williams-Steiger Occupational Safety and Health Act, as amended, and related regulations, as amended, in effect throughout the term of this Agreement and any extension or renewal thereof. Without limitation, Contractor shall comply with the provisions of Chapter 149, Section 26 to 27D of the Massachusetts General Laws, as amended, and the applicable minimum wage rates as determined by the Massachusetts Commissioner of Labor and Industries. This Agreement shall be considered to include in their entirety all terms respecting workers' compensation insurance and other terms required to be included in it by Chapter 152 of the Massachusetts General Laws, as amended, as though such terms were set forth in their entirety herein.

#### 8. Insurance

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Contractor shall insure and shall require each of its subcontractors to carry the following insurance to the extent stated:

- a. Workers' Compensation Insurance as required by the laws of the Commonwealth of Massachusetts and employer's liability insurance in the amount of \$1,000,000/\$1,000,000.
- b. Commercial General Liability Insurance, \$1,000,000 each occurrence and \$2,000,000 aggregate limit. Commercial General Liability insurance shall include personal injury liability, broad form property damage liability, products/completed operations liability and broad form contractual liability.
- c. Automobile Liability Insurance, covering all non-owned and hired vehicles -

Combined single limit of \$1,000,000.

- d. Professional Liability Insurance, covering errors and omissions, \$1,000,000 each claim and \$2,000,000 aggregate limit.
- e. Excess Liability Insurance, Umbrella Form \$1,000,000 each occurrence and \$2,000,000 aggregate, which shall be following form, providing coverage over commercial general liability insurance and employer's liability under workers' compensation insurance.
- f. The Town of Natick shall be named as additional insured on each such policy of Commercial General Liability Insurance and, if required, Automobile Liability Insurance.
- g. All certificates and policies shall contain the following provision:

"Notwithstanding any other provision herein, should any of the above policies be cancelled or materially amended before the expiration date thereof, the issuing company will mail thirty (30) days prior written notice thereof to the named certificate holder and to the Natick Town Administrator, Natick Town Hall, 13 East Central Street, Natick, MA 01760, before such cancellation or amendment shall take place."

- h. Certificates evidencing such insurance in five (5) copies shall be furnished to the Client at the execution of this Agreement. Such certificates shall not merely name the types of policy provided, but shall specifically refer to this Agreement and shall state that such insurance is as required by this Agreement. Contractor shall make no claims against the Town of Natick or its officers for any injury to any of its officers or employees or for damage to its equipment arising out of work contemplated by the Agreement.
- i. Contractor shall also be required to provide to the Town of Natick with its proof of insurance coverage endorsements or riders to the policies of commercial general liability insurance and, if required, automobile liability insurance, which indicate that the Town of Natick are named as additional insureds on each such policy.
- j. No insurance shall be obtained from an insurer which:
  - 1. is not licensed to sell insurance in the Commonwealth of Massachusetts; or

2. is not authorized to provide insurance as an excess or surplus lines insurer, and does not have a current Best's rating of A or better.

- k. Failure to provide and continue in force such insurance as aforesaid shall be deemed a material breach of this Agreement and shall operate as an immediate termination thereof.
- 9. Indemnification

Contractor shall compensate the Client for all damage to the Client's property of any nature arising out of Contractor's work. To the fullest extent permitted by law, Contractor shall indemnify, defend, and hold harmless the Town of Natick and all of its officers, employees, boards, commissions, committees, agents and representatives from and against all claims, causes of action, suits, costs, damages, and liability of any kind which, to the extent caused by the willful or negligent acts, errors or omissions by Contractor and those of anyone for whom Contractor is legally liable, arise out of the breach by Contractor of its obligations under this Agreement, or the act or omission of Contractor, its subcontractors, or their officers, employees, agents and representatives or anyone directly or indirectly employed by them, or anyone for whose acts or omissions they may be liable, regarding the work to be performed by Contractor under the Agreement, or which arise out of the violation of any federal, Massachusetts or Town of Natick statute, by-law, rule, regulation, order or directive, or which relate to personal injury or property damage suffered by Contractor or any of its officers, employees, or subcontractors regarding the subject matter of this Agreement. Said costs shall include, without limitation, legal costs, collections fees, and counsel fees incurred in defending any claim or suit that may be brought against the Client and any judgment that may be obtained in any such claim or suit.

#### 10. No Personal Liability

Neither the Town of Natick, nor its officers, employees, boards, committees, commissions, agents and representatives shall be under any personal obligation or incur any personal liability by reason of this Agreement, the execution thereof or anything relating thereto which arises out of the breach or violation of any provision of this Agreement, or the violation of any Federal, Massachusetts or Town of Natick statute, by-law, rule, regulation, order or directive, or which relates to personal injury or property damage suffered by Contractor, its employees, or subcontractors, regarding the subject matter of this Agreement.

#### 11. Familiarity with Area of Work

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By signing this Agreement, Contractor acknowledges that it has examined the subject matter of this Agreement, including, without limitation, the provision of energy consulting services, and that it is familiar with all sites which are the subject of this Agreement in the Town of Natick and with all conditions of this Agreement. Contractor has entered into this Agreement in reliance on its own examinations and estimates as to the amount and character of its work, and conditions which may be encountered in the performance thereof, and shall assume all risks and bear all losses pertaining thereto.

The nature of Contractor's work includes the installation of energy efficiency equipment and solutions. Contractor does not take responsibility for the following existing conditions at the Project site: existing code violations, structural issues, deteriorating wiring and hazardous material, such as asbestos, lead paint, and oil. To the extent that Contractor and/or its officers, employees, agents, subcontractors or consultants do not cause the presence of hazardous material at the Project site, Contractor and its officers,

employees, agents, subcontractors and consultants shall have no responsibility for the discovery, presence, handling, removal or disposal of, or exposure of persons to, hazardous material in any form at the Project site. If Contractor discovers hazardous material at the Project site, it shall immediately notify the Client in writing and shall refrain from disturbing or taking any action with respect to the hazardous material in the absence of the Client's written direction. In the event Contractor does disturb such hazardous material or does take such action without written direction, the limitation of liability in this paragraph shall not apply.

12. Performance Bond

DELETED - NOT APPLICABLE.

13. Labor and Materials Payment Bond\_

DELETED – NOT APPLICABLE.

14. Independent Contractor Status

Contractor shall provide services under this Agreement as an independent contractor with the Town of Natick and not as an employee of the Town. No employee, agent or representative of Contractor shall be entitled to receive any benefits of employment with the Town of Natick, including without limitation salary, overtime, vacation pay, holiday pay, sick leave, health insurance, life insurance, pension or deferred compensation.

15. Use of Alcohol and Controlled Substances Prohibited

Contractor hereby acknowledges that the use of alcoholic beverages, narcotics, and mood altering substances, except for current valid, legal prescriptions, by any officer, employee, agent, or representative of Contractor is prohibited on Town property which is the subject matter of this Agreement and during all hours of work under this Agreement. If any officer, employee, agent, or representative of Contractor violates the foregoing provision, the Client shall have the right to order that such officer, employee, agent, or representative of Contractor shall not be permitted to return to work on this Agreement. Under such circumstances, Contractor shall promptly remove the subject officer, employee, agent, or representative from the job site and shall not permit the subject officer, employee, agent, or representative to perform further work in conjunction with this Agreement.

16. No Smoking

Pursuant to Massachusetts General Laws (M.G.L.) c. 270, §22, the Commonwealth of Massachusetts Smokefree Workplace Law, Contractor, its officers, employees, agents, subcontractors, and representatives shall refrain from smoking and from using tobacco products in any public building in the Town of Natick.

17. Criminal Background Screening

For each employee of Contractor who is performing services under this Agreement, Contractor shall, subject to its confidentiality and privacy obligations owing to its employees and third parties, provide a written confirmation to the Client that such employee passed Contractor's pre-employment criminal background screen. In the event that any employee refuses to permit Contractor to provide such information to the Client, Contractor shall not assign such employee to perform services for the Client, and such employee shall not be authorized to perform services for the Client. The Client shall be permitted to keep such information in its files.

#### 18. Delays/Force Majeure

Except as specifically set forth in this Agreement, neither party shall hold the other responsible or liable for damages or delays in performance caused by acts of God, interruptions in the availability of labor, or other events beyond the control of the other party, or that could not have been reasonably foreseen or prevented. For this purpose, such acts or events shall include unusually severe weather affecting performance of services, floods, epidemics, wars, riots, strikes, lockouts, or other industrial disturbances, protest demonstrations, and project site conditions which could not have been reasonably anticipated. Should such acts or events occur, both parties shall use their best efforts to overcome the difficulties arising and to resume as soon as reasonably possible the normal pursuit of the services for the Project.

#### 19. Termination

- a. If Contractor shall breach any provision of this Agreement, which breach is not cured within twenty-one (21) days of written notice thereof from the Client to Contractor, the Client shall have the right to terminate this Agreement upon written notice to Contractor.
- b. If any assignment shall be made by Contractor or by any guarantor of Contractor for the benefit of creditors, or if a petition is filed by Contractor or by any guarantor of Contractor for adjudication as a bankrupt, or for reorganization or an arrangement under any provision of the Bankruptcy Act as then in force and effect, or if an involuntary petition under any of the provisions of the Bankruptcy Act is filed against Contractor and such involuntary petition is not discharged within ninety (90) days thereafter, in any event the Client may terminate this Agreement upon written notice to Contractor.
- c. The award of this Agreement and the continued operation of this Agreement are contingent upon appropriation by Natick Town Meeting of sufficient money to fund the Agreement. Should Natick Town Meeting fail to appropriate necessary funds therefor, the Client shall no longer be under any obligation to tender performance, including payment, under the terms of this Agreement. In that event, the Client may terminate this Agreement upon written notice to Contractor.
- d. The Client may terminate this Agreement upon written notice to Contractor if a source of money to fund the Agreement is lost during the Agreement term. In the alternative, the parties may agree in writing to amend the

Agreement to provide for an Agreement price which represents a reduced appropriation for the Agreement term.

e. The Client may also terminate this Agreement for convenience upon thirty (30) days' written notice to Contractor.

In the event of termination Contractor shall be entitled to be paid for services rendered in accordance with this Agreement prior to termination.

In the event that this Agreement is terminated pursuant to Section a. or b. above, the Client may make any reasonable purchase or contract to purchase services in substitution for services due from Contractor and may deduct the cost of any substitute contract, or damages sustained by the Client due to non-performance or non-conformance of services together with incidental and consequential damages from the Agreement price, and shall withhold such damages from sums due or sums which become due.

#### 20. Notices

Except as otherwise provided in this Agreement all notices required or permitted to be given hereunder shall be in writing and shall be delivered by certified mail or registered mail, return receipt requested, to the parties at the following address or such other address or addresses as to which a party shall have notified the other party in accordance with this Section.

If to the Town of Natick:	Melissa A. Malone Town of Natick 13 East Central Street Natick, MA 01760
With copies to:	Karis North, Esq. Murphy, Hesse, Toomey & Lehane, LLP 300 Crown Colony Drive, Suite 410 Quincy, MA 02169
If to Contractor:	Ed Skeffington Hobart Energy Services, Inc. 30 Crescent Dr. Salem, MA 01970

#### 21. Miscellaneous Provisions

- a. Any action at law or suit in equity instituted by Contractor as a result of the performance, non-performance or alleged breach of this Agreement shall be filed in the Superior Court of the Commonwealth of Massachusetts for Middlesex County, MA, and in no other court or jurisdiction.
- b. No action or failure to act by either party shall constitute a waiver of a right or

duty afforded to that party under the Agreement, nor shall such action or failure to act constitute approval of or acquiescence in a breach thereunder, except as may be specifically agreed in writing. No forbearance or indulgence in any form or manner by either party shall be construed as a waiver or in any way limit the legal or equitable remedies available to that party. No waiver by either party of any default or breach by the other party shall constitute a waiver of any subsequent default or breach.

- c. If Contractor discovers or is informed of any discrepancy or inconsistency in the Agreement Documents in relation to any law, statute, ordinance, by-law, decree, code, rule, regulation, or order, Contractor shall promptly, before commencing services under this Agreement, report the same to the Client in writing.
- d. Contractor acknowledges that it has not been influenced to enter into this Agreement, nor has Contractor relied upon any warranties or representations not set forth in this instrument.
- e. Contractor shall maintain the confidentiality of information designated by the Client as confidential, unless withholding such information would violate the law or create a risk of significant harm to the public, or unless Contractor has been required to release such information by final judgment or order of a court of competent jurisdiction, or unless the Client has expressly waived such confidentiality in advance in writing.
- g. Contractor shall not represent or purport to represent that it speaks for the Client vis-à-vis the media or the public at-large without the Client's express, written consent in advance.
- h. Prior to commencing services under this Agreement, Contractor shall furnish the Client, in writing, the names, addresses and telephone numbers of not fewer than two (2) principal employees of his business who are to be contacted in the event of an after-hours emergency.
- i. By entering into this Agreement, Contractor certifies under penalties of perjury that its entry was made and submitted in good faith and without collusion or fraud with any person. As used in this certification, the word "person" shall mean any natural person, business, partnership, corporation, union, committee, club, or other organization, entity, or group of individuals.
- j. By entering into this Agreement, Contractor certifies under the penalties of perjury, pursuant to M.G.L. c.62C, Section 49A(b), that it has complied with all laws of the Commonwealth relating to taxes, to reporting of employees and contractors, and to withholding and remitting child support.
- k. Prevailing wage rates, as contained in the Bid documents, shall be paid, pursuant to M.G.L. c.149, §§26-27G, if they are applicable.
- 1. Contractor understands that the Massachusetts Conflict of Interest Law, Chapter

268A of the Massachusetts General Laws, applies to Contractor with respect to the services required to be provided under this Agreement. Contractor and its officers, employees, agents, subcontractors and affiliated agencies shall not participate in any activity which constitutes a violation of the Massachusetts Conflict of Interest Law or which creates an appearance of a violation of the Massachusetts Conflict of Interest Law.

- Contractor shall not discriminate against or exclude any person from m. participation herein on grounds of race, color, religious creed, national origin, sex, gender identity, sexual orientation (which shall not include persons whose sexual orientation involves minor children as the sex object), age, genetic information, ancestry, children, marital status, veteran status or membership in the armed services, the receiving of public assistance, and handicap. The previous sentence shall include, but not be limited to, the following: advertising, recruitment; hiring; rates of pay or other forms of compensation; terms; conditions or privileges of employment; employment upgrading; transfer; demotion; layoff; and termination. Contractor shall take affirmative actions to insure that applicants are employed, and that employees are treated during their employment, without regard to race, color, religious creed, national origin, sex, gender identity, sexual orientation (which shall not include persons whose sexual orientation involves minor children as the sex object), age, genetic information, ancestry, children, marital status, veteran status or membership in the armed services, the receiving of public assistance, and handicap.
- n. To the extent that any of the foregoing sections required by Massachusetts law are inconsistent with other, non-statutory sections in this Agreement, any statutorily-mandated provisions contained herein shall control.
- o. Contractor shall not assign or subcontract in whole or in part this Agreement or in any way transfer any interest in this Agreement, other than the Subcontractors listed above, without the prior express written approval of the Client.
- p. This Agreement may be amended only by written consent of both parties.
- q. Contractor shall not assign any money due or to become due to Contractor unless the Client shall have received prior written notice of such assignment. No such assignment shall relieve Contractor of its obligations under this Agreement.
- r. If any provision, or portion thereof, of this Agreement shall be adjudged to be invalid or unenforceable by final judgment or order of a court of competent jurisdiction, the remaining provisions of the Agreement shall continue in effect to the extent permitted by law.
- s. The provisions of this Agreement shall be binding upon and inure to the benefit of the heirs, assigns and successors in interest of the parties.
- t. This Agreement shall be governed by and construed in accordance with the laws of the Commonwealth of Massachusetts, regardless of choice of law issues or

principles.

u. This Agreement is executed in triplicate as a sealed instrument.

(The remainder of this page is left intentionally blank.)

The Town of Natick, Massachusetts Hobart Energy Services, Inc. By: The Natick Board of Selectmen By: Amy K. Mistrot, Chair Signature Printed Name Susan G. Salamoff, Vice Chair Michael J. Hickey, Jr., Clerk Printed Title Jonathan Freedman Richard P. Jennett, Jr. Dated:

#### APPROVED AS TO AVAILABILITY OF APPROPRIATION:

In accordance with the requirements of M.G.L. Chapter 44, Section 31C, this is to certify that an appropriation in the amount of this Agreement is available therefor, and that the Natick Board of Selectmen is authorized to execute this Agreement and to approve all requisitions and execute change orders.

Arti P. Mehta Comptroller, Town of Natick

APPROVED AS TO FORM ONLY, AND NOT AS TO SUBSTANCE:

Karis North, Esq.

Dated:

Dated:

Dated:

\

#### CERTIFICATE OF VOTE

I,(Clerk/Secretary)			, hereby certify		
(Clerl	k/Secretary)				
that I am the duly	y qualified and acti	ng		of (Corporation	
Name)			(Title)	(Corporation	
	20, at which r	g of the Directors of s neeting all Directors v			
VOTED: To aut (Name)		er either		,	
(Name)	(Title)	· or			
(Name)	(Title)	, 01			
	(Title),				
any o	ne acting singly, to	execute all contracts	and bonds on behal	If of the Corporation.	
I, further certify		is still in effect on thi		*	
	Signature				
	Printed Nat	me			

Printed Title

The certification contained hereabove shall be executed by Contractor or copy of current "certification of authority to sign for the Corporation" shall be attached.)

#### **Exhibit A: Project Cost and Payment Terms**

<b>Company Name:</b>	Town of Natick
<b>Billing Address:</b>	13 East Central Street, Natick Town Hall, Natick, MA 01760

#### Purchase Order/Contract #:

\$54,024.00
N/A
\$54,024.00
\$1,690.00
\$1,690.00
\$52,334.00

#### Note:

#### **Project Payment Terms:**

Amount to be paid by the Client to Contractor	\$52,334.00
(Payable 30 days after invoice date))	,

Amount to be paid by Utilities to Contractor \$1,690.00 (Contractor will collect this amount directly from the Utilities)

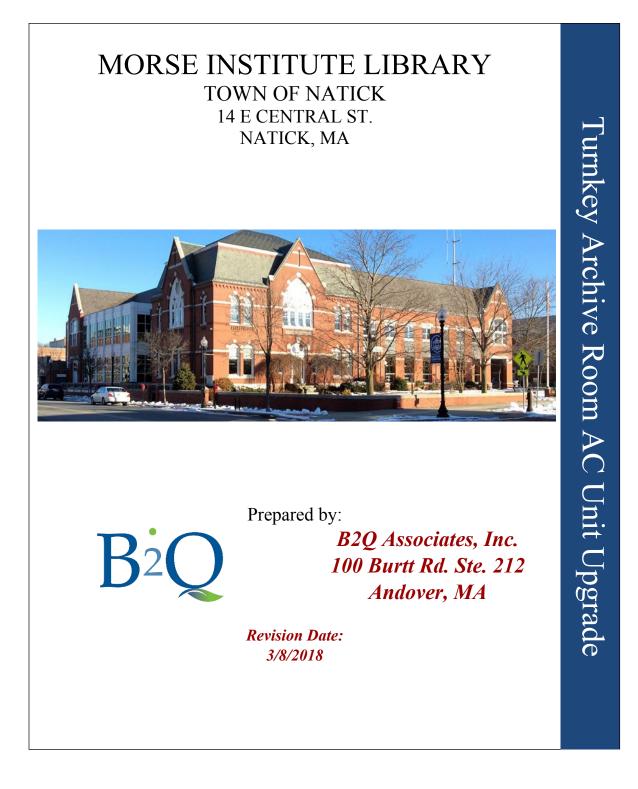
#### Total Project Cost \$54,024.00

#### **Schedule of Values:**

Mobilization Fee	\$15,000.00	Billed at Project Commencement for Purchase of Materials
Installation of Equipment	\$25,000.00	
Programming, Commissioning, and Closeout	\$7,100.60	Substantial Completion
Retainage	\$5,233.40	10%
Total Contract Amount	\$52,334.00	

The final invoice date will be determined by the "Certificate of Completion" as described in the Terms & Conditions.

Exhibit B: Project Proposal See next page.





B2Q Associates, Inc. 100 Burtt Rd. Suite 212 Andover, MA 01810 (978) 208 – 0609 www.b2qassociates.com

March 8, 2018

Ms. Jillian Wilson-Martin Sustainability Coordinator Town of Natick 75 West St. Natick, MA 01760

#### **RE:** Proposal for Turnkey Archive Room AC Upgrade in Morse Institute Library

Dear Jillian,

B2Q is pleased to provide you with this proposal to provide turnkey project services for an Archive Room Air Condition Unit upgrade project at the Morse Institute Library, located at 14 E Central St. in Natick, MA. B2Q originally identified this potential project in 2016 during our first energy audit of the facility. Subsequently, we were informed that the Town had been sub-metering the HVAC for the Archive Room through a project with the Peregrine Group, who also recommended the measure. After reviewing the information provided by Peregrine, discussing the project with Town Facilities staff, and speaking with document with preservation specialists, B2Q has developed a design that will likely extend the lifespan of the documents in the space compared to the existing AC unit by lowering the space temperature, while also saving significant energy. B2Q has surveyed the facility with the intent of developing projects for which the Town can submit requests for Green Communities Act grant funding. The Town has shown a commitment to energy savings in the Library with HVAC occupancy sensor and lighting retrofit projects happening in 2017. This project will further contribute to the cost saving and carbon reducing goals for this facility.

## **ECONOMICS SUMMARY**

The estimated economics for this project are given in the table below. B2Q has estimated the value of the utility incentive based on published prescriptive rebates from MassSave for mini split systems and the Green Communities Act grant may cover up to the remainder of the project cost after utility incentive. Please note that B2Q believes that this project may qualify for a custom utility incentive due to the special requirements of the space and the potential custom incentive could be larger than the prescriptive rebate from MassSave. The more conservative estimate is presented here in case the custom incentive request is denied, but if a larger incentive is obtained, B2Q will share the benefit with the Town by reducing our net price.

1	Archive Room AC Upgrade						
		%	Cost				
Utility	Savings Units	Savings	Savings				
Electricity	52,294 kWh	7.2%	\$	7,321	/yr		
Natural Gas	0 therms	0.0%	\$	-	/yr		
Total Energy	178 MMBtu	7.7%	\$	7,321	/yr		
Implementatio	on First Cost		\$	59,024			
Electric Utility	Incentive		\$	1,690			
Net Cost \$							
Simple Paybac			7.83	yr			

## **ENVIRONMENTAL IMPACT**

The proposed project would result in net emissions reductions for the Town of Natick. These results are summarized in the table below.

1	Archive Room AC Upgrade						
Equivalent Emissions Reductions							
Utility	Energy Savings	CO <sub>2</sub>	NO <sub>X</sub>	SOx	Gasoline	Trees	Homes
-		lb <sub>e</sub>	lb <sub>e</sub>	lb <sub>e</sub>	gal	-	-
Electricity	52,294 kWh	37,760	157	448	1,923	440	1.6
Natural Gas	0 therms	0	0	0	0	0	0.0
Total	178 MMBtu	37,760	157	448	1,923	440	1.6

## **PROJECT DESCRIPTION**

The scope of the project is the installation of a new ductless mini split heat pump system to serve the Archive Room in the basement of the Morse Institute Library. The approximately 400 ft<sup>2</sup> space houses important historical documents for the Town and as such, in order to maximize the lifespan of the documents, requires specific environmental conditions compared to the rest of the spaces in the building. The space is currently conditioned by a Liebert system that was originally intended for the computer equipment that had previously been used in that space. Our initial investigation suggests that the Liebert unit is oversized, poorly controlled, and near the end of its useful life. Submetering data from Peregrine shows that that Liebert system uses approximately 12 kW of electricity relatively consistently 24/7. This demand is noticeably higher than would be expected for this size system. B2Q investigated and found that the unit is consistently simultaneously in heating and cooling mode, such that the heating and cooling systems counteract each other and waste energy. Additionally, according to Town Facilities staff, the unit often requires service due to failing or malfunctioning components, which could be making the unit run more inefficiently.

In order to save energy and provide improved environmental control of this space, B2Q proposes to install a ductless mini-split system with ceiling-mounted cassettes for heating

and cooling. The current system design intent would be to maintain a dry bulb temperature between 60 °F and 65 °F in the winter when the load is low and as high as 70 °F on peak cooling days in the summer. B2Q participated in a conference call with representatives from the Image Permanence Institute (IPI) on Wednesday 2/28/18. On that call, the preservation experts suggested that lowering the space temperature as much as practically possible would extend the life of the documents. The proposed setpoints were agreed upon by the group as feasible and acceptable to meet the Town's preservation requirements. Note that B2Q is not recommending allowing the space temperature to fall below 60 °F because the Archive Room is surrounded by conditioned spaces on all sides and does not have insulated walls, meaning that there could be potential for condensation on the walls of the surrounding spaces if the Archive Room temperature fell too far. The Archive Room, as of the time of this proposal, is controlled to maintain a space temperature of 70 °F, so installing the new system with the lower setpoints would likely result in a longer lifespan of the documents, in addition to the energy savings.

Conversation with the IPI experts suggests that controlling relative humidity is also an important part of the preserving the documents' integrity. B2Q has surveyed the HVAC market and has not found any manufacturers who offer a product that can achieve both the Town's target temperature and humidity requirements in this size range (2 tons). Therefore, the scope of work and cost of this proposal is limited to a mini split system that will maintain the dry bulb temperature requirements in the winter and 70 °F in the summer, but will not necessarily maintain the humidity requirements. As part of a separate, follow up proposal, B2Q intends to research, design, and install a standalone dehumidification/humidification system to also serve the Archive Room.

B2Q intends to work with a licensed HVAC contractor to install the mini split system and associated components. For the purposes of this proposal, B2Q has obtained a budget quote from New England Ductless, a Mitsubishi dealer, but B2Q will put the project out to bid to at least one more contractor if/when the project is awarded to explore the possibility of further reducing the project cost to the Town. B2Q also intends to work with Trane, the building's controls contractor, to add new temperature and humidity sensors to the space, whose values could be read and trended through the building automation system graphics. This new information would allow Town and Library staff to verify that proper conditions are maintained and identify instances where conditions are not appropriate sooner so that action can be taken before damage is sustained by the documents.

The proposed structure of the project is that B2Q would deliver this project to the Town of Natick as a turnkey vendor. This means that the Town would only need to have one contract and write one purchase order for this project. B2Q would hire the mechanical and controls contractors as subcontractors and would pay them out of the single purchase order provided by the Town. In addition to hiring and managing the subcontractors, B2Q would provide the following services. See the Appendices for more information on our scope of work, including assumptions and exclusions.

- Energy savings analysis and calculations to a level of detail and accuracy that is typically required by Eversource and the Green Communities Act program administrators to secure funding.
- Eversource utility incentive applications.
- Green Communities Act grant applications.
- Contractor observation during construction.
- Commissioning of the newly-installed equipment after construction to verify proper operation
- Project management throughout construction, including construction schedule, building access, and coordination with the Town

## **SCHEDULE**

- B2Q and its subcontractors shall order equipment within (2) weeks of receiving a purchase order from the Town of Natick.
- Installation of the mini split system shall be complete within (2) weeks of equipment being delivered to the site.
- Commissioning and controls installation shall be complete within (2) weeks of completing the mini split system installation.

