

TOWN OF NATICK, MASSACHUSETTS  
BOARD OF SELECTMEN

CONTRACT NO. W-148  
WEST CENTRAL, RT. 30  
WATER MAINS AND HEALTH CENTER  
FORCEMAIN

BOARD OF SELECTMEN

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SUSAN G. SALAMOFF, VICE CHAIRMAN  
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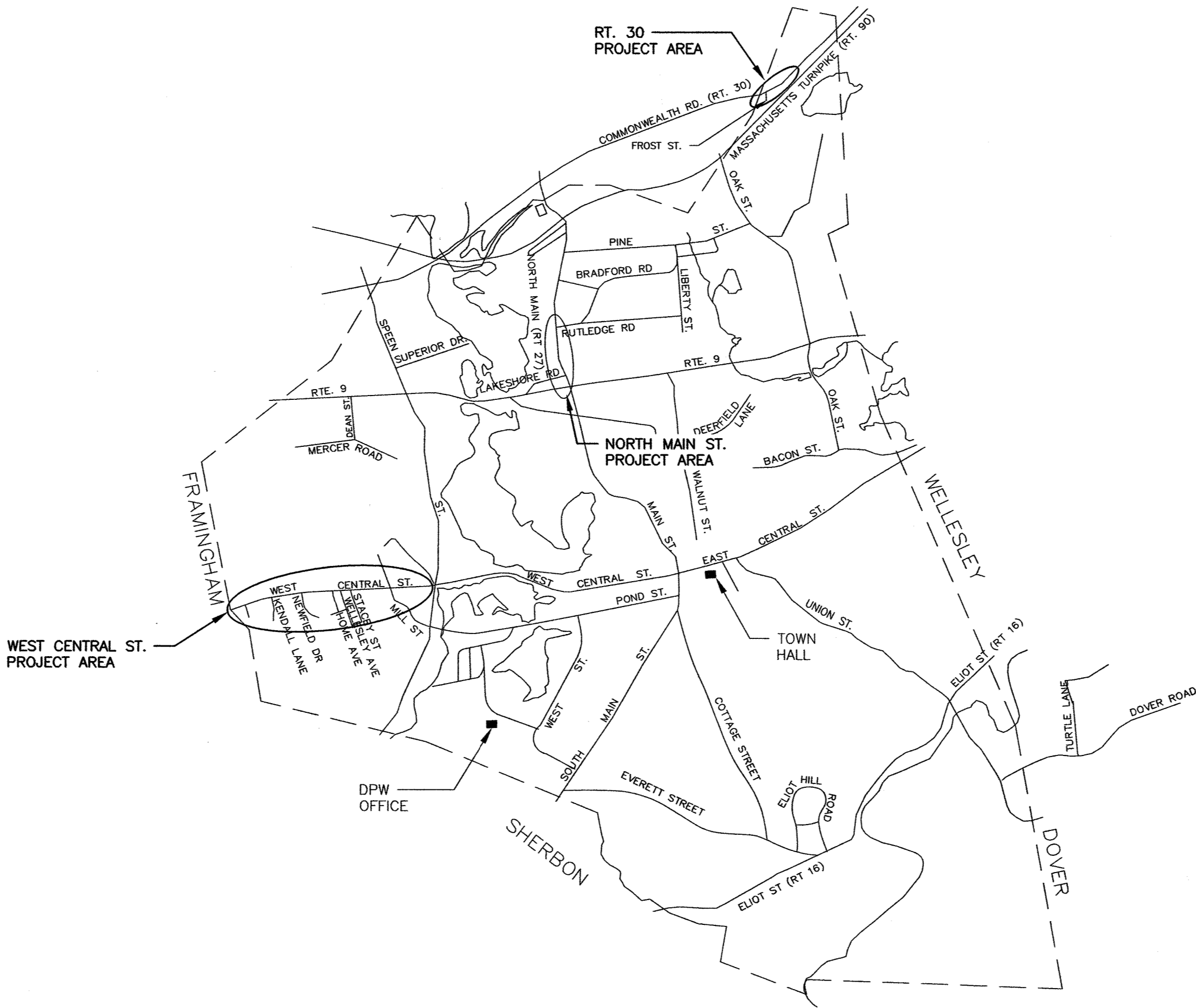
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WATER AND SEWER SUPERINTENDENT

ANTHONY COMEAU

HALEY AND WARD, INC.  
ENGINEERS  
MAYNARD, MASSACHUSETTS



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TOWN OF NATICK, MASSACHUSETTS  
BOARD OF SELECTMEN

WEST CENTRAL , RT. 30  
WATER MAINS AND HEALTH  
CENTER FORCEMAIN

VISIT OUR WEB SITE  
WWW.HALEYWARD.COM  
PLAN HOLDER LISTS  
BID RESULTS  
PROJECT DESCRIPTIONS  
CONTACT INFORMATION  
DIRECTIONS

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2 OF 21

CONTRACT NO.: W-148

SCALE: NONE

DATE DRAWN: JANUARY, 2018

DRAWN BY: LJC

FILE NO.: NAT-446\_001.DWG

DWG. NO.  
  
1

GENERAL NOTES:

1. THE WORK UNDER THE CONTRACT DOCUMENTS IS LOCATED WITHIN THE LAYOUTS OF THE PUBLIC WAYS IDENTIFIED ON THE DRAWINGS.
2. THE CONTRACTOR TO VIDEO TAPE ALL EXISTING CONDITIONS AT ALL PROJECT SITES PRIOR TO CONSTRUCTION INCLUDING EDGE OF ROAD, SIDEWALKS AND CURBS, LAWN AREAS, WALLS AND FENCES PER SECTION 01550.
3. ALL FITTINGS TO BE RESTRAINED JOINTS AND PROVIDED WITH THRUST BLOCKS.
4. CONTRACTOR SHALL MAKE ARRANGEMENTS WITH THE UTILITY COMPANY TO SUPPORT UTILITY POLES WHILE EXCAVATING ADJACENT TO POLES. ALL COSTS ASSOCIATED WITH POLE SUPPORT TO BE INCLUDED IN PIPE ITEM.
5. CONTRACTOR SHALL OBTAIN ROAD OPENING PERMIT, TRENCH SAFETY PERMIT AND NOTIFY DIG-SAFE AT 1-888-DIG-SAFE (1-888-344-7233) AT LEAST 72 HOURS PRIOR TO EXCAVATION.
- 5.1. CONTRACTOR IS TO BE RESPONSIBLE FOR CONFIRMING ALL UTILITY MARK-OUTS PRIOR TO START OF EXCAVATION INCLUDING NOTIFICATION OF DIG-SAFE AND NATICK ENGINEERING DEPARTMENT.
6. ALL UTILITIES AND SERVICES ARE SHOWN TO INDICATE THEIR PRESENCE ONLY, ACTUAL LOCATIONS WILL BE MARKED OUT IN FIELD THROUGH DIG-SAFE MARK OUT AND NATICK ENGINEERING MARK OUT.
- 6.1. WATER AND SEWER UTILITIES ARE THE PROPERTY OF THE TOWN OF NATICK. LOCATION OF WATER AND SEWER SERVICES AND MAINS IDENTIFIED ON PLANS ARE APPROXIMATE, ACTUAL LOCATIONS WILL BE MARKED OUT BY THE TOWN PRIOR TO START OF CONSTRUCTION. CONTRACTOR TO MAINTAIN MARKINGS THROUGHOUT CONSTRUCTION.
- 6.2. CONTRACTOR TO ASSUME EACH HOUSE HAS A WATER AND SEWER SERVICE WHERE THERE IS A WATER MAIN OR SEWER MAIN IN FRONT OF THE HOUSE.
- 6.3. ALL DAMAGE TO EXISTING WATER AND SEWER SERVICES CAUSED BY CONTRACTOR'S OPERATIONS WILL BE THE RESPONSIBILITY OF THE CONTRACTOR.
- 6.4. ANY CONTRACTOR DAMAGE TO EXISTING WATER AND SEWER SERVICES WILL REQUIRE REPLACEMENT WITH NEW MATERIALS TO A MINIMUM OF 2' OUTSIDE THE MAIN LINE TRENCH.
7. CONTRACTOR TO ASSUME EACH HOUSE HAS A GAS SERVICE WHERE THERE IS A GAS MAIN IN FRONT OF EACH HOUSE. DIG-SAFE MARK-OUT WILL CONFIRM LOCATION OF GAS SERVICES.
8. THE CONTRACTOR SHALL PROTECT EXISTING UNDERGROUND UTILITIES.
9. GAS MAINS ARE ASSUMED TO HAVE 2-3 FEET OF COVER, THE EXISTING WATER SEWER AND FORCEMAINS ARE ASSUMED TO HAVE 5 TO 6 FEET OF COVER, ELECTRIC DUCT BANKS ASSUMED TO HAVE 2-3 FEET OF COVER, UNLESS OTHERWISE NOTED, OR CROSSING UNDER UTILITIES.
10. THE CONTRACTOR SHALL NOTIFY THE ENGINEER OF ANY WATER AND SEWER SERVICES THAT ARE IN CONFLICT WITH THE WORK.
11. ALL TRENCHES AND TEST PITS MUST BE BACKFILLED OR COVERED WITH PINNED BEVELED STEEL PLATES DURING NON-WORKING HOURS.
12. THE CONTRACTOR MUST MAINTAIN THE FLOW OF TRAFFIC AT ALL TIMES AND IS RESPONSIBLE FOR SCHEDULING POLICE DETAILS. SEE TRAFFIC CONTROL NOTES.
13. OVERHEAD WIRES EXISTING WITHIN THE PROJECT SITE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING THE WIRES WHERE NECESSARY. ALL OVERHEAD WIRES ARE NOT SHOWN ON DRAWINGS TO MAINTAIN CLARITY.
14. CONTRACTOR TO MITIGATE PROPERTY OWNER'S ACCESS TO AND FROM THEIR DRIVEWAYS WHEN TRENCHING IN FRONT OF DRIVEWAY. IT IS IMPORTANT TO MINIMIZE IMPACT TO DRIVEWAYS BOTH DURING BUSINESS HOURS AND AFTER HOURS AND WEEKENDS.
15. CONTRACTOR TO UTILIZE A LICENSED HAZARDOUS WASTE CONTRACTOR TO CUT, REMOVE AND DISPOSE OF THE AC PIPE EXPECTED TO BE NEW FORCEMAIN TRANSMISSION SEWER MANHOLE. SEE CONTRACT SPECIFICATIONS FOR FURTHER REQUIREMENTS.
16. SEE DETAIL DRAWING FOR TRENCH RESTORATION WORK.
17. ALL EXISTING WATER MAIN PIPE IS CAST IRON UNLESS OTHERWISE NOTED.