We thank you for the opportunity to provide you with this proposal and look forward to working with you on this project if selected.

Thank you,

## Joe Bliss

Joe Bliss, PE Project Manager B2Q Associates, Inc.

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## **APPENDICES**

## ASSUMPTIONS AND EXCLUSIONS

- 1. The above schedule and price are contingent upon B2Q and its subcontractors having consistent access to the facility. B2Q is not responsible for delays caused by restricted access to specific areas of the building and/or the building as a whole.
- 2. This proposal does not include any work associated with issues caused by hidden conditions or correction of existing code violations.
- 3. This proposal does not include demolition of the existing Liebert unit.

## **ENERGY CONSUMPTION ESTIMATES**

B2Q's energy cost savings estimates above are based on an average billing rate of \$0.14/kWh, as specific information from the Town was not available at the time of this proposal. If necessary, B2Q can update the above analysis based on updated information provided by the Town.

B2Q has no control of the actual building and equipment operation or over other variables which may affect energy consumption and/or associated costs or savings. Accordingly, B2Q does not expressly or implicitly warrant or represent that energy consumption savings and cost savings estimates of the building or equipment operation will be the actual operation energy and cost savings.

## **UTILITY INCENTIVES AND GREEN COMMUNITIES ACT GRANTS**

B2Q Associates has no control over the decisions of utility companies or state agencies to provide incentives or grants. Since incentives and grants are entirely at the discretion of the utility or state agency, B2Q does not expressly or implicitly warrant or represent that incentives will be awarded. However, B2Q will work within the framework of the existing programs to obtain available incentives for the Town of Natick in accordance with the rules and methods prescribed by Eversource and Commonwealth of Massachusetts. B2Q will prepare application forms on the Town's behalf and work with utility representatives and state agencies to help determine the funding levels to be provided. Eversource and the Commonwealth of Massachusetts conduct pre- and post-installation site inspections to verify existing equipment and to ensure that the installed equipment meets program specifications.

## CONTRACT TERMS

This proposal is valid for thirty days. All work is estimated to be done during normal daytime hours.

B2Q's aggregate, one-time liability to all claimants for any and all direct, incidental and consequential damages, both property and economic, arising in any way under this proposal, shall be limited to our fee. If this proposal is accepted by the Town, B2Q and

the Town of Natick would use an updated version of the contract that was used for the Library Occupancy Sensors project.

## **GENERAL FIRM DESCRIPTION**

B2Q provides energy engineering and turn-key energy efficiency project delivery, energy audits and screening studies, commissioning and retro-commissioning, technical training, project management, design, engineering, design reviews, troubleshooting, testing, measurement and verification, metering, building simulation, building automation, cogeneration, and utility demand side management program consulting.

## **KEY PERSONNEL**

Paul Banks, PE will be the principal in charge for this project. Mr. Banks will be responsible for the overall project staffing and quality reviews. Mr. Banks will review project deliverables prior to submission for quality assurance.

Joe Bliss, PE will be the Project Manager. Mr. Bliss will be responsible for project specifications, installation management, and quality control.

## ITEM TITLE: David Pratt: Interview for Appointment to the Economic Development Committee

## **ITEM SUMMARY:**

## ATTACHMENTS:

## Description

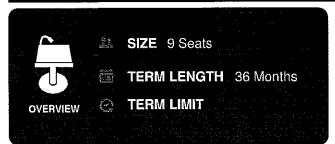
Committee Packet-Term Ending 6/30/2021

**Upload Date** 8/17/2018 **Type** Cover Memo



# Town of Natick ECONOMIC DEVELOPMENT COMMITTEE

#### **BOARD DETAILS**



The Economic Development Committee (EDC) is an advisory board, created by the Natick Board of Selectmen. The charge of the EDC is to:

- 1. Attract business development to Natick that will maximize tax revenue and generate employment opportunities;
- 2. Promote utilization of existing infrastructure and facilities to the fullest extent possible
- 3. Recognize neighborhood and community issues, concerns, and character
- 4. Identify and plan for changing trends and opportunities
- 5. Market Natick for economic development and strategic partnerships.



#### ENACTING RESOLUTION

ENACTING RESOLUTION WEBSITE



# Town of Natick ECONOMIC DEVELOPMENT COMMITTEE

#### **BOARD ROSTER**



DOUGLAS LANDRY 2004 Term Dec 16, 2013 - Jul 01, 2018



EDWARD J DOHERTY Istaterni Jul 12, 2016 - Jun 30, 2019



DAVID V. V SHAMOIAN Aller Jul 01, 2016 - Jul 01, 2019

E. SCOTT LAUGHLIN (1)1010000 Jul 01, 2017 - Jun 30, 2020



WILLIAM ALFANO 2001 Jul 01, 2017 - Jun 30, 2020

RICHARD P. JENNETT, JR.

Greatenn Jul 01, 2018 - Jun 30, 2021

VACANCY

JOSEPH ATTIA

Appointing Authority Board of Selectmen Position Member

Appointing Authority Board of Selectmen Position Member

Appointing Authority Board of Selectmen Position Member

Appointing Authority Board of Selectmen Position Chair

Appointing Authority Board of Selectmen Position Director of Community Development

Appointing Authority Board of Selectmen Position Member

Appointing Authority Board of Selectmen Position Board of Selectmen Representative

Appointing Authority Board of Selectmen Position Member

Profile				
David	C P	ratt		
First Name		st Name		,
david@sherwoodplaza.com				
Email Address				
HC Atlantic Development LP			393 Totten	Pond Rd Ste 203
Street Address			Suite or Apt	
Waltham			МА	02451
City			State	Postal Code
What district do you live in? '				
☑ N/A				
X.				
Mobile: (617) 775-9735	Business: (78	1) 890-1380		
Primary Phone	Alternate Phone			
HC Atlantic Development LP	<u>VP</u>			
Employer	Job Title			
Which Boards would you like	to apply for?			•
Economic Development Committe	ee: Submitted			
Are you a registered voter in	the Town of Nat	ick?		
		· · · · ·		
o Yes o No				
Have you ever attended a Nat	ick town meetin	g?		
O Yes O No				
Have you ever served on a bo	oard, committee,	or commissior	ı in the Town of	Natick?
⊙ Yes ⊙ No				

•

## David Cohen Pratt

#### 7/1/2018



56 Yarmouth Road Wellesley, MA 02481 617-775-9735 (c) dcohenpratt@gmail.com

#### EDUCATION

Tufts University, Medford, MA 1980 - 1984, Bachelor of Arts, Economics

#### EXPERIENCE

## Vice President, HC Atlantic Development LP / Harold Cohen Associates Inc. 2013 - Present

Real estate management & real estate development specializing in commercial and shopping centers. Managed re-development of multiple parcels valued at over \$20mm.

#### Sr. Consultant, supplyFORCE LLC

2013 - 2016

Assist with post-merger business integration, support IT systems, develop integration tools and data conversion programs to integrate 150MM business transaction migration.

#### CIO & Co-Founder, Vanguard National Alliance Inc.

2007 - 2013

Responsible for managing all aspects of IT, systems, support, ecommerce and business process design for \$100-150mm ecommerce collaborative business.

#### CEO & Co-Founder, Vanguard National Alliance Inc.

2001 - 2007

Co-Founder and original CEO for collaboration of 40 electrical distribution companies from across the United States and Canada.

#### President/CEO, PM Systems Inc.

1984 - 2001 ERP software company with 10 employees and clients across the US and Canada.

#### SKILLS & INTERESTS

Peking and the Mystics

2003 – Present

A cappella singing group of five men from greater Boston (and all former members of Tufts' Beelzebubs), actively performing regionally, nationally and internationally. Recorded four CDs and produced the latest two. Group's repertoire, comprised of original arrangements by PATM members, features jazz, swing, doo-wop, "Motown" and pop music of every decade from 1900s to 2000s.

Enjoy coaching youth soccer, cooking, hiking and home repair projects

## ITEM TITLE: Sign October 16, 2018 Fall Town Meeting Warrant ITEM SUMMARY:

ATTACHMENTS: Description

Warrant

**Upload Date** 8/20/2018 **Type** Cover Memo

#### WARRANT FALL ANNUAL TOWN MEETING OCTOBER 16, 2018

#### THE COMMONWEATH OF THE MASSACHUSETTS

#### Middlesex, ss

#### To Any Constable of the Town of Natick in said County: Greeting:

In the name of the Commonwealth of Massachusetts you are required to notify the qualified Town Meeting Members of the said Town of Natick to meet in the Natick High School, Natick on **Tuesday Evening October 16, 2018 at 7:30 PM**, then and there to act on the following Articles:

- Article 1 Fiscal 2019 Omnibus Budget
- Article 2 Stabilization Fund
- Article 3 Operational/Rainy Day Stabilization Fund
- Article 4 Capital Stabilization Fund
- Article 5 Other Post-Employment Benefits (OPEB) Appropriation or Transfer of Funds
- Article 6 Appropriate Funds for the Family of Michael McDaniel Jr.
- Article 7 Transfer of Unexpended Bond Proceeds
- Article 8 Collective Bargaining
- Article 9 Personnel Board Classification and Pay Plan
- Article 10 Committee Article
- Article 11 Rescind Authorized, Unissued Debt
- Article 12 Unpaid Bills
- Article 13 Capital Equipment
- Article 14 Capital Improvement
- Article 15 West Natick Fire Station Appropriation of Funding
- Article 16 West Natick Fire Station Land Acquisition
- Article 17 Change Authority for Acquisition of 22 Pleasant Street Among Other Items
- Article 18 Appropriate Funds for the Design and Development of Route 27 North Main Street
- Article 19 Capital Equipment
- Article 20 Legal Settlement
- Article 21 Excise Tax on Retail Sales of Marijuana for Adult Use
- Article 22 Marijuana Establishments Zoning Bylaw Amendment
- Article 23 Amend Zoning By-Law to create, extend, and/or modify the existing Temporary Moratorium Regarding Recreational Marijuana Establishments currently located in Section III-K: Marijuana Establishments of the Natick Zoning Bylaws
- Article 24 Amend Town of Natick By-law Article 10: Board of Selectmen
- Article 25 Amend Agreement with the South Middlesex Regional Vocational School District
- Article 26 Supplement Prior Town Meeting Vote Authorizing Acquisition and Preservation of the Sawin House and Adjacent Property at 79 South Street, Assessors Map 77 Lot 7
- Article 27 Prohibit Dog Kennels in Single Family Residential Zones RS and/or RG
- Article 28 Amend Zoning By-Law to Allow Indoor Amusement or Recreational Uses in Industrial Zoning Districts by Special Permit
- Article 29 Amend Article 2 of the Town of Natick Home Rule Charter
- Article 30 Amend Town of Natick Zoning Map: Assisted Living Overlay Option Plan
- Article 31 Actions Pertaining to Acquisition and Preservation of the Town's easements on Mechanic Street
- Article 32 Amend Natick Zoning By-Laws: Inclusionary Affordable Housing Requirements
- Article 33 Establish Study Committee: 1.5% Test of Land Use
- Article 34 Amend Historic Preservation Zoning By-Law
- Article 35 Voting Requires Being Legal Resident of Massachusetts and this Municipality
- Article 36 Amend Zoning By-Laws: Outdoor Lighting
- Article 37 Amend Zoning By-Laws: Signage (Residential Zoning Districts)

- Article 38 Amend Natick Town Charter; Natick Town By-Laws; Natick Zoning By-Laws: Constitution of zoning board of appeals, division and distribution of powers regarding MGL c. 40B sections 20-23
- Article 39 Amend Natick Town Charter: Natick By-laws, Natick Zoning By-laws: Appointment and constitution of zoning board of appeals, division and distribution of powers, and assignment of counsel.
- Article 40 Amend the Town of Natick By-Laws: Create New Committee
- Article 41 Snow Removal ByLaw
- Article 42 Technical Changes to Charter and By-Laws



#### ARTICLE 1 Fiscal 2019 Omnibus Budget (Town Administrator)

To see what sum of money the Town will vote to raise and appropriate, transfer from available funds or otherwise provide for the operation of the government of the Town of Natick, including debt and interest, during Fiscal Year 2019 (July 1, 2018 through June 30, 2019) and to provide for a reserve fund for Fiscal Year 2019, and to see what budgets for Fiscal 2019 will be reduced to offset said additional appropriations; or otherwise act thereon.

#### ARTICLE 2 Stabilization Fund (Town Administrator)

To see what sum of money the Town will vote to raise and appropriate, transfer from available funds or otherwise provide for the purpose of supplementing the Stabilization Fund established under Article 22 of the warrant for Annual Town Meeting of 1961, as authorized by Chapter 40, Section 5B of the General Laws, as amended; or otherwise act thereon.

#### ARTICLE 3 Operational/Rainy Day Stabilization Fund (Town Administrator)

To see what sum of money the Town will vote to raise and appropriate, transfer from available funds or otherwise provide for the purpose of supplementing the Operational Stabilization Fund established by vote of the 2011 Spring Annual Town Meeting under Article 4, as authorized by Chapter 40, Section 5B of the General Laws, as amended; or otherwise act thereon.

#### ARTICLE 4 Capital Stabilization Fund (Town Administrator)

To see what sum of money the Town will vote to raise and appropriate, transfer from available funds or otherwise provide for the purpose of supplementing the Capital Stabilization Fund established under Article 2 of the warrant for Fall Annual Town Meeting of 2010, as authorized by Chapter 40, Section 5B of the General Laws, as amended; or otherwise act thereon.

#### ARTICLE 5 Other Post-Employment Benefits (OPEB) Appropriation or Transfer of Funds (Town Administrator)

To see what sum of money the Town will vote to raise and appropriate, transfer from available funds or otherwise provide for, the Other Post-Employment Benefits Liability Trust Fund established pursuant to the provisions of Chapter 32B, Section 20 of the General Laws as amended by section 15 of Chapter 218 of the Acts of 2016; or otherwise act thereon.

#### ARTICLE 6 Appropriate Funds for the Family of Michael McDaniel Jr. (Town Administrator)

To see if the Town will vote to appropriate funds to supplement the prior appropriations given to the widow of Michael McDaniel Jr., long time employee of the Town of Natick Department of Public Works, killed in the line of duty on February 4, 2014; or otherwise act thereon.

#### ARTICLE 7 Transfer of Unexpended Bond Proceeds (Town Administrator)

To see if the Town will authorize the transfer of unexpended proceeds from amounts previously borrowed to pay costs of various capital projects, which projects are now complete, and for which such funds are no longer needed, to pay costs of one or more capital projects; or take any other action relative thereto.

#### ARTICLE 8 Collective Bargaining (Board of Selectmen)

To see what sum of money the Town will vote to raise and appropriate, transfer from available funds, or otherwise provide, to implement any Collective Bargaining Agreements between the Town Natick and any recognized bargaining units of the Town; or otherwise act thereon.

#### ARTICLE 9 Personnel Board Classification and Pay Plan (Town Administrator)

To see if the Town, pursuant to the authority contained in Section 108A of Chapter 41 of the General Laws, will vote to amend Article 24 of the Natick Town By-Laws, specifically the Classification and Pay Plan referenced in Section 3, paragraph 3.10 therein, by adding, deleting or amending position titles; re-classifying positions to a different Grade; and/or effecting changes in the salary ranges as presently established; or otherwise act thereon.

#### ARTICLE 10 Committee Article (Board of Selectmen)

To see if the Town will vote to hear and discuss the reports of town officers, boards, and committees; or otherwise act thereon.

#### ARTICLE 11 Rescind Authorized, Unissued Debt (Town Administrator)

To see if the Town will vote to rescind the authorization for unissued debt that has been determined is no longer needed for the completion of various projects; or otherwise act thereon.

#### ARTICLE 12 Unpaid Bills (Town Administrator)

To see what sum of money the Town will vote to raise and appropriate, transfer from available funds, or otherwise provide for the payment of unpaid bills of previous years, incurred by the departments, boards and officers of the Town of Natick; or otherwise act thereon.

#### ARTICLE 13 Capital Equipment (Town Administrator)

To see what sum of money the Town will vote to raise and appropriate, borrow, transfer from available funds or otherwise provide as may be required for capital equipment for the various departments of the Town of Natick; to determine whether this appropriation shall be raised by borrowing or otherwise; or otherwise act thereon.

#### ARTICLE 14 Capital Improvement (Town Administrator)

To see what sum of money the Town will vote to raise and appropriate, borrow, transfer from available funds or otherwise provide to implement a Capital Improvement Program, to protect the physical infrastructure of the Town of Natick, to add new physical infrastructure, or to improve community assets; and, further, to determine whether this appropriation shall be raised by borrowing or otherwise; or to otherwise act thereon.

#### ARTICLE 15 West Natick Fire Station Appropriation of Funding (Board of Selectmen)

To see what sum of money the Town will vote to appropriate, borrow, transfer from available funds or otherwise provide to be expended under the direction of the Board of Selectmen to design, develop, construct, furnish, and equip a new West Natick Fire Station (Fire Station #4), currently located at 268 Speen Street, Natick, Massachusetts, 01760, including all related facilities, buildings, appurtenant structures, site improvements, and grounds; or otherwise act thereon.

#### ARTICLE 16 West Natick Fire Station Land Acquisition (Board of Selectmen)

To see if the Town will vote to authorize the Board of Selectmen to acquire by gift, purchase, eminent domain or otherwise, land needed for the construction of the West Natick Fire Station which land is located on the southerly side of Worcester Street, Route 9, and is shown on a plan a copy of which is on file in the Community Development Office; and further, to see what sum of money the Town will vote to raise and appropriate, borrow, transfer from available funds or otherwise provide for the purposes of this article; or otherwise act thereon.

#### ARTICLE 17 Change Authority for Acquisition of 22 Pleasant Street Among Other Items (Robert Awkward et al)

To see what action(s) the Town will take, under MGL Chapter 45 Section 14, or any other authority, either a) to create a committee appointed by the Moderator or b) to use one of the methods specified in MGL Chapter 45, including, without limitation, section 14 of MGL Chapter 45, and/or c) to authorize the Conservation Commission under MGL Chapter 40 including, without limitation, section 8 – c to negotiate for and to acquire the property known as 22 Pleasant Street, alternatively know as Map 64 Parcel 44, in Natick for park and playground purposes and/or conservation and/or passive recreation purposes as the case may be including without limitation:

- a) to create such committee appointed by the Moderator as an action of Town Meeting and/or to amend the Town ByLaws to create and to empower such committee or commission and specify their powers and duties and or b) to create within the scope of MGL Ch 45 including, without limitation, section 14 a committee or commission and to provide for their appointment by elected officers or elected multiple member bodies, and c) to allow any committee or commission access to the services of Town counsel and town staff; and/or
- 2) to set the number, qualifications and terms of members of such committee or commission; and/or
- 3) to change the previous votes of town Meeting under Article 35 of Spring 2015 Annual Town Meeting, Article 29 of Spring 2016 Town Meeting, or any other previous warrant article and vote of Town Meeting in order, without limitation, to change the authority to negotiate from the Board of Selectmen to such new committee or commission or to elected parks commissioners or the Conservation Commission, to transfer the control over and the authority to expend funds under any and all existing appropriation authority from the Board of Selectmen to such committee of commission or the Conservation, provided, however, that neither any existing appropriation nor any existing borrowing authorization nor the eminent domain authorization nor grant application nor grant application authorizations may be rescinded or reduced in any way under this warrant article; and/or
- 4) to see what additional sums of money the town may raise, transfer from available funds, appropriate and or authorize or raise from borrowing to accomplish the purposes of the acquisition of 22 Pleasant St. and /or to authorize acquisition of the fee interest in the property, a long term renewable ground lease whether rent paid over time of all up front in lump sum or an exclusive perpetual easement for the use of 22 Pleasant St. ; and/or
- 5) to change the condition or conditions of any of the previous votes of Town Meeting referenced in 3) above in order to change the purpose of those previous appropriations and votes to be consistent with this article, to remove the conditions in any of those previous

votes concerning letters of intent or any other matters, and/or to modify such conditions consistent with accomplishing the purposes of this article; and/or

6) to provide that whatever new committee of commission or the Conservation Commission is authorized under this article will also have access to Town Counsel and Town staff for the purposes of negotiating for and acquiring 22 Pleasant St.; and/or

or otherwise act thereon.

#### ARTICLE 18

#### Appropriate Funds for the Design and Development of Route 27 North Main Street (Board of Selectmen)

To see what sum of money the Town will vote to raise and appropriate, borrow, transfer from available funds or otherwise provide for design and development of the Route 27 North Main Street (Route 27) roadway improvement project, including but not limited to design, right of way (design and/or acquisition), legal, appraisal, permitting, and/or construction phase services; or otherwise act thereon.

#### ARTICLE 19 Capital Equipment (Interim School Superintendent)

To see if the Town will vote to appropriate and raise, borrow or otherwise provide, a sum of money as may be required for capital equipment for the various departments of the Town of Natick; to determine whether this appropriation shall be raised by borrowing or otherwise; or otherwise act thereon.

Emergency Generator – Memorial Elementary School - \$25,000 Natick High School Athletic Field Bleacher Repairs - \$20,000 ADA Accessibility Wheelchair Ramp – Auditorium – Johnson Elementary School - \$10,000

*Total* = \$55,000

#### ARTICLE 20 Legal Settlement (Interim School Superintendent)

To see if the Town will vote to raise and appropriate, or otherwise provide, the funds necessary to implement the Terms of a Legal Settlement Agreement/litigation outcomes between the Natick Public Schools and pending litigation regarding cases currently before the Massachusetts Court System/Massachusetts Arbitration System.

## ARTICLE 21 Excise Tax on Retail Sales of Marijuana for Adult Use (Board of Selectmen)

To see if the Town of Natick will vote to accept Massachusetts General Laws Chapter 64N, Section 3 to impose local sales tax upon sale or transfer of marijuana or marijuana products by a marijuana retailer operating within the Town of Natick, to anyone other than a marijuana establishment, at a rate not greater than 3 per cent of the total sales price received by the marijuana retailer, or to otherwise act thereon.

### ARTICLE 22 Marijuana Establishments Zoning Bylaw Amendment (Planning Board)

To see if the Town will vote to amend the Town of Natick Zoning By-Laws and Map with regards to establishing reasonable regulations regarding the time, place and/or manner of adult use marijuana establishments per G.L. c. 94G, including but not limited to the following:

- Replace and/or modify the existing "Section III-K: Marijuana Establishments" with a new "Section III-K: Adult Use Marijuana Establishments" which address the following topics:
  - Specify the purpose, scope, and/or objective;
  - Specify the applicability of the provisions;
  - Specify the relationship with underlying districts and regulations;
  - Create, amend, and/or add definitions;
  - Specify the place, time and/or manner;
  - Create and/or specify the regulation of the use(s), including but not limited to any special provisions and/or limitation of the use(s) such as creating a use regulation table, establishing buffer zones, relationship to existing uses, location to other similar establishments, and/or other special provision regarding where such uses can be located or operated;
  - Create and/or specify the special Permit and/or site plan requirements and/or process;
  - Create and/or specify provisions, if any, for licensing requirements, community outreach, community host agreement, energy use, parking and traffic impacts, waiver provisions, enforcement, inspections, screening and/or other visual impacts, signage, and/or other neighborhood and abutter protections; and/or
- Amend and/or modify the Town of Natick Zoning Bylaw to create one or more Adult Use Marijuana Establishment overlay zoning district(s) in Section II – Use Districts, II-A Types of Districts; and/or
- Amend the Town of Natick zoning map, as referenced under Section II-B Location of Districts (Zones) subsection 1 to locate one or more Adult Use Marijuana Establishment overlay zoning district(s) on parcels with current underlying zoning allowing commercial, retail, and/or industrial uses either by right or by special permit;
- And/or extend and/or modify an existing temporary moratorium regarding recreational marijuana establishments and related uses currently located in Section III-K: Marijuana Establishments of the Town of Natick Zoning Bylaws. The existing moratorium is in effect through December 31, 2018 or six (6) months from the date of adoption of regulations to implement the Acts by the Cannabis Control Commission, whichever is later. The proposed extension and/or modification of the existing moratorium shall be in effect for a period up to, but not exceeding, an additional six (6) months from December 31, 2018, unless said moratorium is extended, modified or rescinded by a subsequent action of Town Meeting;

or otherwise act thereon.

#### ARTICLE 23

## Amend Zoning By-Law to create, extend, and/or modify the existing Temporary Moratorium Regarding Recreational Marijuana Establishments currently located in Section III-K: Marijuana Establishments of the Natick Zoning Bylaws (Town Administrator)

To see if the Town will vote to amend the Natick Zoning By-Law pursuant to Chapter 334 of the Acts of 2016, subsequently amended, in part, by Chapter 351 of the Acts of 2016, entitled "An Act Further Regulating the Cultivation of Marijuana and Marihuana," and by Chapter 55 of the Acts of 2017, entitled "An Act to Ensure Safe Access to Marijuana" (collectively, the "Acts") by creating, extending and/or modifying an existing temporary moratorium regarding recreational marijuana establishments and related uses currently located in Section III-K: Marijuana Establishments of the Natick Zoning Bylaws. The existing moratorium is in effect through December 31, 2018 or six (6) months from the date of adoption of regulations to implement the Acts by the Cannabis Control Commission, whichever is later. The proposed extension and/or modification of the existing moratorium shall be in effect for a period up to, but not exceeding,

an additional six (6) months from December 31, 2018, unless said moratorium is extended, modified or rescinded by a subsequent action of Town Meeting; the purpose of said moratorium extension is to allow the Town of Natick adequate time to consider whether and/or how to allow, prohibit and/or regulate marijuana establishments and related uses as outlined in the Acts, in accordance with applicable state laws and regulations, and to undertake an appropriate planning process; or otherwise act thereon.

## **ARTICLE 24**

#### Amend Town of Natick By-law Article 10: Board of Selectmen (Board of Selectmen)

To see whether the Town will vote to amend the Town of Natick By-Laws, Article 10, Board of Selectmen by adding a new Section 5: Marijuana Licensing, the purpose of which shall be to create a local licensing process for Marijuana Establishments pursuant to G.L. c.94G Section 3 and 935 CMR 500, under the authority of the Board of Selectmen, to include provisions for regulations, hearings, applications, enforcement, limitation on licenses, and/or other requirements that may be adopted by the Board of Selectmen under such licensing authority; or otherwise act thereon.

#### ARTICLE 25

#### Amend Agreement with the South Middlesex Regional Vocational School District (Board of Selectmen)

To see if the Town will vote to amend the agreement among the towns of Ashland, Holliston, Hopkinton and Natick and the City of Framingham with respect to Establishment of a Regional Vocational School District to incorporate prior amendments to said agreement, to eliminate outdated provisions, to recognize Framingham's change from a town to a city form of government, and to bring said agreement into alignment with the District's existing practices, in accordance with an April 23, 2018 executive summary, a copy of which is on file with the office of the Town Administrator; or otherwise act thereon.

#### **ARTICLE 26**

#### Supplement Prior Town Meeting Vote authorizing Acquisition and Preservation of the Sawin House and Adjacent Property at 79 South Street, Assessors Map 77 Lot 7. (Board of Selectmen)

To see if the Town will vote, supplementing the vote of the 2017 Fall Annual Town Meeting under Article 28, to authorize the Board of Selectmen to acquire easements over adjoining property, including without limitation property owned by the Massachusetts Audubon Society, Inc., for purposes to use of the former Sawin House Property at 79 South Street, Natick, shown on Town Assessor's Map 77, Lot 7, including vehicular and pedestrian access and egress, use of a septic system, vehicle parking, maintenance or removal of trees, and drawing water from a well; or otherwise act thereon.

#### ARTICLE 27 Prohibit Dog Kennels in Single Family Residential Zones RS and/or RG (George Richards et al)

To see if the town will vote to:

- 1. Prohibit dog kennels in single family residential zones RS and/or RG.
- 2. Change Natick by-laws section III-A-2 Use Regulations, <u>Other Uses</u>, item 53 where a Dog Kennel may be allowed by special permit to reflect the prohibition of Dog Kennels in the RS and/or RG zones; i.e. replace "A" with an "O"

or take any other action with respect thereto.

#### ARTICLE 28

## Amend Zoning By-Law to allow Indoor Amusement or Recreational Uses in Industrial Zoning Districts by Special Permit (George Richards et al)

To see what action(s) the town will take to amend the Zoning By Law to allow Indoor Amusement or Recreational Uses (Use # 12 in Section III-A.2 of the Zoning By-Law) by special permit in some or all of the existing Industrial zoning districts, including but not limited to the following:

- 1) Whether to limit Use #12 by special permit to Industrial I and II zoning districts or only allow the use by special permit only in Industrial I zoning districts and/or
- 2) Whether to allow Use #12 by special permit to only one specific Industrial I zoned area, namely in the so-called "East Natick Industrial Park" on the east side of Oak Street, specifically including the following parcels (and including any further subdivision of these parcels) as identified on the Town's Assessors Maps: Map 8, Lots 41A, 41B, 41C, 41E, 41G, 41H, 41FA, 41FB, 41FBB, 42, 42A, 42B, 42C, 42D, 42E, 42F and 43; Map 9, Lots 2A, 2B, 2C, 2D, 2E, 2EA, 2F, 2G, 2J, 2K, 2L, 2M, 2N, 28, 28A and 28B; Map 14, Lots 76, 76A, 77A and 77B; and Map 15, Lots 105A, 105B and 105C, whether by limiting the floor area ratio of the recreational use, by way of creating a new Industrial zone, creating an overlay district, by footnote in the Use Regulation Schedule, and/or allowing the use elsewhere in the Zoning By-Law

or otherwise act thereon.

#### ARTICLE 29 Amend Article 2 of the Town of Natick Home Rule Charter (Board of Selectmen)

To see if the Town will vote to amend Article 2 of the Town of Natick Home Rule Charter as follows:

In Section 2-11 (b) delete item (3) which reads "any ten voters" and insert in its place "(3) any ten or more registered voters of the town for any annual town meeting and any one hundred or more registered voters for any special town meeting in accordance with Massachusetts General Laws Chapter 39, Section 10," so that the section shall read:

"(b) Initiation of Articles - The Board of Selectmen shall receive all petitions which are addressed to it and which request the submission of particular subject matter to the representative town meeting and which are filed by: (1) any elected town officer, (2) any multiple member body, acting by a majority of its members, (3) any ten or more registered voters of the town for any annual town meeting and any one hundred or more registered voters of the town for any special town meeting as detailed in Massachusetts General Laws Chapter 39, Section 10, (4) such other persons or agencies as may be authorized by law, or by by-law. All such requests for submission of matters shall be in writing, but they shall not be required to conform to any particular style or form. The board of selectmen shall within fourteen days of receipt of a proposed zoning by-law amendment submit the same to the planning board for review."

or otherwise act thereon

#### ARTICLE 30 Amend Town of Natick Zoning Map: Assisted Living Overlay Option Plan (David Presutti et al)

To see if the town will vote to amend the Town of Natick Zoning Map as follows: By including an "Assisted Living Overlay Option Plan" overlay district on the land known as 89 Union Street, also known as Assessors parcel: Map 53, Parcel 32

Or take any other action relative thereto.

#### ARTICLE 31 Actions Pertaining to Acquisition and Preservation of the Town's Easements on Mechanic Street (Board of Selectmen)

To see if the Town will vote to authorize the Board of Selectmen to acquire by gift, purchase, eminent domain or otherwise, any interest, whether by easements or otherwise, in all or part of Mechanic Street for any of the following: roads, sidewalks, vehicular and/or pedestrian access or passage, drainage and utilities or other purposes that Town Meeting may authorize, and, further, to authorize the Board of Selectmen to acquire, by easements or otherwise, interests in any of the parcels which abut Mechanic Street for the purposes of this article; and further, to see what sum of money the Town will vote to raise and appropriate, borrow, transfer from available funds or otherwise provide for the purposes of this article; or otherwise act thereon.

### ARTICLE 32 Amend Natick Zoning By-Laws: Inclusionary Affordable Housing Requirements (Planning Board)

To see if the Town will vote to amend the Natick Zoning Bylaws with regard to promoting Affordability in the town's housing stock and enabling and permitting the construction or development of Affordable Housing, as provided for in MGL c. 40B and defined in 760 CMR 56, by:

- Amend, modify, or add to Section 200 Definitions, including without limitation defining any aspect of the provision(s) of affordable housing, affordable housing requirements, and/or provisions for housing that meets the Commonwealth's standards for inclusion on the Town's Subsidized Housing Inventory (SHI) (as defined in 760 CMR 56); and
- Replace, eliminate, or modify the following sections (including without limitations subsections and/or footnotes) within the Natick Zoning Bylaw that relate to minimum affordable housing requirements, affordability requirements, affordable housing provisions, and/or other affordable provisions/requirements (whether local or related to the Commonwealth's requirements for inclusion in the Subsidized Housing Inventory):
  - Section III-A.2 Use Regulations Schedule
  - Section III-A.6.A Inclusionary Housing Option Program (IHOP)
  - Section III-A.6.B Housing Overlay Option Plan (HOOP)
  - Section III-D Use Regulations for LC Districts
  - Section III.E Downtown Mixed Use District
  - Section III-F Cluster Development Allowed in Certain Districts:
    - 1.F Town House Cluster Development
    - 2.F Single-Family Town House Cluster Development
    - 3.F Single-family Town House Cluster Development (RSC District)
    - 4.F Cluster Development AP and PCD Districts
    - 5.F Comprehensive Cluster Development Option
  - Section III-I.1 Assisted Living Residences
  - Section III-I.2 Independent Senior Living Overlay Option Plan (ISLOOP)
  - Section III-J Historic Preservation
  - Section 320 Highway Overlay Districts

with a new Section V-J – Inclusionary Affordable Housing Requirements, which address the following topics:

• Purpose and Intent to encourage the development of affordable housing

- Applicability of mandatory provisions of affordable units
- Affordable housing unit requirements (on site and off site)
- Special permit requirements
- Fees-in-lieu of affordable unit requirements
- Density Bonus
- Maximum income and sell price provisions
- Preservation of affordability and restrictions on resale of units;

or otherwise act thereon.

## ARTICLE 33 Establish Study Committee: 1.5% Test of Land Use (Julian Munnich et al)

To see whether the Town will vote to establish a study committee of Town Meeting, appointed by the Moderator, to address, research, study, analyze and recommend regarding the issue and question of where the Town stands relative to and whether the Town has met and/or can meet its obligation under the so-called "1.5% test" of land use as defined and more specifically described in MGL c.40B §§ 20-23, 760 CMR 56 and/or related guidelines issued by DHCD or any office of the Commonwealth or established in any legal proceeding; and, without limitation:

- 1) To establish the number and/or qualifications of committee members to be appointed;
- 2) To establish the charge of said committee including, but not limited to:
  - Identify any and all components of the calculation and all individual parcels or acreage owned by the United States; the Commonwealth; or any political subdivision thereof; the Department of Conservation and Recreation or any state public authority; or where all residential, commercial, and industrial development has been prohibited by deed, decree, zoning or restrictive order of the Department of Environmental Protection pursuant to M.G.L. c. 131, § 40A; or is dedicated to conservation or open space whether under control or ownership by trusts, corporations, partnerships, private parties, or elsewise; or is contained in the Subsidized Housing Inventory; and the size of all bodies of water located within Natick;
  - Gather any other information necessary to analyze, evaluate, and calculate the Town's position relative to the 1.5% test;
  - Identify and recommend any zoning changes or other actions that might strengthen or improve the Town's position relative to meeting or exceeding this test;
  - Report its findings and recommendations to 2019 Fall Annual Town Meeting or such other date as Town Meeting shall establish provided, however, that this shall not preclude any preliminary or earlier report(s) to Town boards, committees, commissions, or to Town Meeting;
- 3) To authorize said committee to develop a database of properties to be included in and/or excluded from either the numerator or the denominator of the calculation;
- 4) To provide that said committee shall have access to Town Counsel and to Town staff, including but not limited to the Community and Economic Development, DPW (GIS), and Finance (Assessors) divisions and may utilize the services of outside consultants;
- 5) To provide for a method to engage any such outside consultant including, without limitation, a reserve fund transfer by the Finance Committee;

- 6) To see what sum of money the Town will appropriate to accomplish the purpose of said committee;
- 7) To set the term of said study committee to expire upon the dissolution of 2019 Fall Annual Town Meeting or such other date as Town Meeting shall establish unless otherwise extended by Town Meeting;
- 8) Said committee, being a multiple member body under the Town Charter, is authorized to sponsor warrant articles for any Annual or Special Town Meeting Warrant;

or otherwise act thereon.

### ARTICLE 34 Amend Historic Preservation Zoning By-Law (Joel Valentin et al)

To see what action(s) the town will take to amend the Historic Preservation By Law (Section III-J) so as to increase the amount of new construction allowed on a parcel whether based on the size of the parcel, excessive compliance of the structure and/or lot with underlying zoning requirements, restoration of the structure to its' original state and/or other regulatory requirements,

Or otherwise act thereon.

## ARTICLE 35 Voting Requires Being Legal Resident of Massachusetts and this Municipality (Tony Lista et al)

To see if the Town will vote to:

Amend its charter (section 7-7 sub section (I)) and bylaws, (article 1 town election and town meeting) by inserting the following language: "A person over the age of 18 shall be qualified to vote in municipal elections who is a United States citizen and a legal resident of Massachusetts and this municipality, and who meets the qualification of M.G.L. Ch. 51, section 1

or otherwise act thereon.

#### ARTICLE 36 Amend Zoning By-Laws: Outdoor Lighting (Planning Board)

To see if the Town will vote to amend the Town of Natick Zoning Bylaws by modifying Section V-I (Outdoor Lighting) and Section 200 (Definitions) to provide regulation of pole-mounted lighting.

Or otherwise act thereon.

#### ARTICLE 37 Amend Zoning By-Laws: Signage (Residential Zoning Districts) (Planning Board)

To see if the Town will vote to amend the Town of Natick Zoning Bylaws by modifying Section V-H (Signs and Advertising Devices) and Section 200 (Definitions) to provide regulation of signage in Residential Zoning Districts for uses that are permitted as of right, by special permit, by variance, by pre-existing use, or uses exempted in MGL Chapter 40A, Section 3 from certain zoning restrictions.

Or otherwise act thereon.

#### ARTICLE 38

Amend Natick Town Charter; Natick Town By-Laws; Natick Zoning By-Laws: Constitution of zoning board of appeals, division and distribution of powers regarding MGL c. 40B sections 20-23 (Julian Munnich et al) To see if the Town will vote to amend the Town of Natick Home Rule Charter, the Natick Town By-Laws, and the Town of Natick Zoning By-Laws to, including but not limited to adding new sections and/or definitions, and/or amending existing sections and/or definitions; to provide for the division and exercise of functions to other appointed or elected bodies:

-Pursuant to MGL c. 40A s.12, MGL c. 4 s. 7, MGL c. 43B s. 20, and MGL c. 40B s. 21 or otherwise; provide by amendment and/or addition including but not limited to the Article 3 Section 11 b of the charter to make the Planning Board responsible for hearing comprehensive permit applications under MGL Chapter 40 b s 20-23; divide the assignment of functions to other appointed or elected bodies;

-Pursuant to MGL c. 40 s. 32 or otherwise; provide by amendment and/or addition to the Natick Town By-Laws including, without limitation, in Article 10 Section 3 and Article 22 Section 5 such that they comport with the Natick Home Rule Charter, and/or establish the assignment of counsel to town boards;

-Pursuant to MGL c. 40A s. 5 or otherwise; provide by amendment and/or addition to the Town of Natick Zoning By-Laws such that they comport with the Natick Home Rule Charter;

Or otherwise act thereon.

#### ARTICLE 39

#### Amend Natick Town Charter: Natick By-laws, Natick Zoning By-laws: Appointment and constitution of zoning board of appeals, division and distribution of powers, and assignment of counsel. (Julian Munnich et al)

To see if the Town will vote to amend the Town of Natick Home Rule Charter, the Natick Town By-Laws, and the Town of Natick Zoning By-Laws to; including but not limited to, adding new sections, and/or definitions, and/or amending existing sections and/or definitions, and/or providing for transition and implementation procedures; to provide for the division and exercise of functions to other appointed or elected bodies:

-Pursuant to MGL c. 40A s.12, MGL c. 4 s. 7, and MGL c. 43B s. 20 or otherwise; provide by amendment and/or addition to the charter, including but not limited to, in Article 3 for the appointment of members and associate members to the zoning board of appeals by a different appointing authority or in Article 3 for the election of a board of appeals, to change or to establish its number of members and associate members of the board of appeals; and/or to divide the assignment of functions to other appointed or elected bodies;

-Pursuant to MGL c. 40 s. 32 or otherwise; provide by amendment and/or addition to the Natick Town By-Laws such that they comport with the Natick Home Rule Charter, and/or to amend Article 22, including but not limited to Section 5, and/or Article 10, including but not limited to Section 3, of the Natick Town Bylaws, (respectively the Town Counsel and Board of Selectmen sections of the by-laws), including but not limited to Article 44 of the Natick Town By-Laws, and/or add new section to the By-Laws to: a) determine which multiple member bodies shall have the right to services of Town Counsel; and b) provide that multiple member bodies, and elected town officers, who are parties in interest or defendants in any matter connected to their official duties, shall have the right to bring and to settle legal action and to defense pertaining to such matters; and c) provide that the Board of Selectmen and Town Administrator not have authority to settle or to control such matters or to limit such control or involvement: and d) to determine the extent to which any or all multiple member bodies and/or elected town officers shall have rights to legal services and/or causes of action in connection with their official duties;

-Pursuant to MGL c. 40A s. 5 or otherwise; provide by amendment and/or addition or deletion to the Town of Natick Zoning By-Laws such that they comport with the Natick Home Rule Charter in regard to the appointment of the Zoning Board of Appeals, and division and exercise of functions;

Or otherwise act thereon.

#### ARTICLE 40 Amend the Town of Natick By-Laws: Create New Committee (Daniel Sullivan et al)

To see what action the Town will take to amend the Town of Natick By-Laws ("the By-Laws"), consistent with and pursuant to Article 2, Section 11(e) of the Town of Natick Home Rule Charter ("Committees"), the Massachusetts General Laws, Chapter 39 §16 or any other authority, to add a new and/or to amend an existing Article(s) or Section(s) of the By-Laws, including without limitation:

i) to create a standing committee, appointed by the Moderator, for the purpose of study, review, recommendation and/or report to Town Meeting on zoning warrant articles, motions and related zoning matters in advance of and/or in connection with Town Meeting action; and

ii) to allow such committee to conduct studies and analyses of the Town for the purpose of providing information and reports to Town Meeting and the Town on zoning, land use and related matters; and

iii) to determine the name, size and composition of such committee and to specify the eligibility, term and/or qualifications for an individual to be a member of such committee; and

iv) to provide and/or to allow for such committee to provide input, report, advice and recommendation to the Finance Committee in connection with the Finance Committee's consideration of warrant articles and other matters before Town Meeting and/or the Town; and

v) to provide that such committee, in connection with its work, have access to Town Counsel whether such provision is made in a new article or section of the By-Laws or within Article 22 -Town Counsel, Section 5 (c) of the By-Laws; and

vi) to specify any other powers, duties or responsibilities of such committee;

vii) provided however that no member of any elected Board or the Zoning Board of Appeals shall be eligible to serve on said committee;

or otherwise act thereon.

#### ARTICLE 41 Snow Removal ByLaw (Paul Griesmer, Joshua Ostroff, et al)

To see what action(s) the Town will take to help ensure public safety, access and convenience by amending Article 50 Section 18 and/or Article 92 of the Town ByLaws:

- 1) to clarify and/or to define, whether in whole or in part, what the term "public way(s)" shall mean for the purposes of Article 50 Section 18 or other purposes in the Bylaws, potentially including, without limitation, that the term "public way(s)" shall include streets to which the public has right of access; and/or
- 2) to change any fine in Section 18 to a different number or a schedule of fines for first and any enumerated or further list of offenses, and/or to add such fines or schedule to Article 92 of the ByLaws and provide a cross reference from Article 50 Section 18 to Article 92, and/or to delete or to modify subsection "a" in whole or in part and/or to add or to rearrange subsections within Article 18 to establish fines; and/or
- 3) to delete or to modify existing subsection "b" of Article 50 Section 18 and/or add new text in Article 50 Section 18; and/or
- 4) to insert a provision in subsection "b" or in a new subsection that no persons except employees and contractors of the Town in the lawful or authorized performance of Town snow removal duties, shall either move snow into and leave such snow within, or deposit and leave snow in any improved portion of i) any public sidewalk, ii) street or iii) public way or any part(s) thereof, so as to obstruct or impede regular snow removal operations of the Town; and/or
- 5) to provide that such prohibition above shall not prevent and shall not apply to the clearing, by persons other than Town employees or town contractors, of snow from either public ways, or improved sidewalk or street portions of public ways, where snow is or has been left un-

cleared by Town snow removal operations; provided that A) such snow clearing does not leave snow in sidewalks or streets areas already cleared by the Town, B) is incidental to or necessary for clearing access to private driveways, private sidewalks, private buildings or mailboxes and/or C) does not prevent or impede regular snow removal operations conducted by the Town to any greater extent than those regular Town snow removal operations would or should have done; and/or

- 6) to clarify or to define that "regular snow removal operations" refers to or means those snow removal operations, both which and in the manner they are regularly or routinely conducted by the Town in a timely manner practicable after a snowstorm; and/or
- 7) to make any other changes to the text of the Bylaws consistent with accomplishing the general purposes of this article, which purposes include, without limitation, the goals of ensuring public safety, access and convenience; allowing the Town to clear snow efficiently and effectively from improved sidewalks, streets or other portions of public ways; and of allowing residents and private property owners the ability to clear access to their properties;

or otherwise act thereon.

#### ARTICLE 42 Technical Changes to Charter and By-Laws (Paul Griesmer et al)

To see what action(s) the Town will take to amend the Town of Natick Home Rule Charter and/or the Town of Natick By-Laws ("the By-Laws"), to add new definitions, to amend existing articles and/or sections, whether by adding new language, removing existing language, changing exiting language or otherwise, and/or to add new articles and or sections including without limitation:

1) to restore, in whole or in part, or otherwise to provide new requirements within Article 7 Section 9 (a) of the Charter the provisions for calling meetings of multiple member bodies and notification to members including potentially, but not limiting the foregoing, a) that such meetings be called by the i) Chair, Vice Chair and/or secretary/clerk of the multiple member body and /or ii) 1/3 of the members of the multiple member body and b) that a minimum of 48 hours or 2 day notice, including the agenda items and/or then available advance materials, be given to each member of the multiple member body and/or c) that subsequently available advance materials be given to all members either in advance or at the same time; and/or

2) to clarify in Article 3 of or elsewhere in the Bylaws or the Charter a) that the Finance Committee public hearings on the proposed budget and its individual elements as described in and/or discussed in Article 5 Fiscal Procedures of the Charter and/or as contemplated in Article 23 of the Bylaws shall be required public hearings within the meaning of and subject to the requirements of Town Meeting Time, and/or b) that such public hearing requirements of Town Meeting Time shall also apply to or pertain to the subject matter of any related warrant article or portion thereof which includes any element of the proposed budget whether such preceding clarification(s) is(are) new or for the avoidance of any doubt and/or misunderstanding, and /or c) to allow Town Meeting, by 4/5ths or other greater super majority vote or unanimous consent, to consider part(s) of the proposed budget which have not been so heard by the Finance Committee or to prohibit, within the Bylaws or charter, such consideration until after the required public hearing is held and/or e) to determine whether the provisions of this paragraph of this warrant article shall also apply to all financial warrant articles and/or other warrant articles which are not part of the proposed provided that any such requirement(s) must also apply to all of the elements and/or items of the proposed budget; and/or

3) to create a definition of "resident" and /or "taxpayer" and/or to clarify that such terms mean only "of the Town of Natick" and/or to clarify the meaning of "of the Town of Natick"; and/or

4) to determine and or to define, without limitation, whether "resident" shall a) be defined in accordance with existing Federal, state or other statutes, regulations, legal requirements and/or practices of residency and/or b) be limited to or consist solely of individual human beings and/or to specify that any person registered to vote in a community other than the Town of Natick is not considered a resident of the Town; and/or

5) to determine and/or to define, without limitation, whether "taxpayer" shall a) be limited to or consist of real estate, personal property and/or other types of taxpayers, b) be limited to or consist of current taxpayers or taxpayers within the current fiscal year or other period(s) to be specified, c) to define whether taxpayer means and/or includes i) the actual payer of the tax, ii) the owner on whose behalf the tax is paid, iii) the owner of property who has paid tax or is subject to taxation, including taxes accruing and/or payable, d) to define whether the assessor's records and/or registry of deeds shall be conclusive for determining taxpayer status and/or e) to provide that taxpayers who no longer own property in the Town will not be considered taxpayers even if they paid tax within the current fiscal year; and/or

6) to determine whether these or any other new or existing definitions shall apply a) throughout the charter, b) for the purposes of specified articles and/or sections of the charter with such specific sections, if any, to be determined under this warrant article, c) throughout the ByLaws and/or d) for the purposes of specified Articles or sections of the ByLaws with such specific sections, if any, to be determined under this warrant article; and/or

7) to amend Charter Article 2 Section 10 (c) to a) completely re write this section, b) amend any wording within this section in whole or in part, c) to change the word "participate" in this section to "speak" or some other more limited term or verb, d) to change or delete the words "in the proceedings" so that the actions contemplated therein i) be limited to speaking and/or to other specified acts of participation, ii)) specifically exclude the ability to make motions and/or iii) be modified/limited in some further or other manner; and/or

8) to provide that corporate and/or other taxpayers who are not individual human beings shall a) be able to participate within the meaning of Charter Article 2 Section 10 (c) only through their officers and/or directors as listed with the Corporations Division of the Secretary of State of the Commonwealth, b) to i) limit such taxpayers in the previous clause to one or some other number of speaker(s) and/or ii) provide that such taxpayers shall be considered to be speaking for a second or further time when any officer or director of such corporation or legal entity seeks to be recognized for a second or further time on an article or motion in the basis of standing as a taxpayer, and/or c) to preclude non-resident and or non-taxpayer representatives, attorneys and/or agents of such taxpayers and/or of any resident from speaking without permission of Town Meeting, whether these changes in this paragraph are made i) within Article 2 of the Charter, ii) the text of new or existing definitions in the Charter and/or Bylaws, iii) within Article 3 of the Bylaws and/or other appropriate Article or section of the charter or bylaws; and/or

9) to change Charter Article 7 Section 9 b so that the members of the public be changed to or defined as residents or taxpayers, as defined, and /or as contemplated elsewhere within this warrant article and/or to provide or to limit the subjects about which questions may be asked, opinions stated and/or information exchanged be limited and/or to determine the manner, type or extent of such limitation(s) and/or to require that any such topics be limited to matters which are within the i) official scope, authority, reach, extent, purview, depth, width, responsibility, jurisdiction, role and/or responsibility of a multiple member body and/or ii) current practice of such multiple member body and/or to define current practice whether within the aforesaid section or elsewhere in the charter or Bylaws and/or iii) to provide that current practice of a multiple member body shall be measured only from the most recent annual and/or once a year reorganization of a multiple member body; and/or

10) to clarify in Article 3 of or elsewhere in the Bylaws or the charter a) that the Finance Committee public hearings as discussed in Article 5 Fiscal Procedures of the Charter and/or as contemplated in Article 23 of the Bylaws shall be public hearings at which only residents and /or taxpayers, as defined, shall have the right to speak and/or be heard, that persons who are not residents or not taxpayers may be heard only with the permission of the Finance Committee as contemplated for rules provided elsewhere within this warrant article for multiple member bodies; and/or

11) to amend the Charter to allow the representative Town Meeting by ByLaw i) to create uniform rules for all multiple member bodies with regard to any of the subject matter in Article 7

section 9(b) of the Charter, ii) to create and apply such rules to certain multiple member bodies only and/or iii) to create and apply such rules to all multiple member bodies with specific exceptions; and/or

12) to create and to apply any other definitions within all or certain parts of the charter and /or bylaws to accomplish the purpose(s) of this warrant article;

or otherwise act thereon.

The above articles are to be acted upon and determined exclusively by Town Meeting Members in accordance with Chapter 2 of the Acts of 1938 and Amendments thereto and the Town Charter and subject to the referendum provided thereby.

And you are directed to serve this Warrant by causing an attested copy of said Warrant to be posted in the Post Office in said Natick; and at the following public places in said Natick, to wit: Precinct 1, Reliable Cleaners, 214 West Central Street; Precinct 2, Cole Recreation Center, 179 Boden Lane; Precinct 3, Kennedy Middle School, 165 Mill St.; Precinct 4, Lola's, 9 Main Street; Precinct 5, Wilson Middle School, 22 Rutledge Road; Precinct 6, East Natick Fire Station, 2 Rhode Island Avenue; Precinct 7, Lilja Elementary School, 41 Bacon Street; Precinct 8, Natick High School, 15 West Street; Precinct 9, Community Senior Center, 117 East Central Street and Precinct 10, Memorial Elementary School, 107 Eliot Street.

Above locations being at least one public place in each Precinct, in the Town of Natick, and also posted in the Natick U.S. Post Office, Town Hall, Bacon Free Library and Morse Institute Library seven days at least before October 16, 2018; also by causing the titles of the articles on the Warrant for the 2018 Fall Annual Town Meeting to be published once in the Newspaper called "The MetroWest Daily News," with notice of availability of an attested copy of said Warrant, said Newspaper published in the Town of Natick and said publication to be August 24, 2018.

Hereof fail not and make due return of this Warrant with your doings thereon to the Town Clerk at or before the time appointed for holding said meeting.

Given under our hands this, 20th Day of August, 2018.