18. CONTRACTOR SHALL FURNISH AND INSTALL STEEL PLATES SIZED TO PROTECT TRENCHES FROM HEAVY VEHICLE TRAFFIC WHEN WORK IS NOT OCCURRING IN TRENCH. CONTRACTOR SHALL PIN DOWN EDGES OF PLATES TO PREVENT VEHICLE DAMAGE OR INSTALL "COLD-PATCH" AROUND EDGES OF PLATES TO PREVENT VEHICLE DAMAGE. IF PLATES BOUNCE UNDER VEHICLE TRAFFIC THEN PLATES MUST BE PINNED.

19. WEST CENTRAL ROAD STRUCTURE INCLUDES APPROXIMATELY 5"-7" THICK BITUMINOUS PAVEMENT OVER A 8" PLUS REINFORCED CONCRETE SUB-BASE. ROUTE 30 ROAD STRUCTURE INCLUDES APPROXIMATELY 4" THICK BITUMINOUS PAVEMENT OVER A PROCESS GRAVEL ROAD SUB-BASE. FROST STREET ROAD STRUCTURE INCLUDES APPROXIMATELY 4" THICK BITUMINOUS PAVEMENT OVER A PROCESS GRAVEL ROAD SUB-BASE. NORTH MAIN STREET ROAD STRUCTURE INCLUDES APPROXIMATELY 6"-8" THICK BITUMINOUS PAVEMENT OVER A PROCESS GRAVEL ROAD SUB-BASE.