AMY K. MISTROT Chair SUSAN G. SALAMOFF Vice Chair MICHAEL J. HICKEY, JR Clerk

JONATHAN H. FREEDMAN Member RICHARD P. JENNETT, JR Member

Board of Selectmen for the Town of Natick

Certified copies of the Warrant are available at the Office of the Town Clerk, Natick Town Hall, 13 East Central St., Natick, MA between the hours of 8:00 a.m. – 5:00 p.m., Monday through Wednesday; 8:00 a.m.-7:00 p.m. on Thursday and 8:00 a.m.-12:30 p.m. Friday; the Warrant may also be accessed from the Town web site <u>www.natickma.gov.</u>

#### OFFICER'S RETURN COMMONWEALTH OF MASSACHUSETTS

Natick, Middlesex

Pursuant to the Warrant for the 2018 Natick Fall Annual Town Meeting, I have this day notified the qualified Town Meeting Members to assemble at the time, place and for the purpose within mentioned by posting the Warrant as within directed and in accordance with the Town of Natick Home Rule Charter and the Town of Natick By-Laws.

DATE(S) DULY POSTED \_\_\_\_\_

Signature of Constable

Date

### OFFICER'S RETURN COMMONWEALTH OF MASSACHUSETTS

Natick, Middlesex

Pursuant to the Town of Natick Home Rule Charter and the Town of Natick By-Laws, I have caused the titles of the articles on the Warrant for the 2018 Natick Fall Annual Town Meeting and a notice of availability of an attested copy of said Warrant to be published in the newspaper called *The MetroWest Daily News*, in the issue published in the said Town of Natick on August 24, 2018. This same Warrant is posted on the Town of Natick Web Site at www.natickma.gov.

Signature of Town Administrator

Date

**ITEM TITLE:** Announce 2018 Special Town Meeting #2: Tuesday, October 2, 2018, 7:30 P.M.

## ITEM SUMMARY:

### ATTACHMENTS: Description Notice

**Upload Date** 8/17/2018

**Type** Cover Memo

## PUBLIC NOTICE

## TOWN OF NATICK

### BOARD OF SELECTMEN

The Board of Selectmen hereby gives public notice that it has called

#### SPECIAL TOWN MEETING NO.2

### ON TUESDAY, OCTOBER 2, 2018

#### NATICK HIGH SCHOOL AUDITORIUM

#### 7:30 p.m.

The warrant will open on Tuesday, August 21, 2018 and close at 5:00 p.m. on Thursday, August 23, 2018. All articles to be included in the warrant for Special Town Meeting No. 2 must be received in the Office of the Board of Selectmen, Room 213, 13 East Central Street, Natick, Massachusetts 01760 no later than 5:00 p.m. on August 23, 2018. The Board of Selectmen encourages petitioners and others submitting articles to provide such materials electronically to selectmen@natickma.org by such date and time; if submitting through this format, petitioners are advised to request a "read receipt" to verify proper and timely receipt by the Board of Selectmen's Office. The Board of Selectmen further encourages that articles be submitted in narrative format only, and that maps and other supplementary material not be included as part of the warrant article.

Michael J. Hickey, Jr., Clerk

ITEM TITLE: Schedule Presentation of Resolution Honoring Lynda Simkins, Former Executive Director of the Natick Community Organic Farm

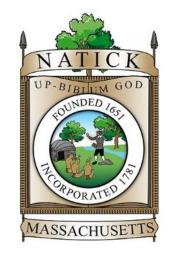
## **ITEM SUMMARY:**

## ITEM TITLE: West Natick Fire Station: Vote to Support Town Administrator's Funding/Financing Recommendation

### **ITEM SUMMARY:**

#### ATTACHMENTS:

Description	Upload Date	Туре
FINAL Capital Financing Recommendation- KMS & WNFS	8/18/2018	Cover Memo
Capital Financing Recommendation	8/14/2018	Cover Memo
Capital Financing Presentation-WNFS & Kennedy	8/9/2018	Cover Memo
Capital Planning	8/17/2018	Cover Memo



# Capital Financing Recommendation Kennedy Middle School & West Natick Fire Station

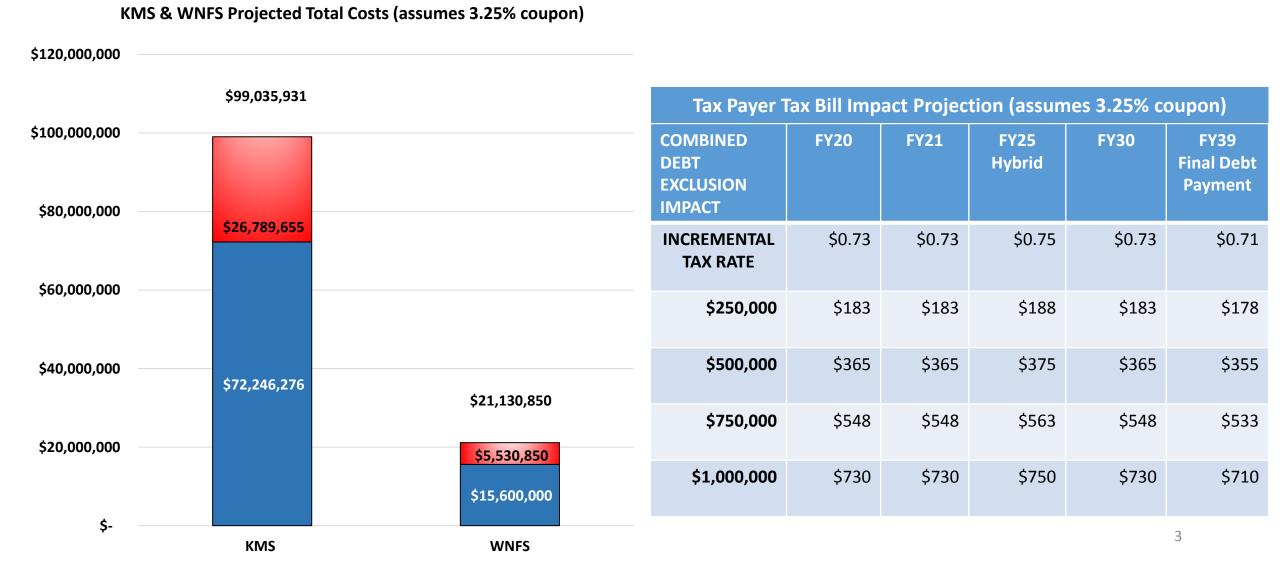
**Board of Selectmen** 

August 20, 2018

Table of Contents	
Town Administrator's Financing Recommendation for WNFS & KMS	3
Town Administrator's Financing Recommendation Details	4-6
Requested Model Financing 1	7-8
Model Financing 2	9-11
KMS & WNFS Debt Cost Comparison	12
Questions / Concerns	13

## Town Administrator's Financing Recommendation:

KMS Level Debt Service 20 Years & WNFS Hybrid Debt Service 20 Years (5 yr. level debt, 15 yrs. level principal)



#### Town of Natick, Massachusetts - DEBT EXCLUDED FROM PROP 2 1/2 Financing Plan G - \$15.6M Fire Station 20yrs (Hybrid) & \$72.250M School 20yrs (Level)

SCHOOL	ONLY - DEBT	SERVICE SC	CHEDULE		FIRE	STATION ONL	Y - DEBT SEF		JLE
Fiscal Year	Principal	Coupon	Interest	Total P+I	Fiscal Year	Principal	Coupon	Interest	Total P+I
6/30/2020 6/30/2021	2,050,000 2,715,000	3.25% 3.25%	2,901,844 2,237,381	4,951,844 4,952,381	6/30/2020 6/30/2021	445,000 585,000	3.25% 3.25%	626,519 483,031	1,071,519 1,068,031
6/30/2022 6/30/2023 6/30/2024	2,805,000 2,895,000 2,995,000	3.25% 3.25% 3.25%	2,147,681 2,055,056 1,959,344	4,952,681 4,950,056 4,954,344	6/30/2022 6/30/2023 6/30/2024	605,000 625,000 645,000	3.25% 3.25% 3.25%	463,694 443,706 423,069	1,068,694 1,068,706 1,068,069
6/30/2025 6/30/2026 6/30/2027	3,090,000 3,195,000 3,300,000	3.25% 3.25% 3.25%	1,860,463 1,758,331 1,652,788	4,950,463 4,953,331 4,952,788	6/30/2025 6/30/2026 6/30/2027	850,000 850,000 850,000	3.25% 3.25% 3.25%	398,775 371,150 343,525	1,248,775 1,221,150 1,193,525
6/30/2028 6/30/2029	3,410,000 3,520,000	3.25% 3.25%	1,543,750 1,431,138	4,953,750 4,951,138	6/30/2028 6/30/2029 6/30/2030	850,000 845,000	3.25% 3.25%	315,900 288,356	1,165,900 1,133,356
6/30/2030 6/30/2031 6/30/2032	3,635,000 3,755,000 3,880,000	3.25% 3.25% 3.25%	1,314,869 1,194,781 1,070,713	4,949,869 4,949,781 4,950,713	6/30/2031 6/30/2032	845,000 845,000 845,000	3.25% 3.25% 3.25%	260,894 233,431 205,969	1,105,894 1,078,431 1,050,969
6/30/2033 6/30/2034 6/30/2035	4,010,000 4,140,000 4,280,000	3.25% 3.25% 3.25%	942,500 810,063 673,238	4,952,500 4,950,063 4,953,238	6/30/2033 6/30/2034 6/30/2035	845,000 845,000 845,000	3.25% 3.25% 3.25%	178,506 151,044 123,581	1,023,506 996,044 968,581
6/30/2036 6/30/2037 6/30/2038	4,420,000 4,565,000 4,715,000	3.25% 3.25% 3.25%	531,863 385,856 235,056	4,951,863 4,950,856 4,950,056	6/30/2036 6/30/2037 6/30/2038	845,000 845,000 845,000	3.25% 3.25% 3.25%	96,119 68,656 41,194	941,119 913,656 886,194
6/30/2039	4,875,000	3.25%	79,219	4,954,219	6/30/2039	845,000	3.25%	13,731	858,731
Total	72,250,000		26,785,931	99,035,931	Total	15,600,000		5,530,850	21,130,850



# **Projected Debt Costs**

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		Outstan	Outstanding Debt			proved Projects		Projected		
Fiscal Year		Excluded		W/I Levy	-	W/I Levy		Capital Request	T	otal General Fund
2020	S	4,334,763	s	4,317,229	\$	1,353,538	s	534,689	s	10,540,21
2021	S	4,228,171	S	3,474,168	\$	1,325,217	s	3,852,140	S	12,879,69
2022	S	4,118,730	S	2,966,399	\$	1,296,897	s	5,177,169	S	13,559,19
2023	S	4,019,639	S	2,545,640	\$	1,268,576	s	5,939,079	S	13,772,93
2024	S	3,918,068	S	2,296,942	\$	1,240,256	s	5,803,856	S	13,259,12
2025	S	3,283,696	S	1,974,752	\$	1,196,935	s	5,531,552	S	11,986,93
2026	S	3,194,884	S	1,529,702	\$	1,169,102	s	5,348,488	S	11,242,17
2027	S	3,105,128	S	1,217,921	\$	1,086,269	s	5,137,763	S	10,547,0
2028	S	3,003,197	S	1,125,182	\$	1,060,224	s	4,604,614	\$	9,793,2
2029	5	2,901,266	\$	1,057,743	\$	1,034,178	s	4,260,595	\$	9,253,7
2030	S	2,799,335	\$	924,604	5	988,133	s	3,945,450	5	8,657,5
2031	S	2,697,404	\$	824,599	\$	962,737	\$	3,824,538	\$	8,309,2
2032	S	160,473	\$	733,027	\$	937,342	s	3,702,506	\$	5,533,3
2033	\$	155,753	\$	509,978	\$	911,946	s	3,602,975	\$	5,180,6
2034			\$	308,000	\$	886,551	\$	3,503,444	\$	4,697,9
2035			\$	299,850	\$	326,480	s	3,183,913	\$	3,810,2
2036			S	216,700	5	318,472	s	2,544,865	\$	3,080,0
2037			S	161,425	5	310,464	s	2,125,175	\$	2,597,0
2038			S	116,725	\$	302,456	s	1,681,919	S	2,101,1
2039				. 333	\$	294,448	s	1,632,113	S	1,926,5
2040					\$	286,440	s	1,582,306	S	1,868,7
2041					\$	278,432	s	425,000	S	703,4
2042					\$	270,424	s	-	S	270,4
2043					\$	262,416			S	262,4
2044					\$	254,408			S	254,4
Total	Ş	41,920,507	S	26,600,586	\$	19,622,338	\$	77,944,147	ş	166,087,5

\* This table excludes Fire Station 4 (West Natick) and the Kennedy Middle School

#### Town of Natick, Massachusetts - DEBT EXCLUDED FROM PROP 2 1/2

Estimated Fire Station:	\$ 15,600,000
Maximum Term of Fire Station:	20 years
Amortization of Fire Station:	HYBRID DEBT SERVICE
Projected Bond Rate for Fire Station:	3.25%
School Total Project Cost:	\$ 109,560,000
Est. MSBA Reimbursement (48.21%)	\$ 37,313,724
Est. Local Share of Project Costs:	\$ 72,246,276
Maximum Term of School:	20 years
Amortization of School:	LEVEL DEBT SERVICE
Projected Bond Rate for School:	3.25%
Dated Date of Bonds:	December 1, 2018
FY2018 Assessed Valuation:	\$ 8,229,002,220

#### Financing Plan G - \$15.6M Fire Station 20yrs (Hybrid) & \$72.250M School 20yrs (Level)

#### EXEMPT General Fund Debt Service Only

	Α	В	С	D (A	-B-C)	E		F			3	
Fiscal Year	Existing Debt Service (see pages 2-4)	Less: Enterprise Supported Debt Service (see page 5)	Less: Existing General Fund NON-Exempt Debt Service (see pages 6-8)	Existing General Fund Exempt Debt Service (see page 9)	Existing Tax Rate Impact per \$1,000	Plus \$72.250M School Bonds (see pages 10 & 11)	Est. School Debt Service Tax Rate Impact per \$1,000	Plus \$15.6M Fire Station Bonds (see pages 10 & 11)	Est. Fire Station Debt Service Tax Rate Impact per \$1,000	Existing and Projected Exempt Debt Service (D+E+F)	Existing and Projected Est. Tax Rate Impact per \$1,000	Fiscal Year
2018	13,104,520	2,945,561	5,586,514	4,572,445	0.56	-	-	-	-	4,572,445	0.56	2018
2019	11,962,957	2,612,729	4,884,224	4,466,004	0.54	-	-	-	-	4,466,004	0.54	2019
2020	10,997,430	2,369,664	4,293,004	4,334,763	0.53	4,951,844	0.60	1,071,519	0.13	10,358,125	1.26	2020
2021	9,676,467	1,998,353	3,449,943	4,228,171	0.51	4,952,381	0.60	1,068,031	0.13	10,248,584	1.25	2021
2022	8,945,596	1,884,692	2,942,174	4,118,730	0.50	4,952,681	0.60	1,068,694	0.13	10,140,105	1.23	2022
2023	8,099,610	1,558,557	2,521,415	4,019,639	0.49	4,950,056	0.60	1,068,706	0.13	10,038,401	1.22	2023
2024	7,605,853	1,415,068	2,272,717	3,918,068	0.48	4,954,344	0.60	1,068,069	0.13	9,940,480	1.21	2024
2025	6,556,894	1,322,671	1,950,527	3,283,696	0.40	4,950,463	0.60	1,248,775	0.15	9,482,933	1.15	2025
2026	5,641,905	921,339	1,525,682	3,194,884	0.39	4,953,331	0.60	1,221,150	0.15	9,369,365	1.14	2026
2027	5,080,624	761,595	1,213,901	3,105,128	0.38	4,952,788	0.60	1,193,525	0.15	9,251,440	1.12	2027
2028	4,728,341	599,963	1,125,182	3,003,197	0.36	4,953,750	0.60	1,165,900	0.14	9,122,847	1.11	2028
2029	4,420,921	461,913	1,057,743	2,901,266	0.35	4,951,138	0.60	1,133,356	0.14	8,985,760	1.09	2029
2030	4,135,451	411,513	924,604	2,799,335	0.34	4,949,869	0.60	1,105,894	0.13	8,855,097	1.08	2030
2031	3,921,516	399,513	824,599	2,697,404	0.33	4,949,781	0.60	1,078,431	0.13	8,725,616	1.06	2031
2032	1,276,912	383,413	733,027	160,473	0.02	4,950,713	0.60	1,050,969	0.13	6,162,154	0.75	2032
2033	932,619	266,888	509,978	155,753	0.02	4,952,500	0.60	1,023,506	0.12	6,131,759	0.75	2033
2034	567,988	259,988	308,000	-	-	4,950,063	0.60	996,044	0.12	5,946,106	0.72	2034
2035	552,938	253,088	299,850	-	-	4,953,238	0.60	968,581	0.12	5,921,819	0.72	2035
2036	457,888	241,188	216,700	-	-	4,951,863	0.60	941,119	0.11	5,892,981	0.72	2036
2037	395,863	234,438	161,425	-	-	4,950,856	0.60	913,656	0.11	5,864,513	0.71	2037
2038	294,350	177,625	116,725	-	-	4,950,056	0.60	886,194	0.11	5,836,250	0.71	2038
2039	-	-	-	-	-	4,954,219	0.60	858,731	0.10	5,812,950	0.71	2039
2040	-	-	-	-	-	-	-	-	-	-	-	2040
2041	-	-	-	-	-	-	-	-	-	-	-	2041
2042	-	-	-	-	-	-	-	-	-	-	-	2042
2043	-	-	-	-	-	-	-	-	-	-	-	2043
2044	-	-	-		-	-	-	-	-	-	-	2044
Total	109,356,641	21,479,753	36,917,933	50,958,955		99,035,931		21,130,850		171,125,736		

#### Assumptions:

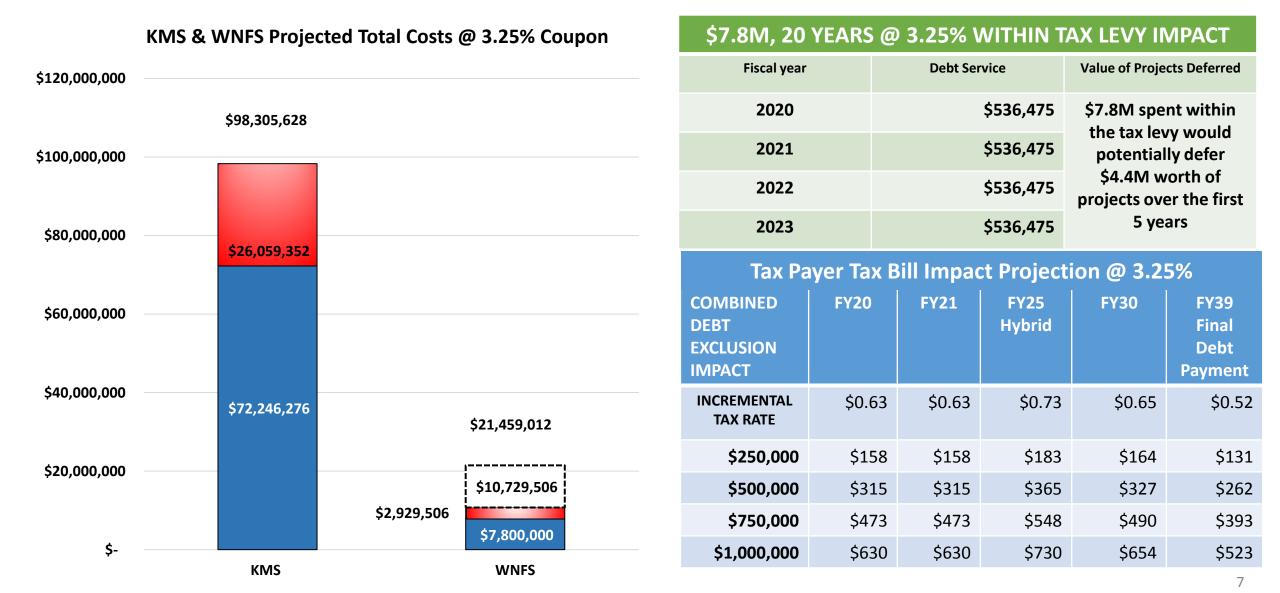
Fire Station structured on a hybrid debt basis; level debt first 5yrs then equal/declining principal.

School bonds structured on a level debt basis.

Bonds structured a long first coupon; no impact in FY19.

## **Requested Model Financing 1:**

KMS Hybrid Debt Service 20 Years & WNFS Debt Exclusion \$7.8M Level Debt Service; Tax Levy \$7.8M Level Debt Service 20 Years @ 3.25%

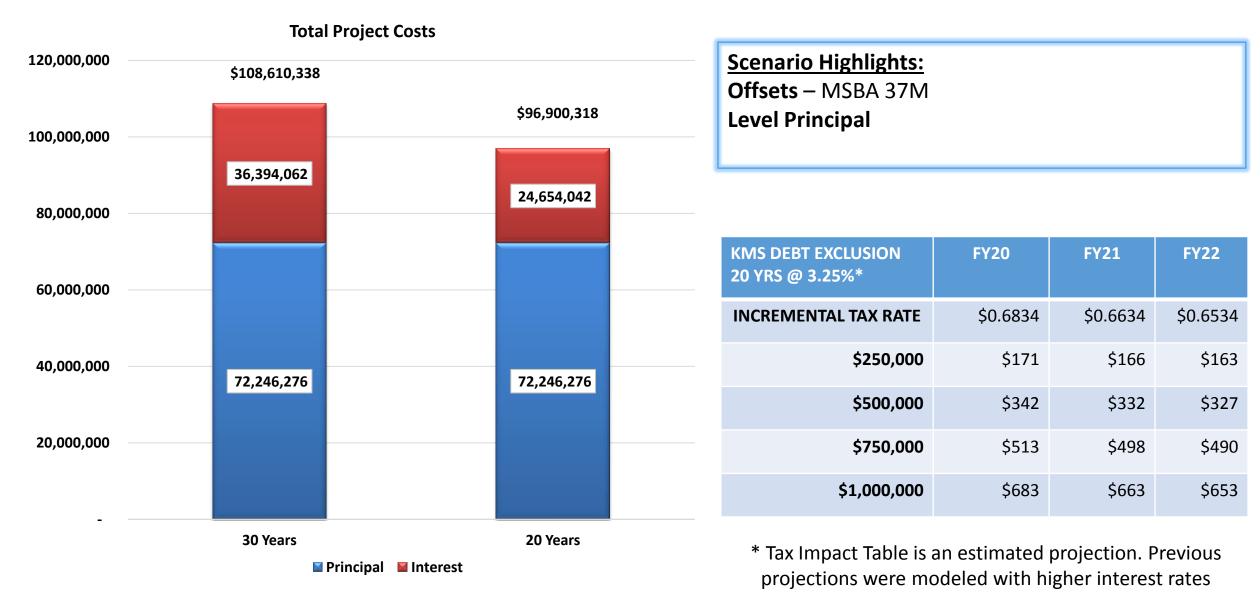


## Requested Model Financing Debt Service Detail:

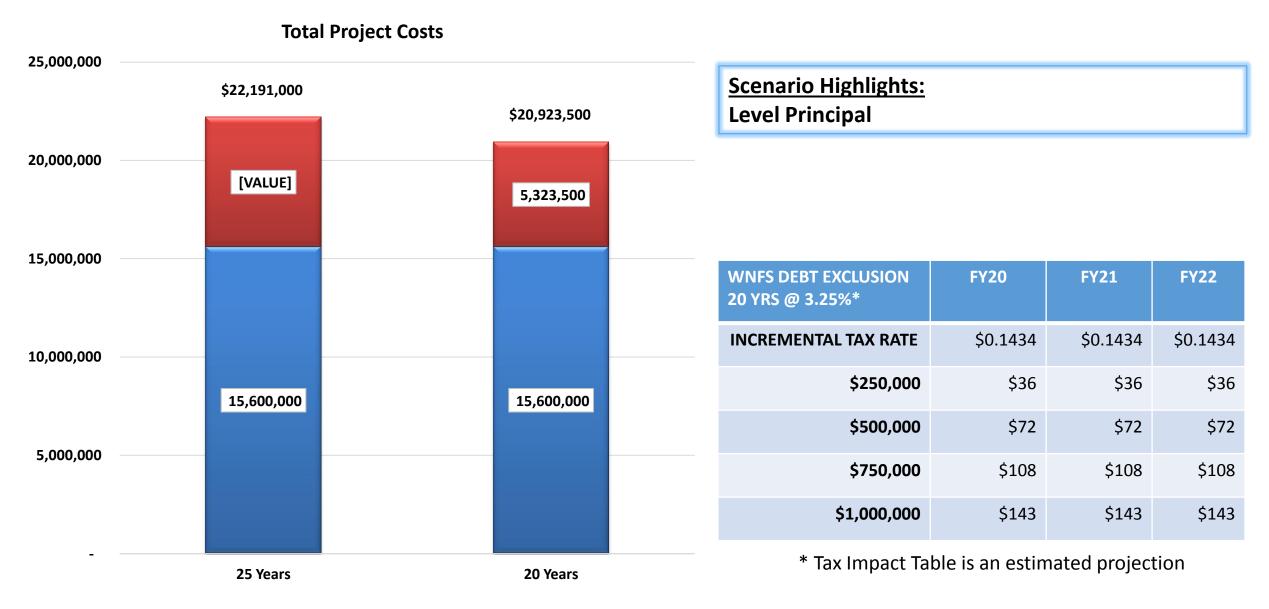
Debt Service Schedule Detail

۵ کی ۵		Debt Service								Debt Ser	vice						
NATICK						-		NATICK									
		Project:	Wes	t Na	tick Fire Sta	ation				Project:		—			KMS		
- (( ) -		Total Cost:		ć	15,600,000					Total Co	<b>~+</b> .			\$	72,246,276		
- PORPORATEU		Offsetting Fu	nds:	<u> </u>	(7,800,000)			P CORPORATE			ng Funds:			ې \$	72,240,270		
MASSACHUSETTS		Cost to be Iss		<u> </u>	7,800,000			MASSACHUSETTS			e Issued:			ې \$	72,246,276		
		Term:		) Ye				who when		Term:	e issueu.		20	Year			
		Interest	\$ 2,929,506		3.25%					Interest		Ś	26,059,352	rear	3.25%		
		Starting Year	F		2020	\$ 10,729,506				Starting	Year	- <b>-</b>	FY		2020	Ś	98,305,628
																	,,
Beg Bal	<u>FY</u>	Principal	Interest		<u>Total</u>	End Bal		Beg Bal	<u>FY</u>	Pri	ncipal		<u>Interest</u>		<u>Total</u>		End Bal
\$ 7,800,000	2020	\$ 282,975	\$ 253,500	\$	536,475	\$ 7,517,025	1	\$72,246,276	2020	\$	2,600,000	\$	2,348,004	\$	4,948,004	\$	69,646,276
\$ 7,517,025	2021	\$ 292,172	\$ 244,303	\$	536,475	\$ 7,224,853	2	\$69,646,276	2021	\$	2,675,000	\$	2,263,504	\$	4,938,504	\$	66,971,276
\$ 7,224,853	2022	\$ 301,668	\$ 234,808	\$	536,475	\$ 6,923,185	3	\$66,971,276	2022	\$	2,750,000	\$	2,176,566	\$	4,926,566	\$	64,221,276
\$ 6,923,185	2023	\$ 311,472	\$ 225,004	\$	536,475	\$ 6,611,713	4	\$64,221,276	2023	\$	2,850,000	\$	2,087,191	\$	4,937,191	\$	61,371,276
\$ 6,611,713	2024	\$ 321,595	\$ 214,881	\$	536,475	\$ 6,290,119	5	\$61,371,276	2024	\$	2,950,000	\$	1,994,566	\$	4,944,566	\$	58,421,276
\$ 6,290,119	2025	\$ 332,046	\$ 204,429	\$	536,475	\$ 5,958,072	6	\$58,421,276	2025	\$	3,894,752	\$	1,898,691	\$	5,793,443	\$	54,526,524
\$ 5,958,072	2026	\$ 342,838	\$ 193,637	\$	536,475	\$ 5,615,234	7	\$54,526,524	2026	\$	3,894,752	\$	1,772,112	\$	5,666,864	\$	50,631,772
\$ 5,615,234	2027	\$ 353,980	\$ 182,495	\$	536,475	\$ 5,261,254	8	\$50,631,772	2027	\$	3,894,752	\$	1,645,533	\$	5,540,285	\$	46,737,020
\$ 5,261,254	2028	\$ 365,485	\$ 170,991	\$	536,475	\$ 4,895,770	9	\$46,737,020	2028	\$	3,894,752	\$	1,518,953	\$	5,413,705	\$	42,842,268
\$ 4,895,770	2029	\$ 377,363	\$ 159,113	\$	536,475	\$ 4,518,407	10	\$42,842,268	2029	\$	3,894,752	\$	1,392,374	\$	5,287,126	\$	38,947,516
\$ 4,518,407	2030	\$ 389,627	\$ 146,848	\$	536,475	\$ 4,128,780	11	\$38,947,516	2030	\$	3,894,752	\$	1,265,794	\$	5,160,546	\$	35,052,764
\$ 4,128,780	2031	\$ 402,290	\$ 134,185	\$	536,475	\$ 3,726,490	12	\$35,052,764	2031	\$	3,894,752	\$	1,139,215	\$	5,033,967	\$	31,158,012
\$ 3,726,490	2032	\$ 415,364	\$ 121,111	\$	536,475	\$ 3,311,125	13	\$31,158,012	2032	\$	3,894,752	\$	1,012,635	\$	4,907,387	\$	27,263,260
\$ 3,311,125	2033	\$ 428,864	\$ 107,612	\$	536,475	\$ 2,882,262	14	\$27,263,260	2033	\$	3,894,752	\$	886,056	\$	4,780,808	\$	23,368,508
\$ 2,882,262	2034	\$ 442,802	\$ 93,674	\$	536,475	\$ 2,439,460	15	\$23,368,508	2034	\$	3,894,752		759,477	\$	4,654,229	\$	19,473,756
\$ 2,439,460	2035	\$ 457,193	\$ 79,282	\$	536,475	\$ 1,982,267	16	\$19,473,756	2035	\$	3,894,752	\$	632,897	\$	4,527,649	\$	15,579,004
\$ 1,982,267	2036	\$ 472,052	\$ 64,424	\$	536,475	\$ 1,510,216	17	\$15,579,004	2036	\$	3,894,751	\$	506,318	\$	4,401,069	\$	11,684,253
\$ 1,510,216	2037	\$ 487,393	\$ 49,082	\$	536,475	\$ 1,022,822	18	\$11,684,253	2037	\$	3,894,751	\$	379,738	\$	4,274,489	\$	7,789,502
\$ 1,022,822	2038	\$ 503,234	\$ 33,242	\$	536,475	\$ 519,589	19	\$ 7,789,502	2038	\$	3,894,751	\$	253,159	\$	4,147,910	\$	3,894,751
\$ 519,589	2039	\$ 519,589	\$ 16,887	\$	536,475	\$ (0)	20	\$ 3,894,751	2039	\$	3,894,751	\$	126,568	\$	4,021,319	\$	-

## Finance Model 2: Kennedy Middle School Financing – Debt Exclusion



## West Natick Fire Station Financing – Debt Exclusion

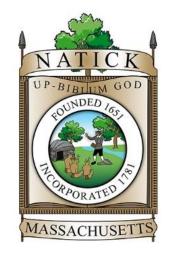


# KMS & WNFS Debt Cost Comparison

Financing Methodology Co	ost Comparison (a	assuming 20 Years (	@ 3.25%)
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	Principal	Interest	Total Cost
Administrator's Recommendation	\$87,846,276	\$32,320,505	\$120,166,781
Requested Financing Model 1: KMS Hybrid Debt Service 20 Years & WNFS Debt Exclusion \$7.8M Level Debt Service; Tax Levy \$7.8M Level Debt Service	\$87,846,276	\$31,918,364	\$119,764,640
Financing Model 2: Level Principal Debt Service	\$87,846,276	\$29,977,542	\$117,823,818

# QUESTIONS / CONCERNS?



# Capital Financing Recommendation Kennedy Middle School & West Natick Fire Station

**Board of Selectmen** 

August 14, 2018

# **Projected Debt Costs**

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		Outstan	ding I	Debt	A	oproved Projects		Projected		
Fiscal Year		Excluded		W/I Levy	-	W/I Levy		Capital Request	T	otal General Fund
2020	S	4,334,763	s	4,317,229	\$	1,353,538	s	534,689	s	10,540,21
2021	S	4,228,171	S	3,474,168	\$	1,325,217	s	3,852,140	S	12,879,69
2022	S	4,118,730	S	2,966,399	\$	1,296,897	s	5,177,169	S	13,559,19
2023	S	4,019,639	S	2,545,640	S	1,268,576	s	5,939,079	S	13,772,93
2024	S	3,918,068	S	2,296,942	S	1,240,256	s	5,803,856	s	13,259,12
2025	S	3,283,696	S	1,974,752	\$	1,196,935	s	5,531,552	S	11,986,93
2026	S	3,194,884	S	1,529,702	\$	1,169,102	s	5,348,488	S	11,242,17
2027	S	3,105,128	S	1,217,921	\$	1,086,269	s	5,137,763	S	10,547,08
2028	S	3,003,197	\$	1,125,182	\$	1,060,224	s	4,604,614	5	9,793,21
2029	S	2,901,266	\$	1,057,743	\$	1,034,178	s	4,260,595	5	9,253,78
2030	S	2,799,335	\$	924,604	5	988,133	s	3,945,450	5	8,657,52
2031	S	2,697,404	\$	824,599	\$	962,737	\$	3,824,538	\$	8,309,23
2032	S	160,473	\$	733,027	\$	937,342	s	3,702,506	\$	5,533,34
2033	5	155,753	\$	509,978	\$	911,946	\$	3,602,975	\$	5,180,65
2034	100		\$	308,000	5	886,551	s	3,503,444	\$	4,697,99
2035			\$	299,850	5	326,480	s	3,183,913	\$	3,810,24
2036			\$	216,700	5	318,472	s	2,544,865	\$	3,080,03
2037			\$	161,425	5	310,464	s	2,125,175	\$	2,597,00
2038			S	116,725	\$	302,456	s	1,681,919	5	2,101,10
2039				. 333	\$	294,448	s	1,632,113	S	1,926,56
2040					\$	286,440	s	1,582,306	S	1,868,74
2041					\$	278,432	s	425,000	S	703,43
2042					\$	270,424	s	-	S	270,42
2043					\$	262,416			S	262,43
2044					\$	254,408			S	254,40
Total	Ş	41,920,507	s	26,600,586	\$	19,622,338	\$	77,944,147	s	166,087,57

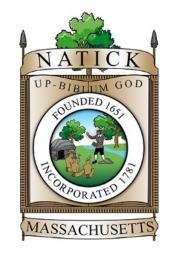
\* This table excludes Fire Station 4 (West Natick) and the Kennedy Middle School

## Financing Recommendation:

KMS Level Debt Service 20 Years & 3.25% & WNFS Hybrid Debt Service 20 Years @ 3.25%



**WNFS** 



# Capital Financing Kennedy Middle School & West Natick Fire Station

**BOARD OF SELECTMEN** 

AUGUST 6, 2018

# **Project Backgrounds**

## **KENNEDY MIDDLE SCHOOL**

## WEST NATICK FIRE STATION

Project approved Spring of 2018

Current Design - Total Project Estimated Cost \$109,560,000

MSBA Offsets \$37M

Status – Construction Design Phase; start of Construction March 2019

**Debt Exclusion Ballot Question Approved** 

Project prepared by WNFS Building Committee

Current Design – Total Project Estimated Cost \$15,600,000

Potential Offsets (Free Cash and Capital Stabilization)

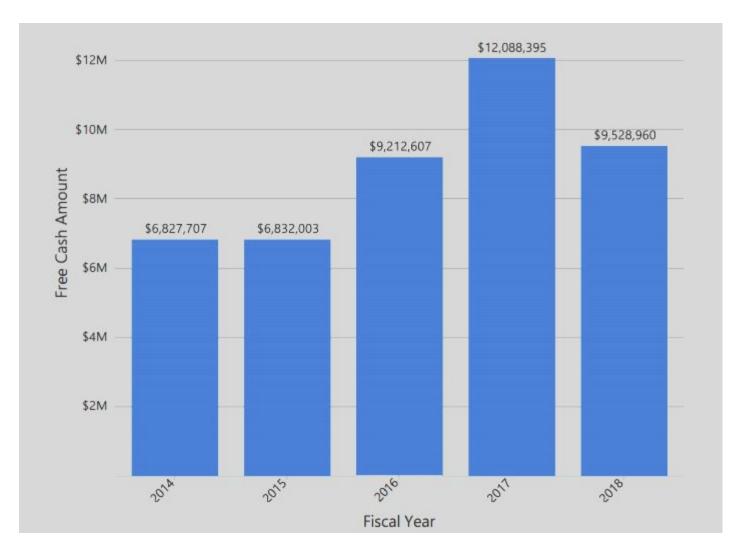
Status – Reviewing funding options for project

Debt Exclusion Ballot Question - November 2018

# **Stabilization Fund Balances**

DESCRIPTION	BALANCE	FUNDING
Capital Stabilization	\$8,027,354	Local Options Tax
Stabilization (Rainy Day)	\$4,570,303	2-5% of GF Revenue
OPEB Trust	\$3,260,603	Free Cash
Operational Stabilization	\$3,070,495	10% State & 5% Local of 3 years receipts
FAR Bonus Stabilization	\$2,524,966	FAR Funds
Infiltration & Inflow Stabilization	\$976,496	Enterprise I & I Funds
1:1 Technology Stabilization	\$1,969	

## **Certified Free Cash History**



# **Five Year Capital Plan**

## Approved General Fund Projects

Authoriz ation	Description	Amount	Source
2016SATM29	22 Pleasant Street Land Acquisition	\$ 3,200,000	Tax Levy Borrowing
2016SPEC3	CRT Land Acquisition	\$ 2,960,000	Tax Levy Borrowing
2018SATM13C1	Replace S-5 Fire Alarm and Signal Bucket Truck	\$ 200,000	Tax Levy Borrowing
2018SATM14B1	Engineering & Repairs To The Charles River Dam	\$ 675,000	Tax Levy Borrowing
2018SATM14B2	Roadway & Sidewalks Supplement	\$ 1,000,000	Tax Levy Borrowing
2018SATM14B3	Roadway Improvements Washington Avenue	\$ 2,500,000	Tax Levy Borrowing
2017FATM9C7	Replace SCBA Equipment	\$ 350,000	Tax Levy Borrowing
2017FATM10B3	East Field Renovations	\$ 2,535,000	Tax Levy Borrowing
2017FATM10B4	Navy Yard Field Renovations	\$ 1,600,000	Tax Levy Borrowing
2018SPEC1	Kennedy Middle School	\$ 105,835,000	Debt Excluded Borrowing

## Pending Projects - Under Review - 2018 Fall Annual Town Meeting

Authoriz ation	Description	Amount	Source
2018FATM	Replace Fire Station 4 (West Natick)	\$ 15,560,000	Tax Levy Borrowing
2018FATM	Construction - Roadway Improvements South Main St.	\$ 3,000,000	Tax Levy Borrowing
2018FATM	Replacing S-34 Trash Packer	\$ 305,000	Tax Levy Borrowing
2018FATM	North Ave Area Drainage Improvements	\$ 300,000	Tax Levy Borrowing
2018FATM	Replace H-43 Truck/Sander	\$ 250,000	Tax Levy Borrowing
2018FATM	Replace H-70 Trackless	\$ 250,000	Tax Levy Borrowing
2018FATM	Memorial Sch - Replace Exterior Windows (Engineering)	\$ 120,000	Tax Levy Borrowing
2018FATM	Building Addition 75 West Street (Engineering)	\$ 60,000	Tax Levy Borrowing
2018FATM	Public Safety Building - Replace Roof (Engineering)	\$ 50,000	Tax Levy Borrowing
2018FATM	Library - Replace The Roof (Engineering)	\$ 50,000	Tax Levy Borrowing
2018FATM	Town Hall - Replace Roof (Engineering)	\$ 45,000	Tax Levy Borrowing

Fiscal Year	Description	Amount	Source
FY2020	Downtown Parking Garage	\$ 12,000,0	00 Tax Levy Borrowing
FY2020	NHS - Rebuild Memorial Field House	\$ 8,000,0	00 Tax Levy Borrowing
FY2020	North Ave Area Drainage Improvements	\$ 1,500,0	00 Tax Levy Borrowing
FY2020	Roads & Sidewalks (Collector/Arterial)	\$ 1,500,0	00 Tax Levy Borrowing
FY2020	Replace L-1 With A Platform/Ladder	\$ 1,400,0	00 Tax Levy Borrowing
FY2020	Engineering & Repairs To The Charles River Dam	\$ 1,250,0	00 Tax Levy Borrowing
FY2020	Memorial School - Replace Exterior Windows	\$ 1,200,0	00 Tax Levy Borrowing
FY2020	Roadway & Sidewalks Supplement	\$ 1,000,0	00 Tax Levy Borrowing
FY2020	Cole Recreation Center (Engineering)	\$ 850,0	00 Tax Levy Borrowing
FY2020	Replace Fire Pumper	\$ 620,0	00 Tax Levy Borrowing
FY2020	Building Addition 75 West Street	\$ 600,0	00 Tax Levy Borrowing
FY2020	Public Safety Building - Replace Roof	\$ 600,0	00 Tax Levy Borrowing
FY2020	Replace Synthetic Turf Memorial Field	\$ 600,0	00 Tax Levy Borrowing
FY2020	Library - Replace The Roof	\$ 500,0	00 Tax Levy Borrowing
FY2020	South Natick Multipurpose Court Renovation	\$ 500,0	00 Tax Levy Borrowing
FY2020	Town Hall - Replace Roof	\$ 450,0	00 Tax Levy Borrowing
FY2020	Replace S-101 Side Arm Recycling Truck	\$ 320,0	00 Tax Levy Borrowing
FY2020	Replace H-62 Street Sweeper	\$ 260,0	00 Tax Levy Borrowing
FY2020	Replace H-46 Truck/Sander	\$ 250,0	00 Tax Levy Borrowing
FY2020	Document Archiving	\$ 250,0	00 Tax Levy Borrowing
FY2020	Replace Bookmobile	\$ 200,0	00 Tax Levy Borrowing
FY2020	Replace H-67 Bombadier	\$ 200,0	00 Tax Levy Borrowing
FY2020	Memorial School Court Repairs	\$ 200,0	00 Tax Levy Borrowing

Fiscal Year	Description	Amount	Source		
FY2021	Cole Recreation Center	\$ 8,500,000	Tax Levy Borrowing		
FY2021	Roads & Sidewalks (Collector/Arterial)	\$ 1,500,000	Tax Levy Borrowing		
FY2021	Roadway & Sidewalks Supplement	\$ 1,000,000	Tax Levy Borrowing		
FY2021	Memorial-Install Fire Sprinkler System	\$ 650,000	Tax Levy Borrowing		
FY2021	Murphy Field Park Updates	\$ 600,000	Tax Levy Borrowing		
FY2021	Wilson - Install Second Floor Ac	\$ 500,000	Tax Levy Borrowing		
FY2021	Brown - Replace Boilers	\$ 400,000	Tax Levy Borrowing		
FY2021	Lilja - Replace Boilers	\$ 400,000	Tax Levy Borrowing		
FY2021	Replace S-102 Side Arm Recycling Truck	\$ 320,000	Tax Levy Borrowing		
FY2021	Morse Library - Replace 5 Ahu's	\$ 300,000	Tax Levy Borrowing		
FY2021	Replace Ambulance	\$ 275,000	Tax Levy Borrowing		
FY2021	Replacing H-49 Dump Truck/Sander	\$ 250,000	Tax Levy Borrowing		
FY2021	Tractor Trailer	\$ 225,000	Tax Levy Borrowing		

Fis cal Year	Description	Amount	Source
FY2022	Roads & Sidewalks (Collector/Arterial)	\$ 1,500,000	Tax Levy Borrowing
FY2022	Roadway & Sidewalks Supplement	\$ 1,000,000	Tax Levy Borrowing
FY2022	Replace 2005 Pumper	\$ 700,000	Tax Levy Borrowing
FY2022	Memorial - Resurface And Expand Parking Areas	\$ 400,000	Tax Levy Borrowing
FY2022	Replace 442 (Street Sweeper)	\$ 300,000	Tax Levy Borrowing
FY2022	Replace Public Works Backup Generator	\$ 250,000	Tax Levy Borrowing/WS Bor
FY2023	Roads & Sidewalks (Collector/Arterial)	\$ 1,500,000	Tax Levy Borrowing
FY2023	Roadway & Sidewalks Supplement	\$ 1,000,000	Tax Levy Borrowing
FY2023	Replace Rescue-3	\$ 550,000	Tax Levy Borrowing
FY2023	Henry Wilson Park Improvement	\$ 450,000	Tax Levy Borrowing
FY2023	NPS - New Elementary School	\$110,000,000	Debt Excluded Borrowing

# Five Year Capital Plan Capital Stabilization Fund

Capital Stabilization Fund										
\$ 2019 3,480,240	\$	2020 3,264,800	\$	2021 1,510,200	\$	2022 2,057,700	\$	2023 1,151,200		

# **Types of Payment Schedules**

- 1. Level Service Payment Repayment of bonds through a fixed number of fixed amount payments. Amount of each payment is the same however it is apportioned unequally between interest and principal payments.
  - **Pro** Constant payment schedules easier to budget -typically used in consumer mortgages
  - **Con** Increases amount of interest paid
- 2. Level Principal Payment Amount of principal payment remains relatively constant over the life of the issue of bonds, resulting in declining annual debt service payments as the amount of interest payments declines.
  - **Pro** Lower overall interest payments
  - **Con** Higher initial payments
- 3. **Hybrid Level Service Payments** –First five years are Level Service Payments then converts to Level Principal Payments for remainder of bond term.
  - **Pro** Initial level service payments provide constancy for tax payers in first five years
  - **Con** Increases interest payments still get rate increase in sixth year

	· · · · · ·			· · · · · · · · · · · · · · · · · · ·	Town of Natic	, Mass	ach	usetts						
				West Natick Fire Sta	ation - Amortized ove	r 20 yea	ars; E	Bonds Dat	ed C	ecember 1, 20	)18			
			[		Debt E	xclusio	n							
			Equal Princip	· · · · · · · · · · · · · · · · · · ·								Level Debt 20 y		
				Estimated Tax Rate	Est. Tax Impact								Estimated Tax Rate	Est Tax Impact
<u>FY</u>	<u>Principal</u>	<u>Interest</u>	<u>Total</u>	<u>Impact per \$1,000</u>	<u>per \$100,000</u>		_	<u>ncipal</u>		<u>Interest</u>		<u>Total</u>	<u>Impact per \$1,000</u>	<u>per \$100,000</u>
2020	778,000	748, 159	1, 526, 159	0.19	18.55	\$	r -	322,041	\$	748, 159		1,070, 199	0.13	13.01
2021	778,000	480, 415	1, 258, 415	0.15	15.29	\$		582,846	\$	487, 354		1,070, 199	0.13	13.01
2022	778,000	455, 130	1, 233, 130	0.15	14.99	\$	r	601,788	\$	468, 411	\$	1,070, 199	0.13	13.01
2023	778,000	429, 845	1, 207, 845	0.15	14.68	\$	5	621,346	\$	448, 853	\$	1,070, 199	0.13	13.01
2024	778,000	404, 560	1, 182, 560	0.14	14.37	\$		641,540	\$	428, 659	\$	1,070, 199	0.13	13.01
2025	778,000	379, 275	1, 157, 275	0.14	14.06	\$	5	662,390	\$	407, 809	\$	1,070, 199	0.13	13.01
2026	778,000	353, 990	1, 131, 990	0.14	13.76	\$	5	683,918	\$	386, 282	\$	1,070, 199	0.13	13.01
2027	778,000	328, 705	1, 106, 705	0.13	13.45	\$	\$	706,145	\$	364, 054	\$	1,070, 199	0.13	13.01
2028	778,000	303, 420	1, 081, 420	0.13	13.14	\$	5	729,095	\$	341, 105	\$	1,070, 199	0.13	13.01
2029	778,000	278, 135	1, 056, 135	0.13	12.83	\$	\$	752,790	\$	317, 409	\$	1,070, 199	0.13	13.01
2030	778,000	252, 850	1, 030, 850	0.13	12.53	Ş	\$	777,256	\$	292, 943	\$	1,070, 199	0.13	13.01
2031	778,000	227, 565	1, 005, 565	0.12	12.22	Ş	\$	802,517	\$	267, 683	\$	1,070, 199	0.13	13.01
2032	778,000	202, 280	980, 280	0.12	11.91	Ş	\$	828,599	\$	241, 601	\$	1,070, 199	0.13	13.01
2033	778,000	176, 995	954, 995	0.12	11.61	Ş	\$	855,528	\$	214,671	\$	1,070, 199	0.13	13.01
2034	778,000	151, 710	929, 710	0.11	11.30	\$	\$	883,333	\$	186, 867	\$	1,070, 199	0.13	13.01
2035	778,000	126, 425	904, 425	0.11	10.99	\$	\$	912,041	\$	158, 158	\$	1,070, 199	0.13	13.01
2036	778,000	101, 140	879,140	0.11	10.68	\$	\$	941,682	\$	128, 517	\$	1,070, 199	0.13	13.01
2037	778,000	75, 855	853, 855	0.10	10.38	\$	\$	972,287	\$	97, 912	\$	1,070, 199	0.13	13.01
2038	778,000	50, 570	828, 570	0.10	10.07	\$		003,886	\$	66, 313	\$	1,070, 199	0.13	13.01
2039	778,000	25, 285	803, 285	0.10	9.76	\$	\$ 1,	036,513	\$	33, 687	\$	1,070, 199	0.13	13.01
	15,560,000	5,552,309	21, 112, 309				15,	317,541		6,086,448		21,403,989		
-	imated at 3.25%													
	ed Valuation:		\$	8,229,002,220.00										
Long First C	oupon													

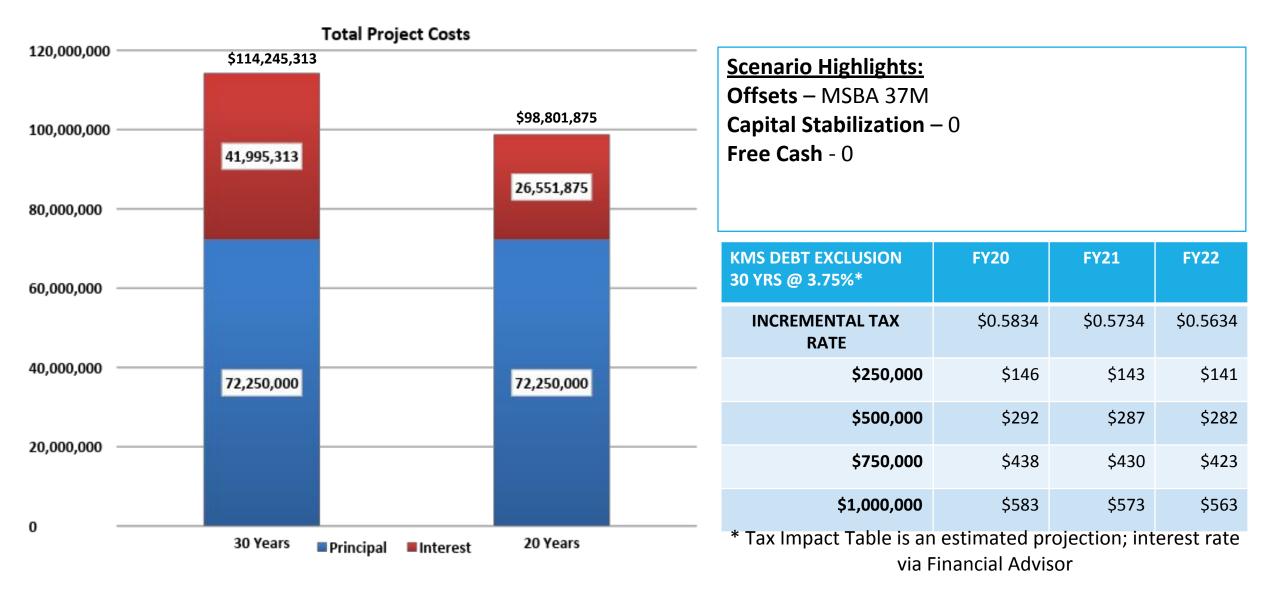
	v			·	Town of Natic	, Ma	ssachusetts	·				×	
				West Natick Fire Sta	tion - Amortized ove	r 25 y	ears; Bonds Da	ated	December 1, 2	018			
					DebtE	xclus	ion						
			Equal Principa	al 25 years				years					
				Estimated Tax Rate	Est. Tax Im pact			_				Estimated Tax Rate	Est. Tax Impact
<u>FY</u>	<u>Principal</u>	<u>Interest</u>	<u>Total</u>	<u>Im pact per \$1,000</u>	<u>per \$100,000</u>		<u>Principal</u>	_	<u>Interest</u>		<u>Total</u>	Impact per \$1,000	<u>per \$100,000</u>
2020	622,400	677,863	1,300,263	0.17	17.35		\$ 265,000	-		\$	942,863	0.11	11.46
2021	622,400	522,816	1,145,216	0.14	13.92		\$ 415,000		529,463		944,463	0.11	11.48
2022	622,400	501,032	1,123,432	0.14	13.65		\$ 430,000	_	514,675		944,675	0.11	11.48
2023	622,400	479,248	1,101,648	0.13	13.39		\$ 445,000		499,363		944,363	0.11	11.48
2024	622,400	457,464	1,079,864	0.13	13.12		\$ 460,000	\$	483,525		943,525	0.11	11.47
2025	622,400	435,680	1,058,080	0.13	12.86		\$ 475,000	1	467,163	\$	942,163	0.11	11.45
2026	622,400	413,896	1,036,296	0.13	12.59		\$ 495,000		450,188	\$	945,188	0.11	11.49
2027	622,400	392,112	1,014,512	0.12	12.33		\$ 510,000		432,600		942,600	0.11	11.45
2028	622,400	370,328	992,728	0.12	12.06		\$ 530,000		414,400	1	944,400	0.11	11.48
2029	622,400	348,544	970,944	0.12	11.80		\$ 550,000		395,500		945,500	0.11	11.49
2030	622,400	326,760	949,160	0.12	11.53		\$ 570,000		375,900	\$	945,900	0.11	11.49
2031	622,400	304,976	927,376	0.11	11.27		\$ 590,000	_	355,600	\$	945,600	0.11	11.49
2032	622,400	283,192	905,592	0.11	11.00		\$ 610,000		334,600		944,600	0.11	11.48
2033	622,400	261,408	883,808	0.11	10.74		\$ 630,000	-	312,900		942,900	0.11	11.46
2034	622,400	239,624	862,024	0.10	10.48		\$ 655,000	\$	290,413	\$	945,413	0.11	11.49
2035	622,400	217,840	840,240	0.10	10.21		\$ 680,000	\$	267,050	\$	947,050	0.12	11.51
2036	622,400	196,056	818,456	0.10	9.95		\$ 700,000	\$	242,900	\$	942,900	0.11	11.46
2037	622,400	174,272	796,672	0.10	9.68		\$ 725,000	\$	217,963	\$	942,963	0.11	11.46
2038	622,400	152,488	774,888	0.09	9.42		\$ 755,000	\$	192,063	\$	947,063	0.12	11.51
2039	622,400	130,704	753,104	0.09	9.15		\$ 780,000	\$	165,200	\$	945,200	0.11	11.49
2040	622,400	108,920	731,320	0.09	8.89		\$ 805,000	\$	137,463	\$	942,463	0.11	11.45
2041	622,400	87,136	709,536	0.09	8.62		\$ 835,000	\$	108,763	\$	943,763	0.11	11.47
2042	622,400	65,352	687,752	0.08	8.36		\$ 865,000	-	79,013	\$	944,013	0.11	11.47
2043	622,400	43,568	665,968	0.08	8.09		\$ 895,000	\$	48,213	\$	943,213	0.11	11.46
2044	622,400	21,784	644,184	0.08	7.83		\$ 930,000	\$	16,275	\$	946,275	0.11	11.50
	15,560,000	7,213,063	22,773,063				15,600,000		8,009,056		23,609,056		
								-					
	imated at 3.50%							-					
	sed Valuation:		\$	8,229,002,220.00				-					
Long First C	oupon												