20. CONTRACTOR TO TAKE ALL PRECAUTIONS TO AVOID DAMAGE TO EXISTING LANDSCAPING DURING CONSTRUCTION, AS WHERE DAMAGED CONTRACTOR TO RETURN AREA TO ORIGINAL OR BETTER CONDITION.
21. SEE BORING LOGS IN APPENDIX OF CONTRACT FOR SOIL AND GROUNDWATER CONDITIONS.

22. ALL EXISTING STRUCTURES INCLUDING MAIL BOXES, PAPER BOXES AND FENCING, IF DAMAGED OR REMOVED DURING CONSTRUCTION, MUST BE RE-INSTALLED IF APPROVED BY OWNER/ENGINEER OR REPLACED WITH NEW MATERIALS.

23. CONTRACTOR SHALL NOTIFY ALL BUSINESS AND RESIDENTS OF PLANNED CONSTRUCTION DAILY TO ALLOW ALL VEHICLES TO BE LOCATED OFF THE CONSTRUCTION SITE, WHERE NECESSARY. ACCESS DRIVEWAY FOR SHOPPING CENTER ON NORTH MAIN STREET MUST NOT BE CLOSED DURING THEIR BUSINESS HOURS. ALL WORK REQUIRED TO BLOCK DRIVEWAY MUST BE COMPLETED AFTER 12:00 AM.

24. CONTRACTOR WILL NOT BE ALLOWED TO CUT AND REMOVE EXISTING UTILITIES TO ALLOW INSTALLATION OF NEW FORCEMAIN, UNLESS EXISTING UTILITY IS IN POOR CONDITION AS APPROVED BY OWNER. IT IS ANTICIPATED THAT SOME WATER SERVICES ARE ABOVE THE EXISTING FORCEMAIN. SEWER SERVICES ARE ASSUMED TO BE CLAY.

25. ANY CONTRACTOR DAMAGE TO NATICK EXISTING UTILITY SERVICES WILL REQUIRE REPLACEMENT WITH NEW MATERIALS TO A MINIMUM OF 2' OUTSIDE THE MAIN LINE TRENCH.

TRAFFIC MANAGEMENT NOTES:

1. THE CONTRACTOR MUST ALLOW THE FLOW OF TRAFFIC, 2-WAY TRAFFIC IS PREFERRED OR ALTERNATING DIRECTIONS AT ALL TIMES AND IS RESPONSIBLE FOR SCHEDULING POLICE DETAILS. SEE TRAFFIC MANAGEMENT DRAWINGS FOR ADDITIONAL REQUIREMENTS.
2. CONTRACTOR TO MITIGATE PROPERTY OWNER'S ACCESS TO AND FROM THEIR DRIVEWAYS WHEN TRENCHING IN FRONT OF DRIVEWAY. IT IS IMPORTANT TO MINIMIZE IMPACT TO DRIVEWAYS BOTH DURING BUSINESS HOURS AND AFTER HOURS AND WEEKENDS.
3. CONTINUOUS TWO LANE TRAFFIC IS PREFERRED ON WEST CENTRAL STREET FOR THE WATER MAIN WORK. WEST CENTRAL STREET WATER SERVICE INSTALLATION WILL REQUIRE ONE LANE ALTERNATING TRAFFIC AT ALL TIMES.
4. SEE THE TRAFFIC MANAGEMENT DRAWINGS AND DRAWING 9 AND 10 FOR ADDITIONAL TRAFFIC MANAGEMENT REQUIREMENTS AND NOTES FOR THE HEALTH CENTER PROJECT.
5. COMPLETE SHUT DOWN OF ANY ROADWAY WILL NOT BE ALLOWED, WITH THE EXCEPTION OF ROUTE 9 RAMPS WHERE SPECIFIED AND APPROVED BY THE OWNER AND MASSDOT. THIS WORK WOULD BE COMPLETED DURING NIGHTTIME WORK OR SATURDAYS.
6. CONTRACTOR TO FURNISH AND SETUP ELECTRONIC MESSAGE BOARDS AS REQUIRED BY CONTRACT DOCUMENTS, AT A MINIMUM OF TWO WEEKS PRIOR TO START OF WORK IN EACH PROJECT LOCATION.
7. CONTRACTOR TO INSTALL CONSTRUCTION SIGNAGE IN ACCORDANCE WITH CONTRACT DOCUMENTS AND MASSDOT TRAFFIC CONTROL, INCLUDING BUT NOT LIMITED TO CONSTRUCTION AHEAD SIGNS, POLICE DETAIL AHEAD, CONSTRUCTION BARRELS, CONES ETC.. ALL IN ACCORDANCE WITH THE SPECIFICATIONS AND DRAWINGS.
8. CONTRACTOR'S OPERATIONS SHALL BE SUCH THAT EMERGENCY VEHICLES CAN HAVE ACCESS TO ALL PROPERTIES AND BUILDINGS, COMMERCIAL AND RESIDENTIAL CONTRACTOR TO MITIGATE PROPERTY OWNER'S ACCESS TO AND FROM THEIR DRIVEWAYS WHEN TRENCHING IN FRONT OF DRIVEWAY.
9. IT IS IMPORTANT TO MINIMIZE IMPACT TO DRIVEWAYS BOTH DURING BUSINESS HOURS AND AFTER HOURS AND WEEKENDS.