# **Proiected Debt Costs**

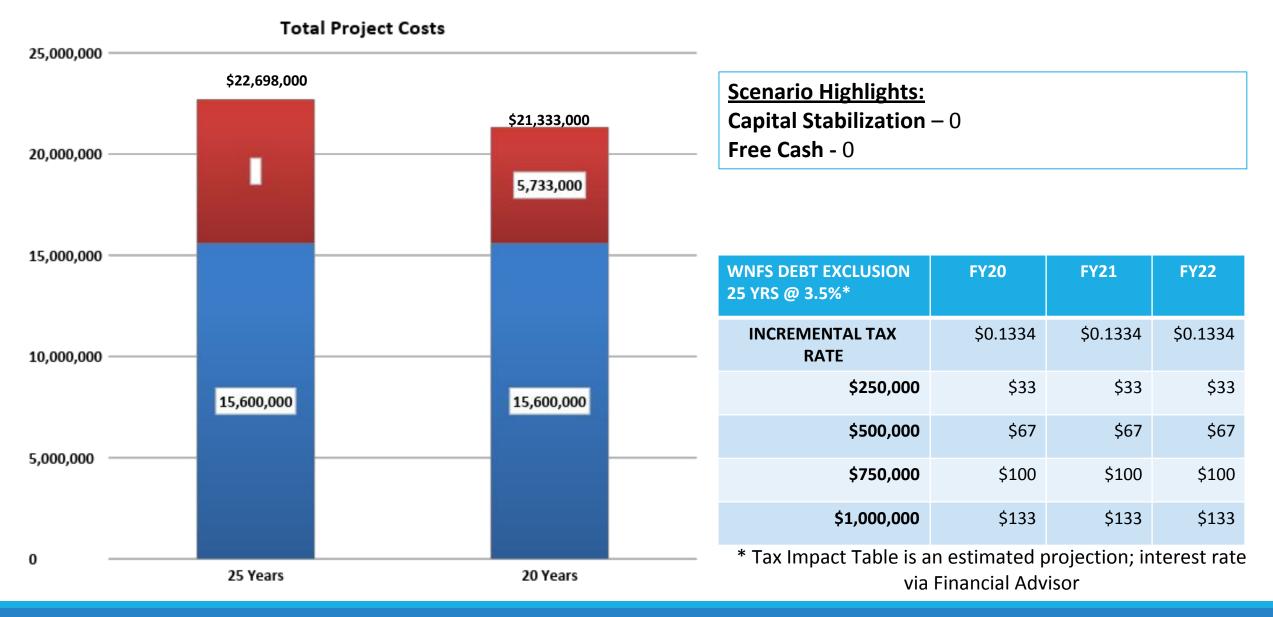
	Outstanding Debt				A	pproved Projects		Projected		
Fiscal Year		Excluded		W/I Levy		W/I Levy		Capital Request	T	fotal General Fund
2020	s	4,334,763	S	4,317,229	\$	1,353,538	s	534,689	s	10,540,219
2021	s	4,228,171	\$	3,474,168	\$	1,325,217	s	3,852,140	\$	12,879,696
2022	s	4,118,730	\$	2,966,399	\$	1,296,897	s	5,177,169	\$	13,559,195
2023	s	4,019,639	S	2,545,640	\$	1,268,576	s	5,939,079	\$	13,772,934
2024	s	3,918,068	S	2,296,942	\$	1,240,256	s	5,803,856	s	13,259,122
2025	s	3,283,696	\$	1,974,752	\$	1,196,935	s	5,531,552	\$	11,986,935
2026	s	3,194,884	S	1,529,702	\$	1,169,102	s	5,348,488	s	11,242,176
2027	s	3,105,128	S	1,217,921	\$	1,086,269	s	5,137,763	s	10,547,081
2028	s	3,003,197	S	1,125,182	\$	1,060,224	s	4,604,614	s	9,793,217
2029	s	2,901,266	\$	1,057,743	\$	1,034,178	\$	4,260,595	\$	9,253,782
2030	s	2,799,335	S	924,604	\$	988,133	s	3,945,450	s	8,657,522
2031	s	2,697,404	S	824,599	\$	962,737	s	3,824,538	s	8,309,278
2032	s	160,473	\$	733,027	\$	937,342	\$	3,702,506	\$	5,533,348
2033	s	155,753	S	509,978	\$	911,946	\$	3,602,975	s	5,180,652
2034			S	308,000	\$	886,551	s	3,503,444	s	4,697,994
2035			S	299,850	\$	326,480	s	3,183,913	\$	3,810,243
2036			S	216,700	\$	318,472	s	2,544,865	s	3,080,037
2037			S	161,425	\$	310,464	s	2,125,175	s	2,597,064
2038			5	116,725	\$	302,456	s	1,681,919	\$	2,101,100
2039					\$	294,448	s	1,632,113	s	1,926,561
2040					\$	286,440	s	1,582,306	S	1,868,746
2041					\$	278,432	s	425,000	s	703,432
2042					\$	270,424	s	-	s	270,424
2043					\$	262,416			s	262,416
2044					\$	254,408			\$	254,408
Total	\$	41,920,507	s	26,600,586	\$	19,622,338	\$	77,944,147	\$	166,087,578

\* This table excludes Fire Station 4 (West Natick) and the Kennedy Middle School

## Kennedy Middle School Financing – Debt Exclusion – Level Principal

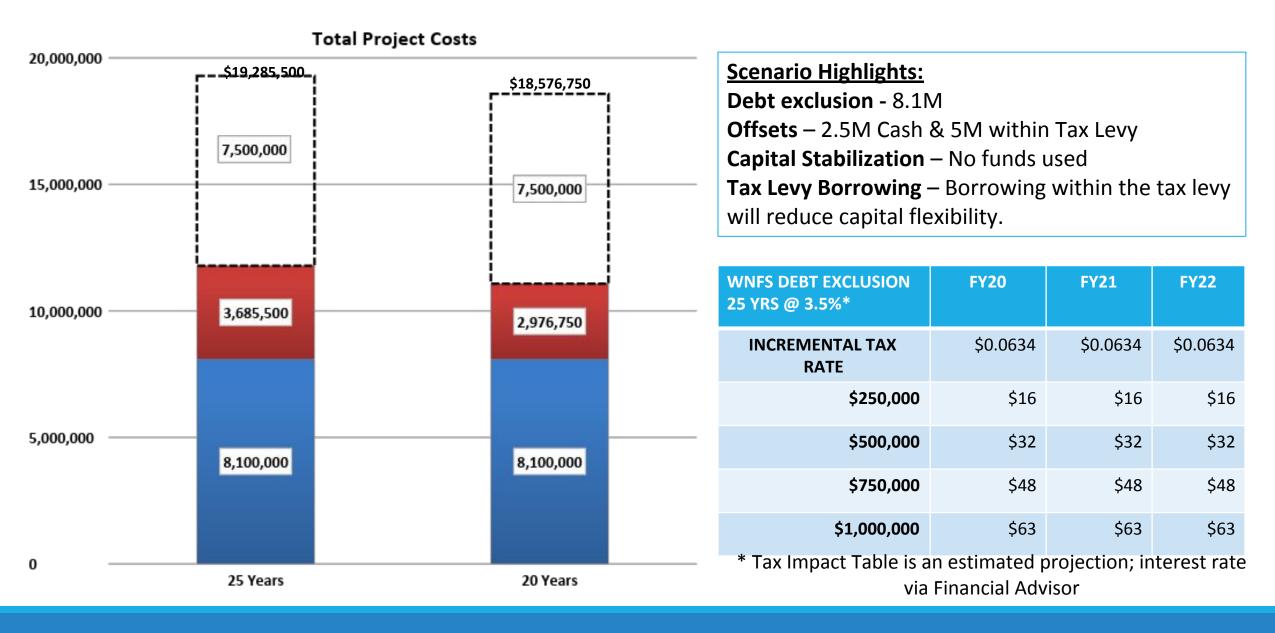


## West Natick Fire Station Financing – Debt Exclusion – Level Principal

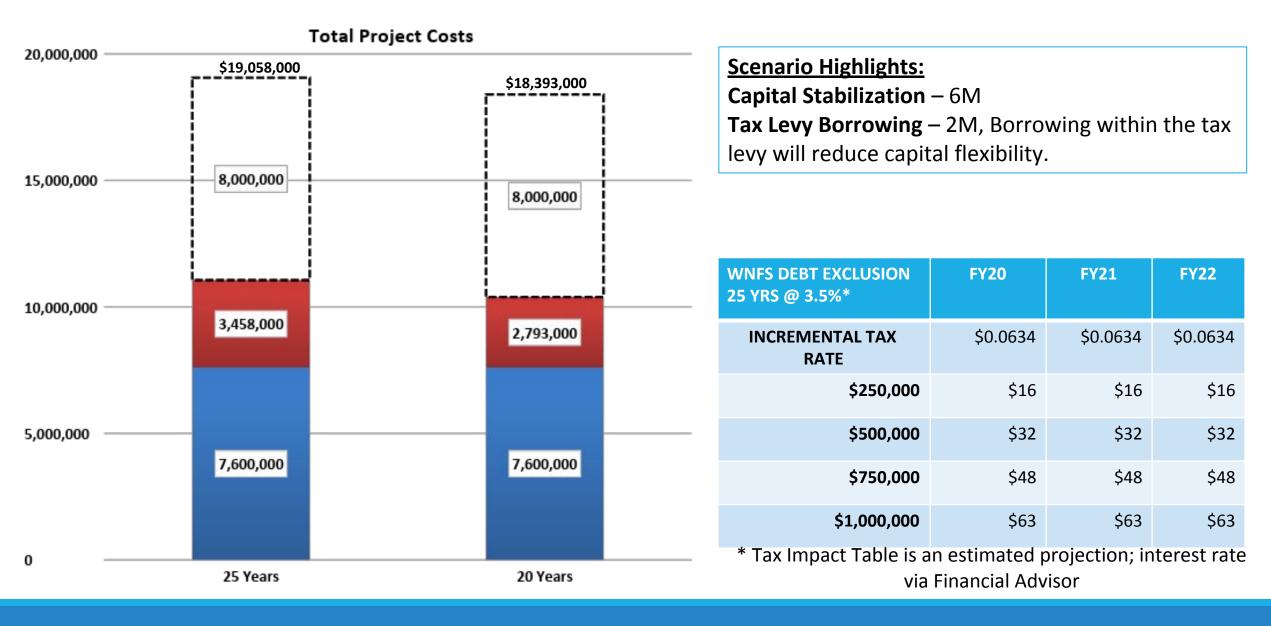


16

#### WNFS Financing – 5M Tax Levy Borrowing, 2.5M Cash, 8.1M debt exclusion – Level Principal



#### WNFS Financing – 6M Cap. Stabilization, 2M Tax Levy Borrowing, 7.6M debt exclusion – Level Principal



## KMS & WNFS Both Full Debt Exclusions KMS 30 Years @ 3.75% WNFS 25 Years @ 3.50% Level Service Payments with Potential Tax Impact

Plus \$72.250M School Bonds (see pages 10 & 11)	Est. School Debt Service Tax Rate Impact per \$1,000	Plus \$15.6M Fire Station Bonds (see pages 10 & 11)	Est. Fire Station Debt Service Tax Rate Impact per \$1,000
-	-	-	-
-	-		-
4,049,063	0.49	942,863	0.11
4,048,000	0.49	944,463	0.11
4,049,844	0.49	944,675	0.11
4,049,625	0.49	944,363	0.11
4,047,344	0.49	943,525	0.11
4,047,906	0.49	942,163	0.11
4,046,219	0.49	945,188	0.11
4,047,188	0.49	942,600	0.11
4,050,625	0.49	944,400	0.11
4,046,531	0.49	945,500	0.11
4,049,813	0.49	945,900	0.11
4,050,281	0.49	945,600	0.11
4,047,938	0.49	944,600	0.11
4,047,688	0.49	942,900	0.11
4,049,344	0.49	945,413	0.11
4,047,813	0.49	947,050	0.12
4,048,000	0.49	942,900	0.11
4,049,719	0.49	942,963	0.11
4,047,875	0.49	947,063	0.12
4,047,375	0.49	945,200	0.11
4,048,031	0.49	942,463	0.11
4,049,656 4,047,156	0.49	943,763 944,013	0.11
4,047,150	0.49	943,213	0.11
4,049,031	0.49	946,275	0.11
4,048,125	0.49	840,275	0.11
4,040,120	0.49	-	-
4,046,781	0.49		100
4.050.875	0.49		
4.049.531	0.49		
121,455,156	0.10	23,609,050	

DEBT EXCLUSION	FY20	FY21	FY22
INCREMENTAL TAX RATE	\$0.60	\$0.60	\$0.60
\$250,000	\$150	\$150	\$150
\$500,000	\$300	\$300	\$300
\$750,000	\$450	\$450	\$450
\$1,000,000	\$600	\$600	\$600

KMS \$72,250,000WNFS \$15,560,000Total Cost - \$144,524,206

## KMS & WNFS Both Full Debt Exclusions KMS 30 Years @ 3.75% WNFS 25 Years @ 3.50% Hybrid Model Level Service Payments with Potential Tax Impact

	Plus \$72.250M School Bonds (see pages 10 & 11)	Est. School Debt Service Tax Rate Impact per \$1,000	Plus \$15.6M Fire Station Bonds (see pages 10 & 11)	Est. Fire Station Debt Service Tax Rate Impact per \$1,000
t	-	1	_	_
1	-	-		-
1	4,049,063	0.49	942,863	0.11
1	4,048,000	0.49	944,463	0.11
1	4,049,844	0.49	944,675	0.11
1	4,049,625	0.49	944,363	0.11
1	4,047,344	0.49	943,525	0.11
1	5,043,875	0.61	1,143,575	0.14
1	4,945,250	0.60	1,119,775	0.14
1	4,846,625	0.59	1,095,975	0.13
1	4,748,000	0.58	1,072,175	0.13
1	4,649,375	0.56	1,048,375	0.13
1	4,550,750	0.55	1,024,575	0.12
1	4,452,125 4,353,500	0.53	1,000,775 976,975	0.12
1	4,254,875	0.52	953,175	0.12
1	4,156,250	0.51	929,375	0.12
1	4,057,625	0.49	905,575	0.11
1	3,959,000	0.48	881,775	0.11
1	3,855,469	0.47	857,975	0.10
1	3,757,031	0.46	834,175	0.10
1	3,658,594	0.44	810,375	0.10
1	3,560,156	0.43	786,575	0.10
1	3,461,719	0.42	762,775	0.09
1	3,363,281	0.41	734,063	0.09
1	3,264,844	0.40	710,438	0.09
1	3,166,406	0.38	686,813	0.08
	3,067,969	0.37	-	-
	2,969,531	0.36	-	-
	2,871,094	0.35	-	-
1	2,772,656	0.34	-	-
ł	2,674,219	0.32	-	-
L	116,704,094		23,055,175	

DEBT EXCLUSION	FY20	FY21	FY25 Hybrid
INCREMENTAL TAX RATE	\$0.60	\$0.60	\$0.75
\$250,000	\$150	\$150	\$187.50
\$500,000	\$300	\$300	\$375.00
\$750,000	\$450	\$450	\$562.50
\$1,000,000	\$600	\$600	\$750.00

KMS \$72,250,000 WNFS \$15,560,000 Total Cost - \$139,759,269

# KMS Full Debt Exclusion & WNFS \$10,000,000 Debt ExclusionKMS 30 Years @ 3.75% WNFS 25 Years @ 3.50%Level Service Payments with Potential Tax Impact

\$5.6M, 25 YEARS @ 3.5% WITHIN TAX LEVY IMPACT			Tax Payer Tax Bill Impact				
Final year	Debt Service	Value of Projects	DEBT EXCLUSION: KMS & WNFS	FY20	FY21	FY22	
Fiscal year	Debt Service	\$5.6M spent within the tax levy would potentially defer \$4.2M worth of projects over the	INCREMENTAL TAX RATE	\$0.56	\$0.56	\$0.56	
2020	\$420,000		within the tax levy would potentially defer \$4.2M worth of projects over the	\$250,000	\$140	\$140	\$140
2021	\$412,160			\$500,000	\$280	\$280	\$280
2022	\$404,320			\$750,000	\$420	\$420	\$420
2023	\$396,480	first 5 years	\$1,000,000	\$560	\$560	\$560	

Total Tax Levy Cost -\$8,148,000 KMS \$72,250,000WNFS \$10,000,000Total Cost - \$136,590,006

## KMS Full Debt Exclusion & WNFS \$10,000,000 Debt Exclusion KMS 30 Years @ 3.75% WNFS 25 Years @ 3.50% Hybrid Model Level Service Payments with Potential Tax Impact

Plus \$72.250M School Bonds (see pages 10 & 11)	Est. School Debt Service Tax Rate Impact per \$1,000	Plus \$10M Fire Station Bonds (see pages 10 & 11)	Est. Fire Station Debt Service Tax Rate Impact per \$1,000
			-
-	-	-	-
4,049,063	0.49	604,525	0.07
4,048,000	0.49	604,413	0.07
4,049,844	0.49	604,963	0.07
4,049,625	0.49	605,163	0.07
4,047,344	0.49	605,013	0.07
5,043,875	0.61	737,150	0.09
4,945,250	0.60	721,750	0.09
4,846,625	0.59	701,438	0.09
4,748,000	0.56	686,213	0.08
4,649,375 4,550,750	0.55	670,988 655,763	0.08
4,550,750	0.54	640,538	0.08
4,452,125	0.53	625,313	0.08
4,254,875	0.52	610,088	0.07
4,156,250	0.51	594,863	0.07
4.057.625	0.49	579,638	0.07
3,959,000	0.48	564,413	0.07
3,855,469	0.47	549,188	0.07
3,757,031	0.46	533,963	0.06
3.658.594	0.44	518,738	0.06
3,560,156	0.43	503,513	0.06
3,461,719	0.42	488,288	0.06
3,363,281	0.41	473,063	0.06
3.264.844	0.40	457,838	0.06
3,166,406	0.38	442,613	0.05
3,067,969	0.37		-
2,969,531	0.36	-	-
2,871,094	0.35	-	-
2,772,656	0.34		-
2,674,219	0.32	-	
116,704,094		14,779,425	

DEBT EXCLUSION	FY20	FY21	FY25 Hybrid
INCREMENTAL TAX RATE	\$0.56	\$0.56	\$0.70
\$250,000	\$140	\$140	\$175
\$500,000	\$280	\$280	\$350
\$750,000	\$420	\$420	\$525
\$1,000,000	\$560	\$560	\$700

KMS \$72,250,000WNFS \$10,000,000Total Cost - \$131,483,519

## KMS Full Debt Exclusion & WNFS \$7,800,000 Debt Exclusion KMS 30 Years @ 3.75% WNFS 25 Years @ 3.50% Level Service Payments with Potential Tax Impact

\$7.8M, 25 YEARS @ 3.5% WITHIN TAX LEVY IMPACT		DEBT EXCLUSION	FY20	FY21	FY22	
Fiscal year	Debt Service	Value of Projects Deferred	INCREMENTAL TAX RATE	\$0.55	\$0.55	\$0.55
2020	\$585,000	\$7.8M spent within the tax	\$250,000	\$137.50	\$137.50	\$137.50
2021	\$574,080	levy would potentially defer	\$500,000	\$275.00	\$275.00	\$275.00
2022	\$563,160	\$6.1M worth of projects over the	\$750,000	\$412.50	\$412.50	\$412.50
2023	\$552,240	first 5 years	\$1,000,000	\$550.00	\$550.00	\$550.00

Total Tax Levy Cost -\$11,349,000 KMS \$72,250,000WNFS \$7,800,000Total Cost - \$131,261,606

## Debt Exclusions Hybrid Financing: KMS 30 years @ 3.75% and WNFS 25 Years @3.5% Potential Tax Impact

BOTH DEBT EXCLUSION	FY20	FY21	FY25
INCREMENTAL TAX RATE	\$0.64	\$0.62	\$0.75
\$250,000	\$160	\$155	\$188
\$500,000	\$320	\$310	\$375
\$750,000	\$480	\$465	\$563
\$1,000,000	\$640	\$620	\$750

## Summary of Scenario Costs

Description	KMS Debt Excl	KMS Debt Cost	Terms	WNFS Debt Excl	WNFS Other Funds	WNFS Debt Cost	Terms	Total Debt Cost	
Level Payment Both Projects Excluded	\$ 72,250,000	\$ 121,455,156	30 years @3.75%	\$ 15,600,000	\$-	\$ 23,069,050	25 years @ 3.5%	\$ 144,524,206	
Level Principal Both Projects Excluded	\$ 72,250,000	\$ 114,221,875	30 years @3.75%	\$ 15,600,000	\$-	\$ 22,698,000	25 years @ 3.5%	\$ 136,919,875	
Level Principal Both Projects Excluded	\$ 72,250,000	\$ 107,471,875	25 years @3.75%	\$ 15,600,000	\$-	\$ 22,698,000	25 years @ 3.5%	\$ 130,169,875	
Hybrid Both Projects Excluded	\$ 72,250,000	\$ 116,704,094	30 years @3.75%	\$ 15,600,000	\$-	\$ 23,055,175	25 years @ 3.5%	\$ 139,759,269	
Level Payment Both Projects Excluded - WNFS \$10M	\$ 72,250,000	\$ 121,455,156	30 years @3.75%	\$ 10,000,000	\$ 5,600,000	\$ 15,134,850	25 years @ 3.5%	\$ 136,590,006	
Hybrid Both Projects Excluded - WNFS \$10M	\$ 72,250,000	\$ 116,704,094	30 years @3.75%	\$ 10,000,000	\$ 5,600,000	\$ 14,779,425	25 years @ 3.5%	\$ 131,483,519	
Level Payment Both Projects Excluded - WNFS \$7.8M	\$ 72,250,000	\$ 121,455,156	30 years @3.75%	\$ 7,800,000	\$ 7,800,000	\$ 11,806,450	25 years @ 3.5%	\$ 133,261,606	
Hybrid Both Projects Excluded - WNFS \$7.8M	\$ 72,250,000	\$ 116,704,094	30 years @3.75%	\$ 7,800,000	\$ 7,800,000	\$ 11,529,075	25 years @ 3.5%	\$ 128,233,169	

## QUESTIONS?

#### Town of Natick General Fund Projected Debt Service

#### Approved

Authorization	Description	Amo	ount	<b>Project Status</b>	Borrowing Status
2016SATM29	22 Pleasant Street Land Acquisition	\$	3,200,000	Negotiating	None
2016SPEC3	CRT Land Acquisition	\$	2,960,000	Purchase Complete	Bond Anticipation Note (due Dec 2018)
2018SATM13C1	Replace S-5 Fire Alarm and Signal Bucket Truck	\$	200,000	Preliminary Quotes	None
2018SATM14B1	Engineering & Repairs To The Charles River Dam	\$	675,000	Engineering Review	None
2018SATM14B2	Roadway & Sidewalks Supplement	\$	1,000,000	Progressing	Bond Anticipation Note (\$350,000 due Dec 2018)
2018SATM14B3	Roadway Improvements Washington Avenue	\$	2,500,000	Progressing	Bond Anticipation Note (\$75,000 due Dec 2018)
2017FATM9C7	Replace SCBA Equipment	\$	350,000	Ordering	Bond Anticipation Note (due Dec 2018)
2017FATM10B3	East Field Renovations	\$	2,535,000	Bids Received	None - Designed under separate appropriation
2017FATM10B4	Navy Yard Field Renovations	\$	1,600,000	Bids Received	None - Designed under separate appropriation
2018SPEC1	Kennedy Middle School	\$	109,560,000	CD Phase	Bond Anticipation Note (\$2,975,000 due Dec 2018)

#### Capital Budget (2018 FATM Consideration)

Plan Approval	Description	Amou	int	Project Status	<b>Borrowing Status</b>
2018FATM	Replace Fire Station 4 (West Natick)	\$	15,560,000	Scheduled 2018 FATM	None
2018FATM	Construction - Roadway Improvements South Main St.	\$	3,000,000	Scheduled 2018 FATM	None
2018FATM	Replacing S-34 Trash Packer	\$	305,000	Scheduled 2018 FATM	None
2018FATM	North Ave Area Drainage Improvements	\$	300,000	Scheduled 2018 FATM	None
2018FATM	Replace H-43 Truck/Sander	\$	250,000	Scheduled 2018 FATM	None
2018FATM	Replace H-70 Trackless	\$	250,000	Scheduled 2018 FATM	None
2018FATM	Memorial Sch - Replace Exterior Windows (Engineering)	\$	120,000	Scheduled 2018 FATM	None
2018FATM	Building Addition 75 West Street (Engineering)	\$	60,000	Scheduled 2018 FATM	None
2018FATM	Public Safety Building - Replace Roof (Engineering)	\$	50,000	Scheduled 2018 FATM	None
2018FATM	Library - Replace The Roof (Engineering)	\$	50,000	Scheduled 2018 FATM	None
2018FATM	Town Hall - Replace Roof (Engineering)	\$	45,000	Scheduled 2018 FATM	None