ENVIRONMENTAL CONTROLS:

1. CONSERVATION COMMISSION'S AUTHORIZATION DOES NOT RELIEVE THE CONTRACTOR OR ANY OTHER PERSON OF THE NECESSITY OF COMPLYING WITH ALL OTHER APPLICABLE FEDERAL, STATE, OR LOCAL STATUTES, ORDINANCES, BYLAWS OR REGULATIONS.
2. CONTRACTOR SHALL TAKE APPROPRIATE MEASURES TO ENSURE THAT SEDIMENT-LADEN WATER, IF DEWATERING IS REQUIRED, IS APPROPRIATELY SETTLED PRIOR TO DISCHARGE TOWARDS RESOURCE AREAS IN ACCORDANCE WITH ALL APPLICABLE PERMITS, BY-LAWS, STANDARDS AND GUIDELINES.
3. PESTICIDES AND HERBICIDES SHALL NOT BE USED WITHIN THE BUFFER ZONE OF ANY WETLAND RESOURCE AREA OR WITHIN THE 200-FOOT RIVERFRONT PROTECTION AREA.
4. THE PROPOSED ACTIVITY SHALL COMPLY WITH THE PLANS AS PREPARED BY HALEY AND WARD, INC. ANY PROPOSED OR EXECUTED CHANGES MADE IN THE PLANS SHALL NOT BE MADE UNTIL THE CONTRACTOR HAS INQUIRED, IN WRITING, AND ENGINEER AND OR CONSERVATION COMMISSION HAS FORMALLY MADE A DETERMINATION AS TO THE NATURE OF THE CHANGE OR CHANGES.
5. PRIOR TO ANY WORK BEING DONE ON THE PROJECT SITE, THE CONTRACTOR SHALL INFORM THE OWNER AND ENGINEER, IN WRITING, OF THE NAMES, ADDRESSES, BUSINESS AND HOME PHONE NUMBERS OF BOTH THE PROJECT SUPERVISOR WHO WILL BE RESPONSIBLE FOR ENSURING ON-SITE COMPLIANCE WITH THE THE ENVIRONMENTAL CONTROLS, THE CONTRACTOR SHALL ALSO NOTIFY THE OWNER AND ENGINEER IN WRITING OF ANY CHANGES IN THIS INFORMATION.
6. ACCEPTED ENGINEERING AND CONSTRUCTION STANDARDS AND PROCEDURES SHALL BE FOLLOWED IN THE COMPLETION OF THIS PROJECT.
7. MEMBERS OF THE COMMISSION OR THEIR AGENTS SHALL HAVE THE RIGHT TO ENTER UPON AND INSPECT THE PREMISES TO EVALUATE THE ENVIRONMENTAL CONTROL.
8. A COPY OF THE CONSTRUCTION PLANS, SHALL BE ON SITE UPON COMMENCEMENT OF ANY SITE WORK AND MADE AVAILABLE TO ANY PERSON DOING WORK ON THE SITE.
9. THE CONTRACTOR SHALL ACT WITHIN 12 HOURS TO CONTROL ANY EROSION PROBLEMS THAT OCCUR ON THE SITE. ANY EROSION PREVENTION AND SEDIMENTATION PROTECTION MEASURES FOUND NECESSARY BY THE COMMISSION DURING CONSTRUCTION SHALL BE IMPLEMENTED AT THE DIRECTION OF THE COMMISSION OR ITS AGENT.
10. PRIOR TO THE COMMENCEMENT OF THE WORK ON THE PROJECT SITE, THE FILTER SOCK LINE SHALL BE INSTALLED AND INSPECTED BY THE CONSERVATION COMMISSION AS SHOWN ON THE PROJECT PLANS.
11. PRIOR TO ANY EXCAVATION ON THE PROJECT SITE, ANY CATCH BASIN POTENTIALLY RECEIVING RUNOFF FROM THE PROJECT SITE SHALL BE PROTECTED WITH A SILT BASKET TO ENSURE THAT RUNOFF FROM THE SITE DOES NOT CONVEY SEDIMENT INTO THE DRAINAGE SYSTEM. THE CONTRACTOR SHALL TAKE ADDITIONAL STEPS REQUIRED TO PREVENT THE MOVEMENT OF SEDIMENT FROM THE SITE.
12. THE EROSION CONTROLS SPECIFIED ON THE PROJECT PLANS SHALL NOT BE REMOVED UNTIL SUCH TIME AS THE ENTIRE SITE IS PERMANENTLY STABILIZED AND THE OWNER OR CONSERVATION COMMISSION HAS APPROVED THE REMOVAL. THIS SHALL MEAN THAT ALL DISTURBED AREAS HAVE BEEN COVERED BY BUILDING, PAVEMENT AND/OR COMPLETELY VEGETATED. IF THE APPLICANT INTENDS TO REMOVE THE EROSION CONTROLS PRIOR TO THE EVENTS AS STATED ABOVE, THE CONTRACTOR SHALL MAKE A WRITTEN REQUEST TO THE ENGINEER.
13. AS SOON AS POSSIBLE DURING CONSTRUCTION, ALL DISTURBED UPLAND AREAS WITHIN 100-FEET OF ANY RESOURCE AREA SHALL BE BROUGHT TO FINAL FINISHED GRADE AND STABILIZED PERMANENTLY AGAINST EROSION. THIS SHALL BE DONE EITHER BY SOD, OR BY LOAMING, SEEDING, AND MULCHING. STABILIZATION WILL BE CONSIDERED COMPLETE ONCE THE SURFACE SHOWS COMPLETE VEGETATIVE COVER. BARE GROUND THAT CANNOT BE PERMANENTLY STABILIZED WITHIN THIRTY (30) DAYS SHALL BE STABILIZED BY TEMPORARY MEASURES AS MAY BE REQUIRED BY THE NATICK CONSERVATION COMMISSION.
14. EXCEPT AS HEREIN NOTED, THERE SHALL BE NO STOCKPILING OF SOIL OR BRUSH OR ANY OTHER MATERIALS WITHIN THE BUFFER ZONE OF ANY RESOURCE AREA UNLESS IT IS ISOLATED WITHIN THE PAVED ROADWAY AND WILL BE IMMEDIATELY BACKFILLED ONCE THE PIPE IS INSTALLED.
15. DURING AND AFTER WORK ON THIS PROJECT, THERE SHALL BE NO DISCHARGE OR SPILLAGE OF FUEL, OIL, OR OTHER POLLUTANTS INTO ANY RESOURCE AREA OR BUFFER ZONE. THE APPLICANT SHALL TAKE ALL REASONABLE PRECAUTIONS TO PREVENT THE RELEASE OF POLLUTANTS BY IGNORANCE, ACCIDENT OR VANDALISM.
16. NO STORAGE OF PETROLEUM PRODUCTS (MOTOR OIL, GASOLINE, OR DIESEL FUEL) SHALL BE ALLOWED WITHIN 100-FEET OF ANY WETLAND RESOURCE AREA ON THE SITE AT ANY TIME. NO MOTORIZED VEHICLES SHALL BE STORED WITHIN 100-FEET OF ANY RESOURCE AREA. AT THE CONCLUSION OF THE WORK DAY, ALL MOTORIZED VEHICLES AND MOTORIZED EQUIPMENT SHALL BE REMOVED FROM ALL BUFFER ZONE AREAS.