#### Capital Requests Presented to Administration (Further analysis, discussion & vetting required)

<b>Fiscal Year</b>	Description	Amo		<b>Project Status</b>	<b>Borrowing Status</b>
FY2020	Downtown Parking Garage	\$	12,000,000	Under Review	None
FY2020	NHS - Rebuild Memorial Field House	\$	8,000,000	Under Review	None
FY2020	North Ave Area Drainage Improvements	\$	1,500,000	Under Review	None
FY2020	Roads & Sidewalks (Collector/Arterial)	\$	1,500,000	Under Review	None
FY2020	Replace L-1 With A Platform/Ladder	\$	1,400,000	Under Review	None
FY2020	Engineering & Repairs To The Charles River Dam	\$	1,250,000	Under Review	None
FY2020	Memorial School - Replace Exterior Windows	\$	1,200,000	Under Review	None
FY2020	Roadway & Sidewalks Supplement	\$	1,000,000	Under Review	None
FY2020	Cole Recreation Center (Engineering)	\$	850,000	Under Review	None

#### Town of Natick General Fund Projected Debt Service

Fiscal Year	Description	Amou	nt	<b>Project Status</b>	Borrowing Status
FY2020	Replace Fire Pumper	\$	620,000	Under Review	None
FY2020	Building Addition 75 West Street	\$	600,000	Under Review	None
FY2020	Public Safety Building - Replace Roof	\$	600,000	Under Review	None
FY2020	Replace Synthetic Turf Memorial Field	\$	600,000	Under Review	None
FY2020	Library - Replace The Roof	\$	500,000	Under Review	None
FY2020	South Natick Multipurpose Court Renovation	\$	500,000	Under Review	None
FY2020	Town Hall - Replace Roof	\$	450,000	Under Review	None
FY2020	Replace S-101 Side Arm Recycling Truck	\$	320,000	Under Review	None
FY2020	Replace H-62 Street Sweeper	\$	260,000	Under Review	None
FY2020	Replace H-46 Truck/Sander	\$	250,000	Under Review	None
FY2020	Document Archiving	\$	250,000	Under Review	None
FY2020	Replace Bookmobile	\$	200,000	Under Review	None
FY2020	Replace H-67 Bombadier	\$	200,000	Under Review	None
FY2020	Memorial School Court Repairs	\$	200,000	Under Review	None
FY2021	Cole Recreation Center	\$	8,500,000	Under Review	None
FY2021	Roads & Sidewalks (Collector/Arterial)	\$	1,500,000	Under Review	None
FY2021	Roadway & Sidewalks Supplement	\$	1,000,000	Under Review	None
FY2021	Memorial-Install Fire Sprinkler System	\$	650,000	Under Review	None
FY2021	Murphy Field Park Updates	\$	600,000	Under Review	None
FY2021	Wilson - Install Second Floor Ac	\$	500,000	Under Review	None
FY2021	Brown - Replace Boilers	\$	400,000	Under Review	None
FY2021	Lilja - Replace Boilers	\$	400,000	Under Review	None
FY2021	Replace S-102 Side Arm Recycling Truck	\$	320,000	Under Review	None
FY2021	Morse Library - Replace 5 Ahu's	\$	300,000	Under Review	None
FY2021	Replace Ambulance	\$	275,000	Under Review	None
FY2021	Replacing H-49 Dump Truck/Sander	\$	250,000	Under Review	None
FY2021	Tractor Trailer	\$	225,000	Under Review	None
FY2022	Roads & Sidewalks (Collector/Arterial)	\$	1,500,000	Under Review	None
FY2022	Roadway & Sidewalks Supplement	\$	1,000,000	Under Review	None
FY2022	Replace 2005 Pumper	\$	700,000	Under Review	None
FY2022	Memorial - Resurface And Expand Parking Areas	\$	400,000	Under Review	None
FY2022	Replace 442 (Street Sweeper)	\$	300,000	Under Review	None
FY2022	Replace Public Works Backup Generator	\$	250,000	Under Review	None
FY2023	Roads & Sidewalks (Collector/Arterial)	\$	1,500,000	Under Review	None
FY2023	Roadway & Sidewalks Supplement	\$	1,000,000	Under Review	None
FY2023	Replace Rescue-3	\$	550,000	Under Review	None
FY2023	Henry Wilson Park Improvement	\$	450,000	Under Review	None
FY2023	NPS - New Elementary School		\$1	Under Review	None

	Town of Natick								
Capital Stabilization Fund									
2019 2020 2021 2022 2023 Source									
Modulars Kennedy Middle School	\$	455,000	\$-	\$	- \$	5 - \$	- Capital Stabilization Fund		
Memorial Field Parking Lot Repair And Improvement	\$	350,000	\$-	\$	- \$	s - \$	- Capital Stabilization Fund		
Park And Field Renovations	\$	175,000	\$ 175,000	\$ 175,0	00 \$	\$	175,000 Capital Stabilization Fund		
Upgrade Garage Equipment	\$	150,000	\$ 30,000	\$ 30,0	00 \$	s - \$	- Capital Stabilization Fund		
Energy Efficiency	\$	150,000	\$-	\$	- \$	s - \$	- Capital Stabilization Fund		
Replace LF-5 Hook-Lift Truck	\$	140,000	\$-	\$	- \$	5 - \$	- Capital Stabilization Fund		
Wilson School - Install ADA Ramp	\$	125,000	\$-	\$	- \$	5 - \$	- Capital Stabilization Fund		
Document Storage Systems	\$	100,000	\$ 100,000	\$ 100,0	00 \$	5 - \$	- Capital Stabilization Fund		
Preservation Of Historical Records	\$	100,000	\$-	\$	- \$	s - \$	- Capital Stabilization Fund		
Brown School - Replace Classroom Carpet With Tile	\$	100,000	\$-	\$	- \$	s - \$	- Capital Stabilization Fund		
Incident Support Vehicle/Box Truck	\$	90,000	\$-	\$	- \$	5 - \$	- Capital Stabilization Fund		
Community Center Park Updates	\$	80,000	\$-	\$	- \$	5 - \$	- Capital Stabilization Fund		
Johnson - Replace Second Floor Classroom Tile	\$	70,000	\$-	\$	- \$	5 - \$	- Capital Stabilization Fund		
Memorial - Replace 32 Exhaust Fans	\$	65,000	\$-	\$	- \$	5 - \$	- Capital Stabilization Fund		
Memorial - Replace Front Entrance Sidewalk	\$	65,000	\$-	\$	- \$	s - \$	- Capital Stabilization Fund		
Replace LF-4 Pickup Truck	\$	65,000	\$-	\$	- \$	5 - \$	- Capital Stabilization Fund		
Replace Backup Power Generator Station 2	\$	65,000	\$-	\$	- \$	s - \$	- Capital Stabilization Fund		
Public Safety - Replace Carpeting Throughout	\$	60,000	\$-	\$	- \$	5 - \$	- Capital Stabilization Fund		
Wilson - Install 35 Classroom Projectors	\$	55,000	\$-	\$	- \$	s - \$	- Capital Stabilization Fund		
Replace Equipment Maintenance Garage Doors	\$	55,000	\$-	\$	- \$	s - \$	- Capital Stabilization Fund		
Air Compressor Replacement	\$	55,000	\$-	\$	- \$	5 - \$	- Capital Stabilization Fund		
Lilja School - Purchase Classroom FFE	\$	50,000	\$-	\$	- \$	s - \$	- Capital Stabilization Fund		
Johnson School - Replace Exterior Doors	\$	50,000	\$-	\$	- \$	5 - \$	- Capital Stabilization Fund		
Replace E-2 Engineering Survey Vehicle	\$	46,000	\$-	\$	- \$	5 - \$	- Capital Stabilization Fund		
Johnson - Paint Classroom Walls And Ceilings	\$	40,000	\$-	\$	- \$	s - \$	- Capital Stabilization Fund		
Lilja - Replace Bathroom Partitions And Sinks	\$	40,000	\$-	\$	- \$	s - \$	- Capital Stabilization Fund		
Fire Station 1 - Refurbish The Kitchen	\$	40,000	\$-	\$	- \$	5 - \$	- Capital Stabilization Fund		
Ben-Hem Replace Bathroom Partitions	\$	40,000	\$-	\$	- \$	5 - \$	- Capital Stabilization Fund		
EOC/Training Center Av Upgrade	\$	40,000	\$-	\$	- \$	s - \$	- Capital Stabilization Fund		
Library - Replace Chilled Water Supply Lines	\$	35,000	\$-	\$	- \$	5 - \$	- Capital Stabilization Fund		
Tree Replacement	\$	30,000	\$ 30,000	\$ 30,0	00 \$	\$ 30,000 \$	30,000 Capital Stabilization Fund		
Pole Pads For Voter Checkin And Checkout Rpocessing	\$	30,000	\$-	\$	- \$	s - \$	- Capital Stabilization Fund		
Ben Hem - Replace Toilets	\$	30,000	\$-	\$	- \$	s - \$	- Capital Stabilization Fund		
Town Hall - Renovate Town Hall Offices	\$	25,000	\$ 75,000	\$	- \$	5 - \$	-		
Brown - Create Three Small Rooms	\$	25,000		\$	- \$		-		
High School - Purchase New Furniture	\$	25,000		\$	- \$		-		
Replace LF-17 Lawn Mower	\$	25,000		\$	- \$	5 - \$	-		
Brown - Install Ac Inside The Art And Music Rooms	\$	20,000		\$	- \$	5 - \$	-		
Brown - Reconfigure Bathroom Entrance	\$	20,000		\$	- \$		-		

		Town	n of Natick					
Capital Stabilization Fund								
		2019	2020	2021	2022	2023 Source		
Johnson - Rehab Two Office Bathrooms	\$	20,000 \$	- \$	- \$	5 - Ş	<ul> <li>Capital Stabilization Fund</li> </ul>		
Replace Variable Message Boards	\$	17,250 \$	- \$	- \$	- \$	- Capital Stabilization Fund		
Seeding Equipment	\$	16,500 \$	- \$	- \$	- \$	- Capital Stabilization Fund		
Replace Dumpsters	\$	15,000 \$	17,500 \$	19,000 \$	5         20,500   \$	22,000 Capital Stabilization Fund		
Ben-Hem Repair Exterior Storage Room	\$	15,000 \$	- \$	- \$	- \$	- Capital Stabilization Fund		
Lilja - Install AC In The Gym	\$	15,000 \$	- \$	- \$	- \$	- Capital Stabilization Fund		
Replace Equipment Trailers	\$	15,000 \$	- \$	- \$	- \$	<ul> <li>Capital Stabilization Fund</li> </ul>		
Purchase Additional Auto Pulse/ Automated Cpr	\$	13,000 \$	- \$	- \$	- \$	- Capital Stabilization Fund		
Replace Comparator And 8 Voting Modules	\$	12,490 \$	- \$	- \$	- \$	- Capital Stabilization Fund		
Guardrail (Various Locations)	\$	10,000 \$	12,000 \$	14,000 \$	5 16,000 \$	18,000 Capital Stabilization Fund		
Tree Inventory	\$	10,000 \$	10,000 \$	10,000 \$	5 10,000 \$	- Capital Stabilization Fund		
Brown School - Install AC In The Cafeteria	\$	10,000 \$	- \$	- \$	- \$	- Capital Stabilization Fund		
Memorial - Install AC Conference Room	\$	10,000 \$	- \$	- \$	- \$	- Capital Stabilization Fund		
Wilson - Teachers Room Floor Replacement	\$	10,000 \$	- \$	- \$	- \$	- Capital Stabilization Fund		
NHS - Purchase Additional Storage Lockers	\$	10,000 \$	- \$	- \$	- \$	- Capital Stabilization Fund		
NHS Athletics - Install Water Bubbler / Ice Maker	\$	10,000 \$	- \$	- \$	- \$	- Capital Stabilization Fund		
Dive Team Equipment	\$	8,800 \$	- \$	- \$	- \$	- Capital Stabilization Fund		
Replace Laptop Computers	\$	6,200 \$	6,200 \$	6,200 \$	6,200 \$	6,200 Capital Stabilization Fund		
NHS IT Upgrades - Replace Switches	\$	- \$	200,000 \$	200,000 \$	100,000 \$	- Capital Stabilization Fund		
Old Town Park Circlulation Improvements	\$	- \$	175,000 \$	- \$	; - \$	- Capital Stabilization Fund		
Morse Library - Replace Carpeting	\$	- \$	150,000 \$	- \$	; - \$	- Capital Stabilization Fund		
NHS It Upgrades - Network Storage	\$	- \$	150,000 \$	- \$	; - \$	- Capital Stabilization Fund		
High School - Parking Lot Cameras	\$	- \$	150,000 \$	- \$	; - \$	- Capital Stabilization Fund		
Rehab Jennings Pond Dam	\$	- \$	150,000 \$	- \$	; - \$	- Capital Stabilization Fund		
Bacon Free Library Window Upgrade	\$	- \$	150,000 \$	- \$	; - \$	- Capital Stabilization Fund		
Kennedy- Replace Exterior Doors	\$	- \$	140,000 \$	- \$	; - \$	- Capital Stabilization Fund		
Replace H-40 Dump Truck	\$	- \$	135,000 \$	- \$	; - \$	- Capital Stabilization Fund		
Wilson - Replace Library Carpet, Furniture, Paint	\$	- \$	125,000 \$	- \$	; - \$	- Capital Stabilization Fund		
NHS It Upgrades - Firewall	\$	- \$	100,000 \$	- \$	; - \$	- Capital Stabilization Fund		
New Voting Machines	\$	- \$	75,000 \$	- \$	; - \$	- Capital Stabilization Fund		
Memorial - Paint Classroom Walls	\$	- \$	75,000 \$	- \$	; - \$	- Capital Stabilization Fund		
Johnson - Retile Ground Floor Classroom	\$	- \$	70,000 \$	- \$	; - \$	- Capital Stabilization Fund		
Replace LF-2 Pickup	\$	- \$	65,000 \$	- \$	; - \$	- Capital Stabilization Fund		
Ben-Hem - Convert The Second Boiler To Gas	\$	- \$	50,000 \$	- \$	5 - \$	- Capital Stabilization Fund		
Brown - Install New Rubber Flooring	\$	- \$	50,000 \$	- \$	; - \$	- Capital Stabilization Fund		
Replace E-3 Utility Vehicle	\$	- \$	46,000 \$	- \$	5 - \$	- Capital Stabilization Fund		
Memorial School - Replace Concrete Entrance Way	\$	- \$	45,000 \$	- \$	; - \$	- Capital Stabilization Fund		
Kennedy - Replace Admin Office Carpet	\$	- \$	45,000 \$	- \$	5 - \$	- Capital Stabilization Fund		
Raingarden 157 North Main Street - Murphy Field	\$	- \$	44,700 \$	- \$	- \$	- Capital Stabilization Fund		

		Town	of Natick				
Capital Stabilization Fund							
	20	19	2020	2021	2022	2023	Source
Lilja School - Security Cameras/ Door Controls	\$	- \$	40,000 \$	-	\$-	\$	- Capital Stabilization Fund
Johnson School - Retile Second Floor Hallway	\$	- \$	40,000 \$	-	\$-	\$	- Capital Stabilization Fund
Ben Hem - Paint Second Floor Classroom Walls	\$	- \$	40,000 \$	-	\$-	\$	- Capital Stabilization Fund
Lilja - Replace Hallway Walls With Drywall	\$	- \$	40,000 \$	-	\$-	\$	- Capital Stabilization Fund
Memroial - Replace Bathroom Partitions	\$	- \$	40,000 \$	-	\$-	\$	- Capital Stabilization Fund
Memorial - Replace Office Carpet And Classroom Vct	\$	- \$	40,000 \$	-	\$-	\$	- Capital Stabilization Fund
Brown - Install Security Cameras	\$	- \$	40,000 \$	-	\$-	\$	- Capital Stabilization Fund
Replace Health-1	\$	- \$	40,000 \$	-	\$-	\$	- Capital Stabilization Fund
Mary Bunker Park Support Building	\$	- \$	40,000 \$	-	\$-	\$	- Capital Stabilization Fund
Bioretention Area 157 North Main - Murphy Field	\$	- \$	35,400 \$	-	\$-	\$	- Capital Stabilization Fund
Kennedy - Security Cameras	\$	- \$	35,000 \$	-	\$-	\$	- Capital Stabilization Fund
Replace Maintenance Truck	\$	- \$	35,000 \$	-	\$-	\$	- Capital Stabilization Fund
Ben-Hem Replace Admin Office Rug	\$	- \$	30,000 \$	-	\$-	\$	- Capital Stabilization Fund
Public Safety Building - Replace Windows Glazing	\$	- \$	30,000 \$	-	\$-	\$	- Capital Stabilization Fund
Natick Fire Department Tree Filters	\$	- \$	25,000 \$	-	\$-	\$	- Capital Stabilization Fund
Wilson - Clean All Hvac Ducts	\$	- \$	25,000 \$	-	\$-	\$	- Capital Stabilization Fund
Fire Station 1 - Replace Roof Deck	\$	- \$	25,000 \$	-	\$-	\$	- Capital Stabilization Fund
Morse Library - Replace Exhaust Louvers With Doors	\$	- \$	25,000 \$	-	\$-	\$	- Capital Stabilization Fund
Ben-Hem Exterior Masonry Repair	\$	- \$	20,000 \$	-	\$-	\$	- Capital Stabilization Fund
Library - Replace Exterior Doors	\$	- \$	15,000 \$	-	\$-	\$	- Capital Stabilization Fund
Police Station - Add Additional Heat To The Garage	\$	- \$	15,000 \$	-	\$-	\$	- Capital Stabilization Fund
Police Dept Add Door To Conference Room	\$	- \$	10,000 \$	-	\$-	\$	- Capital Stabilization Fund
NHS Preschool - Install Classroom Connecting Door	\$	- \$	8,000 \$	-	\$-	\$	- Capital Stabilization Fund
Ben Hem - Expand Parking Lot And Resurface	\$	- \$	- \$	150,000	\$-	\$	- Capital Stabilization Fund
Brown - Convert Lobby To The Main Office	\$	- \$	- \$	150,000	\$-	\$	- Capital Stabilization Fund
Implementation Of Gravel Pit Master Plan	\$	- \$	- \$	125,000	\$-	\$	- Capital Stabilization Fund
High School - Build A Classroom Inside The Library	\$	- \$	- \$	100,000	\$-	\$	- Capital Stabilization Fund
Town Hall Main Entrance Repairs	\$	- \$	- \$	85,000	\$-	\$	- Capital Stabilization Fund
Replace M-3 2008 Emd Pickup Truck	\$	- \$	- \$	55,000	\$-	\$	- Capital Stabilization Fund
Ben Hem - Paint First Floor Classroom Walls	\$	- \$	- \$	50,000	\$-	\$	- Capital Stabilization Fund
Replace Vehicle 631	\$	- \$	- \$	45,000	\$-	\$	- Capital Stabilization Fund
Nhs Pre-School - Replace Office/Area Rugs	\$	- \$	- \$	40,000	\$-	\$	- Capital Stabilization Fund
Replace NFM-82 Work Van	\$	- \$	- \$	40,000	\$-	\$	- Capital Stabilization Fund
Replace CD-1	\$	- \$	- \$	35,000	\$-	\$	- Capital Stabilization Fund
DPW Admin Building - Replace 2 Rtu's	\$	- \$	- \$	30,000	\$-	\$	- Capital Stabilization Fund
Fire Station 1 - Replace Office Rug	\$	- \$	- \$	15,000	\$-	\$	- Capital Stabilization Fund
Replace Police K9	\$	- \$	- \$	6,000	\$-	\$	- Capital Stabilization Fund
Loker Playground Improvement	\$	- \$	- \$	-	\$ 200,000	\$	- Capital Stabilization Fund
Brown Playground Improvement	\$	- \$	- \$	-	\$ 200,000	\$	- Capital Stabilization Fund

Town of Natick								
Capital Stabilization Fund								
2019 2020 2021 2022 2023 Source								
Brown- Replace Unit Ventilators In Classrooms	\$	- \$	- \$		- \$	185,000 \$	- Capital Stabilization Fund	
Replace H-52 Utility Body Pickup	\$	- \$	- \$		- \$	175,000 \$	- Capital Stabilization Fund	
Brown - Replace Playground	\$	- \$	- \$		- \$	125,000 \$	- Capital Stabilization Fund	
Replace Recbus-2	\$	- \$	- \$		- \$	120,000 \$	- Capital Stabilization Fund	
Brown - Install A Cooking Kitchen	\$	- \$	- \$		- \$	100,000 \$	- Capital Stabilization Fund	
Replace W-20 Dump Truck	\$	- \$	- \$		- \$	95,000 \$	- Capital Stabilization Fund	
Replace NFM-83 Pickup Truck	\$	- \$	- \$		- \$	70,000 \$	- Capital Stabilization Fund	
Replace Car-4	\$	- \$	- \$		- \$	65,000 \$	- Capital Stabilization Fund	
Replace NFM-89 Box Truck	\$	- \$	- \$		- \$	60,000 \$	- Capital Stabilization Fund	
Replace H-1 Highway Supervisor Vehicle	\$	- \$	- \$		- \$	60,000 \$	- Capital Stabilization Fund	
Replace E-1 Utility Vehicle	\$	- \$	- \$		- \$	55,000 \$	- Capital Stabilization Fund	
Replace W-3 Utility Vehicle	\$	- \$	- \$		- \$	55,000 \$	- Capital Stabilization Fund	
Replace CD-2	\$	- \$	- \$		- \$	45,000 \$	- Capital Stabilization Fund	
High School - Purchase New Tractor	\$	- \$	- \$		- \$	30,000 \$	- Capital Stabilization Fund	
Lilja - Install Additional Parking Lot Lighting	\$	- \$	- \$		- \$	30,000 \$	- Capital Stabilization Fund	
Fire Station 1 - Replace VCT	\$	- \$	- \$		- \$	20,000 \$	- Capital Stabilization Fund	
Ben-Hem - Reconstruct Second Floor Storage Room	\$	- \$	- \$		- \$	10,000 \$	- Capital Stabilization Fund	
Replace S-39 Hooklift Truck	\$	- \$	- \$		- \$	- \$	140,000 Capital Stabilization Fund	
Replace LF-6 Hook-Lift Truck	\$	- \$	- \$		- \$	- \$	140,000 Capital Stabilization Fund	
Replace H-42 Dump Body Pickup	\$	- \$	- \$		- \$	- \$	100,000 Capital Stabilization Fund	
Replace LF-3 Dump Truck	\$	- \$	- \$		- \$	- \$	90,000 Capital Stabilization Fund	
Replace Car-5	\$	- \$	- \$		- \$	- \$	70,000 Capital Stabilization Fund	
Replace NFM-81 Service Van	\$	- \$	- \$		- \$	- \$	60,000 Capital Stabilization Fund	
Replace TH-1	\$	- \$	- \$		- \$	- \$	55,000 Capital Stabilization Fund	
Replace BH-2	\$	- \$	- \$		- \$	- \$	55,000 Capital Stabilization Fund	
Replace Rec-1	\$	- \$	- \$		- \$	- \$	55,000 Capital Stabilization Fund	
Replace NFM-87 Utility Vehicle	\$	- \$	- \$		- \$	- \$	50,000 Capital Stabilization Fund	
Replace Bullet Proof Vests	\$	- \$	- \$		- \$	- \$	45,000 Capital Stabilization Fund	
Police Building - Replace Garage Doors	\$	- \$	- \$		- \$	- \$	40,000 Capital Stabilization Fund	

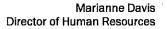
#### ITEM TITLE: Approve Request for Exemption from Town Bylaws Chapter 41, Section 4: Irene Carrick - Media Paraprofessional, Schools/ASAP Substitute Instructor, Schools

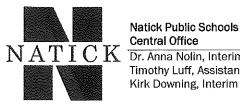
#### **ITEM SUMMARY:**

#### ATTACHMENTS: Description Irene Carrick

**Upload Date** 8/14/2018

**Type** Cover Memo





**Central Office** NATICK Dr. Anna Nolin, Interim Superintendent Timothy Luff, Assistant Superintendent for Student Services

Kirk Downing, Interim Assistant Superintendent for Curriculum and Assessment

August 6, 2018

TO: Board of Selectmen Town of Natick

RE: **Municipal Employees Exemptions** 

Dear Chairman,

I request the Board of Selectmen grant exceptions for the following employees from the provision of Article 41, Section 4, of the Town of Natick By-Laws in order that the School Department can hire these current town employees under the provisions of MGL Ch 268A S206.

Name Irene Carrick Current Position in School Media Paraprofessional

2<sup>nd</sup> Position in School **ASAP Substitute Instructor** 

Sincerely,

Maranie Dales

Marianne E. Davis **Director of Human Resources** 

Natick Public Schools does not discriminate on the basis of race, creed, color, sex, gender identity, religion, nationality, sexual orientation, disability, pregnancy and pregnancy-related conditions, physical and intellectual differences, immigration status, or homeless status.

508 • 647 • 6495 (phone) 508 • 655 • 7379 (fax) www.facebook.com/natickps

#### DISCLOSURE OF FINANCIAL INTEREST BY *MUNICIPAL EMPLOYEE*, CERTIFICATION BY HEAD OF CONTRACTING AGENCY AND APPROVAL AS REQUIRED BY G. L.C.268A §20(b)

Note: You are eligible for this exemption only if you meet all of the following requirements: Your regular agency is not the contracting agency or an agency that regulates the activities of the contracting agency; You do not participate in or have official responsibility for any of the activities of the contracting agency;

The contract was made after public notice or competitive bidding;

You complete, sign, and file with the town or city clerk this disclosure form;

And, If the contract is for your personal services:

The services will be provided outside your normal municipal working hours;

The services are not required as part of your regular duties as a municipal employee;

You are compensated for the services for not more than 500 hours during a calendar year;

The head of the contracting agency completes and signs the certificate below.

The city or town council, board of aldermen, or board of selectmen approve this exemption from '20 below.

Name:	I vene CARRICK
Tille or Position:	para at NHS Cobrary
Agency/Department:	NATICE public schools
Office Phone:	508647-6630
Contracting	
municipal agency:	NPS
Contract is for:	ASAR
	ASAT
Financial Interest of	
employee and	\$757
immediate family:	Ψ <i>1</i> 00
Employee	Λ
Signature:	Here Carrich
Date:	JULY 20,2018

CERTIFICATE BY HEAD OF CONTRACTING AGENCY (if contract is for municipal employee's personal services)

I certify that no employee of my agency is available to perform the contract services described above as part of his or her regular duties.