WATER MAIN NOTES:

1. VALVE REPLACEMENT MAY BE REQUIRED TO ACHIEVE POSITIVE SHUTDOWN OF SIDE STREET CONNECTIONS. ALL COSTS ASSOCIATED WITH THESE MISCELLANEOUS PITS SHALL BE MEASURED AND PAID FOR UNDER THE MISCELLANEOUS PIT ITEM. VALVE, PIPE, FITTINGS, SOIL AND PAVEMENT TO BE PAID UNDER THE APPROPRIATE ITEMS.
2. ALL VALVES SHALL BE EPOXY COATED WITH STAINLESS STEEL HARDWARE.
3. WATER SERVICE GATE TIE CARDS WILL BE AVAILABLE TO THE CONTRACTOR UPON AWARD OF THE CONTRACT.
4. ALL FITTINGS AND VALVES ARE TO BE FULLY RESTRAINED, THRUST BLOCKED AND SUPPORTED. FITTING AND VALVE RESTRAINT SHALL BE "MEGA-LUG" "FOR D.I. PIPE OR "GRIP RING" FOR C.I. PIPE IN ALL INSTALLED LOCATIONS. WHERE NECESSARY CONTRACTOR SHALL USE FOSTER ADAPTERS TO ANCHOR ADDITIONAL VALVES TO TEES.
5. SOLID SLEEVES SHALL BE PROVIDED WHERE FEASIBLE (AT PROPOSED DUCTILE IRON PIPE AND WHERE CAST IRON PIPE O.D. PERMITS). THEY REQUIRE FULL RESTRAINT FOR WORK AT OVERSIZED CAST IRON PIPE WHERE SOLID SLEEVES ARE NOT AN OPTION, IN THE OPINION OF THE ENGINEER THAT GRINDING THICK SPOTS IS NOT FEASIBLE TO FIT SLEEVES ALTERNATIVE COUPLINGS MAY BE PROVIDED AS OUTLINED IN SECTION 02610, BUT ALSO REQUIRE FULL RESTRAINT.
6. REPLACEMENT HYDRANTS SHALL NOT BLOCK DRIVEWAYS AND SHALL HAVE NO BENDS.
7. WATER SERVICE NOTES:
- 7.1. TEMPORARY BYPASS PIPING SHALL BE PROVIDED ON EACH SIDE OF ALL STREETS.
- 7.2. TEMPORARY SERVICE SHALL BE PROVIDED THROUGH ONE OF THE FOLLOWING METHODS, AND AS DIRECTED BY THE OWNER:
- 7.2.1. CONNECTION MADE OUTSIDE THE BUILDING AT A SILL COCK (NOT AN OPTION IF BACKFLOW DEVICE IS PRESENT).
- 7.2.2. CONNECTION MADE INSIDE THE BUILDING AT A SERVICE METER.
- 7.2.3. CONNECTION MADE IN A PIT AT THE STREET AT THE CURB STOP (HOUSE SIDE). EXCAVATION AND RESTORATION OF THE PIT WILL BE PAID FOR BY UNIT ITEMS.
- 7.2.3.1. THIS METHOD SHALL BE REQUIRED, IF A CONNECTION IS MADE AT A SILL COCK OR SERVICE METER, IT IS DISCOVERED THE CURB STOP LEAKS (WHILE EFFECTIVELY BACKFED). ADDITIONALLY, THE CURB STOP/BOX SHALL BE REPLACED.
- 7.2.3.2. THE OWNER RESERVES THE RIGHT TO DIRECT THE CONTRACTOR TO MAKE THE CONNECTION IN A PIT AT THE STREET AND REPLACE THE CURB STOP/BOX ON A CASE BY CASE BASIS.
- 7.3. CONTRACTOR SHALL PROVIDE WATER SERVICE TUBING AND FITTINGS TO REESTABLISH SERVICE CONNECTIONS AFTER NEW WATER MAIN IS PLACED IN SERVICE.
- 7.4. SERVICE LINES SHALL BE FLUSHED PRIOR TO RETURNING TO PERMANENT SERVICE.