Name:	MARIANNE DAVIS	
Agency:	NATICK PUBLIC SCHOOLS	
Office Phone:	508-647-60495	
Signature:	Mayakal g. K) the	_
Date:	8/10/18	

APPROVAL OF EXEMPTION (If contract is for municipal employee's personal services)

The city or town council, board of aldermen, or board of selectmen approve this exemption from §20.

 Signature:		
- Date:		•
 After disclo	osure (and certification and approval, if needed) are completed and signed,	
	file this form with the city or town clerk. Attach additional pages if necessary.	

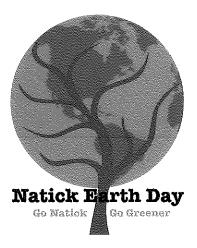
## ITEM TITLE: Approve Town Common Request: 2019 Natick Earth Day Festival - 4/28/19 (RD: 5/5/19)

#### **ITEM SUMMARY:**

#### ATTACHMENTS:

Description

Request Recreation & Parks Approval Upload Date 8/14/2018 8/17/2018 **Type** Cover Memo Cover Memo Natick Earth Day Planning Group: Carey Buttfield Pat Conaway Rhonda Garvin-Conaway Paul Joseph Tom Lally Ian Mevorach Doug Milch Mary Schelling-Burke Rich Whalen Jillian Wilson-Martin



Natick Earth Day Planning Group 11 Pumpkin Pine Road Natick, Massachusetts o1760 508-740-9949 bpconaway@gmail.com

Monday, July 30, 2018

Natick Recreation Commission Cole Center 179 Boden Lane Natick, Massachusetts 01760 Attention: Karen Partanen, Director

Dear Commissioners,

I am writing on behalf of the Natick Earth Day Planning Group to request permission to use the Natick Common for our 2019 Natick Earth Day Festival, Sunday, April 28, 2019, from 11 am – 3 pm, (Rain Date: Sunday, May 5). Let me know if this is possible. I will submit the permit request and deposit in a timely fashion. A new Planning TEAM will take over the Earth Day Festival Project. I will keep you informed of who they will be.

Sincerely lingsour at Conaway

(former Coordinator of the Earth Day Planning Group)

cc: Jon Freedman, Chair, Natick Board of Selectmen

The. Natick Community )rganic Farm 🔀

Farm - a nonprofit, certified organic farm providing open space, farm products and hands-on education for all ages year round. <u>www.NatickFarm.org</u>. You can also find us at <u>www.natick</u> earthday.org, or Natick Earth Day Festival – Facebook



Natick Recreation and Parks Department

"Create Community through People, Parks and Programs"

To the Board of Selectmen,

Please be informed that at their Monday, August 6, 2018 meeting the Natick Recreation and Parks Commission voted unanimously in favor of the following request for use of the Common. The Commission is recommending the following to the Board of Selectmen:

Natick Earth Day request to hold their 2019 Natick Earth Day Festival on the -Common on Sunday, April 28, 2019 (With a rain date of Sunday, May 5) from 11:00 am - 3:00 pm.

The Commission recommends a \$200 deposit and \$125 user fee for electricity.

Please feel free to contact me at the Recreation and Parks Department Office if you have any questions prior to your next meeting concerning this event.

Best Regards, Linda Pinault

179 Boden Lane • Natick, Massachusetts 01760 • Phone (508) 647-6530 • Fax (508) 647-6535 • Website http://natickma.gov/recreation

#### ITEM TITLE: Approve United Way of Tri-County 5K Run/Walk - 10/13/18 ITEM SUMMARY:

#### ATTACHMENTS:

**Description** Request & Police Approval Route Map **Upload Date** 8/14/2018 8/14/2018 **Type** Cover Memo Cover Memo



#### **Request for Street Use**

19 messages

Sandra Baldi <sandra.baldi@uwotc.org> To: "selectmen@natickma.org" <selectmen@natickma.org> Mon, Aug 6, 2018 at 3:11 PM

Honorable Natick Board of Selectmen,

Attached please find a letter of request from the United Way of Tri-County in Framingham to use streets in Natick for a portion of our 3<sup>rd</sup> annual 5K Run/Walk fundraiser on Saturday, October 13. We added a new sponsor this year, Jack's Abby, and have moved the start and finish of the race to the Jack's Abby location. The move to Jack's Abby made it necessary for us to change the route.

We respectfully request review of our request at your earliest convenience as we are just 10 weeks from the event (we received Jack's Abby approval only last week). We are happy to provide any information we can to help aid you in your decision.

Thank you so much for your time and consideration and we hope to hear back from you soon.

Warmest regards,

Sandy



SANDRA BALDI

United Way of Tri-County Special Events Manager sandra.baldi@uwotc.org | www.uwotc.org p:508.370.4873 | f:508.875.8862 46 Park Street | Framingham, MA 01702



Mathemath{blue}{blue}
 <sup>™</sup> United Way Request.pdf
 <sup>47K</sup>



**Sandra Baldi** <sandra.baldi@uwotc.org> To: Patricia O'Neil <poneil@natickma.org> Wed, Aug 8, 2018 at 9:59 AM

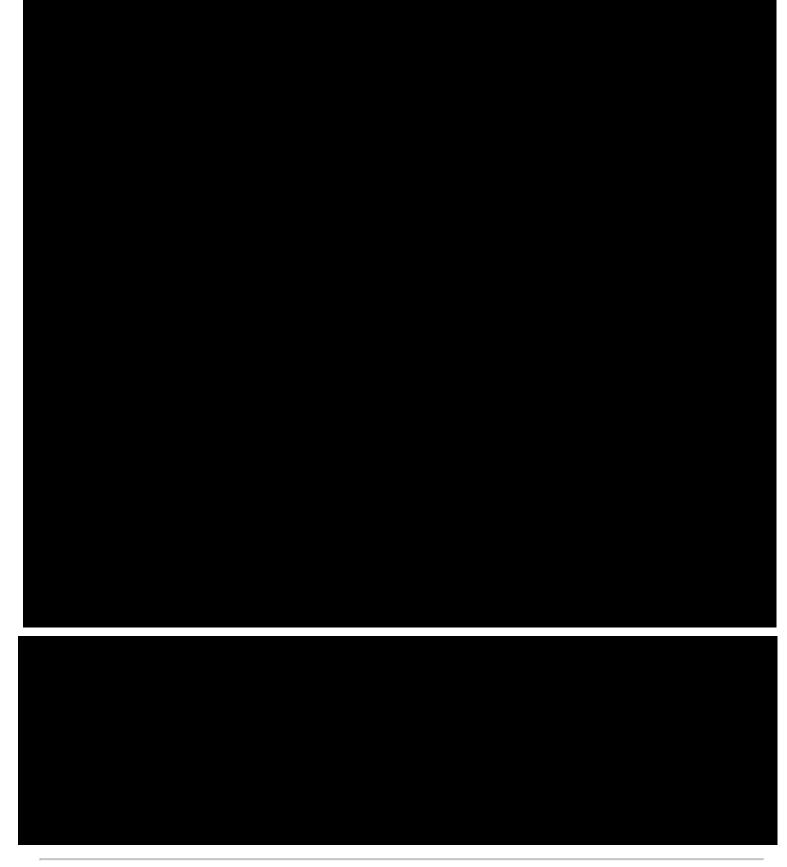
Hi Patricia,

There should have been a 2<sup>nd</sup> page with the map listing the streets, I'm sorry you didn't get that. Please see below the list of streets we would like to use. I also attached the map again, and wrote in the street names and the town boarder to help clarify the section of the route that goes into Natick.

- From Bishop Street turn right onto Loker
- From Loker turn left onto Hill
- On Hill turn right onto Madonna
- From Madonna turn left onto Howe
- From Howe turn right onto Longview
- From Longview turn right onto Morency

Thanks so much for all your help and please let me know if you need anything else.

Sandy



**Brian Lauzon** <lauzon@natickpolice.com> To: Patricia O'Neil <poneil@natickma.org> Wed, Aug 8, 2018 at 10:52 AM

Trish,

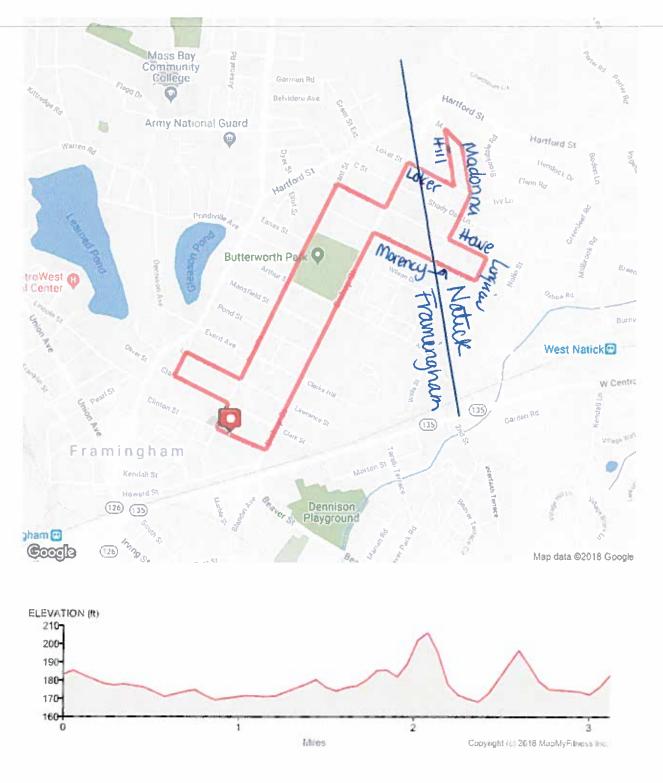
After review we would recommend that the BOS approve this request. From what has been presented, all of the streets proposed to be used for this event in Natick are residential with no major crossings posing any anticipated hazards for the participants.

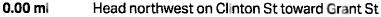
#### ⊁ 🖁 🗛 P M Y R U N

#### Jack's Abby UW 5K

Distance: 3.12 mi Elevation Gain: 54 ft Elevation Max: 207 ft

#### Notes





## **ITEM TITLE:** Approve Town Clerk's Request to Bag Meters for Free Voter Parking on Election Day, 9/4/18

#### **ITEM SUMMARY:**

#### ATTACHMENTS: Description Request

Police Approval

Upload Date 8/14/2018 8/16/2018 **Type** Cover Memo Cover Memo



Town of Natick Town Clerk's Office 13 East Central Street Natick, MA 01760 508-647-6430

#### **MEMORANDUM**

TO:	Board of Selectmen
CC	M Malone I Hicks B Lauzon

FROM: Diane Packer

DATE: August 14, 2018

RE: Parking on Election day: September 4<sup>th</sup>

The Morse Institute Library is the only polling location in Natick where there is metered parking. In the past the Board of Selectmen has allowed the Police Department to cover the meters on specific streets. I have spoken with Chief Hicks who said that it is possible to cover the meters with a bag which will have an insert which says "Voter Parking".

The meters and kiosks in the locations detailed below are the ones that we had previously requested:

- Pay at Kiosk spaces in the Town Hall Parking lot
- Metered spaces on East Central Street in front of and across from the Library
- Metered spaces on both sides of Washington Street from East Central St. to Court St.

This will not change any of the permit parking spaces. Poll workers will be provided with temporary permits which will only be valid for election day.

I request your positive action on this matter.

Thank you.

) (ane

#### Parking memo Sept 4 2018 election.pdf

24K

Brian Lauzon <lauzon@natickpolice.com> 10:35 AM To: Patricia O'Neil <poneil@natickma.org>

Trish,

After review we would recommend approval. This is something we have done for the last few elections and believe the efforts have been successful. We are prepared to coordinate this once approved by the board.

Respectfully,

Lt. Brian G. Lauzon

Thu, Aug 16, 2018 at

## **ITEM TITLE:** Confirm the Town Administrator's Reappointment of George Richards to the Golf Course Oversight Committee

#### **ITEM SUMMARY:**

#### ATTACHMENTS:

Description

Reappointment Letter-Term ending 6/30/2021

**Upload Date** 8/17/2018

**Type** Cover Memo



Town of Natick Massachusetts 01760

www/natickma.gov

Melissa A. Malone Town Administrator William D. Chenard Deputy Town Administrator/Operations John M. Townsend Deputy Town Administrator/Finance

August 16, 2018

George Richards 65 Everett Street Natick, MA 01760

RE: Golf Course Oversight Committee

Dear Mr. Richards:

In accordance with MGL, Chapter 164 of the Acts of 1998, I am informing the Board of Selectmen of my intent to reappoint you a member of the Golf Course Oversight Committee. Your appointment will be effective from July 1, 2018-June 30, 2021.

Please contact Town Clerk, Diane Packer at 508-647-6430 or <u>dpacker@natickma.org</u> at your earliest convenience to make arrangements to be sworn in for your new term. Please have this letter with you when you are sworn in by the Town Clerk.

Thank you for your continued time and commitment to the Golf Course Oversight Committee.

Sincerely,

Melina a. Mahup

Melissa A. Malone Town Administrator

Cc: Town Clerk

## ITEM TITLE: Reappoint Doug Landry to the Economic Development Committee ITEM SUMMARY:

#### ATTACHMENTS:

**Description** Application-Term ending 6/30/2021 **Upload Date** 8/17/2018

**Type** Cover Memo

#### Profile

Douglas	L	Landry		
First Name	Middle Initial	Last Name		
doug01760@gmail.com				
26 1/2 Grove Street				
Street Address			Suite or Apt	
Natick			МА	01760
City			State	Postal Code
What district do you live in	ו? *			
Precinct 4				<u> </u>
Home: (508) 545-1696	Mobile:			
Primary Phone	Alternate Phone			
Tighe & Bond	Vice			
Employer	Job Title			
Which Boards would you	like to apply for	?		
Economic Development Com	nittee: Submitted			
Are you a registered voter	in the Town of I	Natick?		
⊙ Yes O No				
Have you ever attended a	Natick town mee	eting?		
⊙ Yes ⊖ No			······	
Have you ever served on a	a board, commit	tee, or commiss	ion in the Town of	Natick?
⊙ Yes O No				

## If yes, please list name(s) of board, committee or commissions, along with date(s) of service:

Town Meeting Member Precinct 4 since 2010, Economic Development Committee since 2013 (seeking re-appointment)

#### Interests & Experiences

### Why are you interested in serving on a board or commission? Are there any changes you would like to see to these boards, committees and/or commissions?

I am seeking re-appointment to the EDC to continue our work to promote Natick as a desirable and advantageous place to locate and expand business, invest in the community, create jobs, and bolster our tax base.

#### Are you a graduate of the Natick Community Services Citizen's Leadership Academy?

O Yes O No

## Please list any skills or specialized knowledge you can bring to these boards, committees and/or commissions.

I have over 30 years of public and private sector experience in economic development projects across the state. I am versed in zoning, permitting, engineering/design, and economic development funding/financing, and have high level relationships with elected and appointed officials in federal, state, regional, and local government.

#### Please list any professional affiliations.

Member, Massachusetts Alliance for Economic Development (MassEcon); member, national Board of Directors, NAIOP Corporate; member, NAIOP Massachusetts; member, national Steering Committee, LOCUS Developers (a program of Smart Growth America); President, LOCUS Massachusetts; member, American Planning Association (APA) and member of American Institute of Certified Planners (AICP); member, Urban Land Institute;

#### Let us know what other specialized interests or hobbies you might have.

Upload a Resume

ITEM TITLE: Accept Resignation of Daiva Izbickas Verselis from the Zoning Board of Appeals

## **ITEM SUMMARY:**

ATTACHMENTS: Description Resignation Email

**Upload Date** 8/14/2018

**Type** Cover Memo



Donna Donovan <ddonovan@natickma.org>

#### Fwd: Resignation from ZBA

1 message

daiva@rcn.com <daiva@rcn.com> To: Donna Donovan <ddonovan@natickma.org>, jerrickson <jerrickson@natickma.org> Fri, Aug 3, 2018 at 10:46 AM

Donna I sent this earlier, I apologize I was given your email with an "a" instead of "o" I will miss the ZBA

Daiva

From: daiva@rcn.com

To: ddonavan@natickma.org, "Scott W Landgren" <landgrensw@cdmsmith.com> Sent: Monday, July 30, 2018 1:37:49 PM Subject: Resignation from ZBA

Dear Ms. Donaovan, With regret I am having to resign from ZBA as we will no longer be living in Natick as of August 7th.

We are in temporary housing for the time being. If we should be so lucky to find a home in Natick I will let you know and hope there is a spot to take at that time.

Regards, Daiva Izbickas Verselis

---

Daiva Izbickas REALTY EXECUTIVES BOSTON WEST 10 West Central Street Natick, MA 01760

508-523-9058 Cell 508-655-7396 Fax Daiva@rcn.com

www.DivaHomes.com

Daiva Izbickas REALTY EXECUTIVES BOSTON WEST 10 West Central Street Natick, MA 01760

508-523-9058 Cell

508-655-7396 Fax Daiva@rcn.com

www.DivaHomes.com

# ITEM TITLE: Weekly Warrant Review 8/2/18 ITEM SUMMARY:

# ATTACHMENTS:

**Description** 8/2/18

**Upload Date** 8/14/2018

**Type** Cover Memo



Town of Natick Massachusetts

Date: Aug 2, 2018

From: Cyndi Tomasetti Staff Accountant

To: Board of Selectmen

Subject: Warrant Review

In accordance with Board of Selectmen's procedures, the Chairperson was sent the following warrants for review and signature on August 2, 2018

Warrant Type	Warrant Number	Check date	Amount
Payroll	201906M	8/1/2018	\$3,890.57
Payroll	2019-07p	8/7/2018	1,494,618.73
Warrants payable	2019-07T	8/7/2018	366,944.07
Warrants payable	2019-07R	8/7/2018	2,933.61
Warrants payable	201907NC	8/7/2018	1,206,005.24

If you wish to review the details regarding any of these warrants please fee I free to contact this office.

Office of the Town Comptroller • 13 East Central Street • Natick, Massachusetts 01760 • (508) 647-6437 • Fax (508) 655-6980

## ITEM TITLE: Correspondence 8/20/18 ITEM SUMMARY:

### ATTACHMENTS:

Description Correspondence 8/20/18 **Upload Date** 8/17/2018

**Type** Cover Memo



Warren Griffin President Paul E Carew VSO Natick Veteran Services Department Natick Veterans Council September Newsletter 2018

## **Good Days All**

Here we are, fall fast approaching. It has been a hot summer, still is at this time of mailing. This office has been as always busy. I had attended an evening to meet the 8 remaining members of the 83<sup>rd</sup> Infantry Division at the Crowne Plaza. I got to give the Vietnam Moving Wall book and a certificate to all 7 of the veterans present. I did send a notice that this event was taking place. There were a couple of veterans who were able to show up, Thank you both. See flyer

On Sunday August 5<sup>th</sup> I met John Harlow on General Greene Ave at the Monument in his honor at 11 AM which was 4 years to the hour that MG Greene was Killed in Action. The first General Officer KIA since the Vietnam War. BG Greene was my first Base Commander when I and John Harlow started work here in Natick. God Bless you MG Greene. We sat for a while just talking about our memories of MG Greene, John refers to as the Boss.

Vangie Stick Square is now officially approved. Thank you to all involved in the process. It was approved by the Board of Selectman last Monday evening. Thank you again.

The 100<sup>th</sup> Anniversary Committee is still meeting on the third Thursday of the month here in the CSC at 6 PM. Thanks to those involved in the process. 11/11/11 in 1918. See flyer spread the word.

New officers in town, spread the word on events in this newsletter, if you have someone you think should be on this mailing let me or Warren know. Thanks.

I had good news at the Selectman's meeting Monday evening from the Town Administrator Melissa Malone. A state grant to Veteran Service for Veterans with Additions, in case many do not know I work with these veterans and have for many years. Thank you Melissa Malone and other State Elected Officials.

Dates to remember:

Vangie Sticka Dedication see flyer August 18th

Natick Days see flyer September 8<sup>th</sup> Meeting Veterans Council September 13<sup>th</sup> 7 PM CSC room 125

Dates in History September Citizenship Day September 17<sup>th</sup> Patriots Day September 11<sup>th</sup> Anniversary of 9/11 September 11<sup>th</sup> POW/MIA day September 21<sup>st</sup> US Air Force established September 18<sup>th</sup>

# Paul and Warren

If you would like to speak with one of the committee members here is our contact information. Contact me at <u>pcarew@natickma.org</u> or Warren at <u>griffcher@juno.com</u> or John Murphy at Have the information by the beginning of the third week of the month. VSO Office: 508-647-6545 or cell 508-745-8893

#### WE FOUGHT TOGETHER NOW LETS BUILD TOGETHER



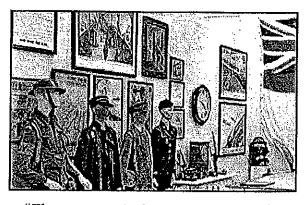
# Warren Griffin President Paul E Carew VSO Natick Veteran Services Department Natick Veterans Council

# 100<sup>th</sup> Anniversary of Veterans Day Displays of the times and guest speakers Buffett Brunch

November 11<sup>th</sup> 2018

# Event at Natick Elks 11/11/2018 at 12:30 PM

Donations accepted to fund this event Contact Veterans Services for details 508-647-6545



# 72nd Annual Reunion 83RD INFANTRY DIVISION ASSOCIATION

AUGUST 1-5, 2018

Verve Crowne Plaza, 1360 Worcester Street, Natick Massachusetts 01760, adjacent to the International Museum of World War II.

"The museum is the repository for the actual Holy Grail documents of World War II" – Tom Hanks

It is with great pleasure that we invite you to attend the 72nd annual reunion of the 83<sup>rd</sup> Infantry Division Association taking place August 1 through August 5,

2017 at the Verve Crowne Plaza, 1360 Worcester Street, Natick Massachusetts 01760, adjacent to the International Museum of World War II. The Museum has the most comprehensive WW II collection in the world. On display are 7500 documents, letters and artifacts. We have specially scheduled morning and afternoon visits on Thursday, August 2, 2018, a day that the Museum will not be open to the general public. Of course, the focal point of our reunion will be to meet up again with our stalwart veterans and enjoy the camaraderie of family and friends, new and old ..... another opportunity to honor our veterans of the Greatest Generation and commemorate their sacrifices and accomplishments.

Our current Agenda:

- On Wednesday, Registration opens at noon, followed by a late afternoon Welcoming event, including an introduction to the International Museum of WW II.
- On Thursday, morning and afternoon half-day visits to the International Museum of WW II, lunch at the hotel, morning and afternoon half-day guided bus tours of Lexington and Concord, followed in the evening by our First General Session including a *Conversation with Our Veterans*, a very special opportunity to question, listen and learn from the best!
- On Friday, we have a great day in Boston, starting with a specially arranged tour of the USS Constitution, followed by a visit to the USS Constitution Museum or WW II Destroyer USS Cassin Young; a guided City trolley tour and either a Boston Harbor cruise (with boxed lunch) or lunch on your own in the Quincy Market/Fanuell Hall area. Later that evening, we'll enjoy the *Research Roundtable* – another special opportunity to question, listen and learn from the experts.
- Saturday finds us at the Second General Session, including election of officers, followed by our Memorial Service, Catholic Mass and traditional Saturday evening banquet.

We are also planning a very special exhibition of 83<sup>rd</sup> war correspondence to be displayed throughout the reunion. During the reunion there will also be plenty of time to greet, meet and visit in the Hospitality Suite.

# HELP WANTED / NEEDED

# WHY? "NATICK DAYS"

# DATE AND TIME 9/8/2018 8 AM TO 3:30 PM

# Contact John Murphy 508-212-8523 Paul Carew 508-745-8893

Mr. Michael J. Hickey, Jr., Clerk Natick Town Offices Board of Selectmen 13 East Central Street Natick, MA 01760

#### Dear Mr. Hickey,

I would like to take this opportunity to thank you for questioning Natick's need for a parking garage particularly given the amount of money that is being talked about. I am sure that kind money can be put to better use. I think the estimated tax bills that we just received show that the town needs to rein in the spending of its citizen's tax dollars. Really, enough is enough.

I understand that tax rates fluctuate as our property values increase, but where is it said that we have to find ways to spend any new money collected. How about we give the money back to the taxpayers and reduce the tax burden. My estimated tax bill went up \$300/quarter. Big surprise!

I am retired and I have lived in Natick all of my life. As you would expect I have seen many changes over the years, some better than others, but it is time that we slow down the spending on new athletic fields, debt exclusion projects and brand new equipment. Why are we building new schools and then shortly thereafter adding modular classrooms, very poor planning? I just read something about the town's interest in possibly utilizing some of the Winona Farm property for more athletic fields. Really, we need to spend more money on athletic fields. Where are the additional tax dollars from Mathworks, Avalon, Cloverleaf & Modera, just to name a few, going? Where are the additional tax dollars from the new properties down town going, and the new hotel and 62 + project as well as the Exponent construction on route 9?

My neighbors as well as other residents that I have spoken with have many of the same questions and concerns. Even a resident that I was speaking with who moved into Natick 6 years ago is questioning her move from Newton given the tax bill that she just received. The seniors are being forced out of Natick. Natick can not be everything to everybody. I know that members of the Board meet at the Community Center to discuss various topics, but perhaps more of our leaders and officials should do the same thing and listen to what seniors and others are talking about regarding Natick's spending. I hope you will share my letter with others so that our leaders get a sense of the frustration many of us are feeling.

Thank you for your time and I hope you will continue to challenge and question how & where Natick's money is being spent.

Very truly yours,

any Lenglite

Larry Templeton 4 Gibbs Street Natick, MA 01760 (508) 653-1448

AUG - 3 2018

NATICK, MA

# xfinity

August 1, 2018

Board of Selectmen Town of Natick 13 East Central Street Natick, MA 01760

#### **Re: Important Information – beIN Sports Programming**

Dear Chairman and Members of the Board:

We are committed to keeping you and our customers abreast of the expiration of upcoming programming agreements. We regularly inform our customers in their bills and annual notices that we maintain a website (www.xfinitytv.com/contractrenewals) and toll-free number ((866) 216-8634) that are updated regularly to provide notice of the programming contracts that are set to expire in the coming months and the channels we might lose the rights to continue carrying.

As part of our ongoing commitment to keep you informed, we wanted to update you that Comcast's right to continue carrying beIN Sports' beIN and beIN en Español expired on July 31, 2018. As a result, we lost authorization to continue carrying these beIN networks as part of our lineup on August 1, 2018.

We want to carry these beIN Sports networks and provide our customers with the best value for beIN programming. To date, however, beIN Sports has been unwilling to provide an agreement that would enable us to carry its content in a way that reflects the value of these networks in a very competitive marketplace.

Since we lost authorization to carry this beIN Sports programming, we are preparing to activate www.ComcastFacts.com to help keep our customers informed during this period. We will continue to provide updates to you and our customers as we work to reach an agreement with beIN.

Should you have any questions, please do not hesitate to contact me at 508-647-1418.

Sincerely,

Greg Franks

Greg Franks, Sr. Manager Government Affairs