8. CONTRACTOR SHALL NOTIFY WATER DEPARTMENT SUPERINTENDENT 48 HOURS IN ADVANCE OF WHEN ANY SHUTDOWN IS REQUIRED. WATER DEPARTMENT PERSONNEL WILL OPERATE GATE VALVES TO ACHIEVE SHUTDOWN. CONTRACTOR TO SCHEDULE FOR AND ALLOW 48 HOURS BEFORE SHUT DOWN IS ACHIEVED.
9. TEST PITS FOR UTILITY INVESTIGATION SHALL BE AS DIRECTED BY OWNER OR ENGINEER.
10. FIRE LINES AND SIX INCH DIAMETER WATER SERVICES TO BUSINESSES SHALL BE INSTALLED FROM THE NEW WATER MAIN TO THE PROPERTY LINE, CAPPED, AND SUPPORTED FOR BACTERIA AND PRESSURE TESTING. ONCE TESTING IS COMPLETE AND ACCEPTED, CONTRACTOR TO REMOVE CAP AND CONNECT TO EXISTING SERVICE.

PIPE BURSTING NOTES:

1. CONTRACTOR SHALL EXCAVATED AT UTILITIES IN CLOSE PROXIMITY TO THE PIPE THAT WILL BE BURST, TO AVOID DAMAGE TO THOSE UTILITIES DURING THE PIPE BURSTING OPERATION. ALL COSTS ASSOCIATED WITH THESE PITS SHALL BE MEASURED AND PAID FOR UNDER THE INSPECTION PIT ITEM. VALVE, PIPE, FITTINGS, SOIL AND PAVEMENT TO BE PAID UNDER THE APPROPRIATE ITEMS.
2. ONCE A SECTION FOR PIPE BURSTING IS DE-WATERED, THE CONTRACTOR SHALL INSPECT THE INTERIOR WITH A REMOTE CONTROLLED CAMERA SYSTEM TO LOCATE POTENTIAL BLOCKAGES OR ITEMS THAT WOULD PREVENT A SUCCESSFUL PIPE BURSTING.
3. CONTRACTOR IS RESPONSIBLE FOR LAYING OUT THE LOCATIONS AND SPACING OF THE PIPE BURSTING PITS, WHICH ARE TO BE INCLUDED IN THE COST OF THE PIPE BURSTING, WITH THE EXCEPTION OF VALVES, PIPE, FITTINGS, SOIL AND PAVEMENT WHICH ARE TO BE PAID FOR UNDER THE APPROPRIATE ITEMS.

LEGEND:

|  |   |
|--|---|
|  | EDGE OF PAVEMENT  |
|  | RIGHT OF WAY AND APPROXIMATE LOCATION OF PROPERTY LINES |
|  | EXISTING 12" RCP  |
|  | EXISTING GAS LINE                                       |
|  | EXISTING 8" PVC SEWER                                   |
|  | EXISTING 8" C.I. WATER                                  |
|  | EXISTING SEWER SERVICE (depth at end labeled)           |
|  | EXISTING WATER SERVICE                                  |
|  | EXISTING CONTOUR ELEVATION                              |
|  | EXISTING POST/RAIL FENCE                                |
|  | NEW WATER   |
|  | BORDERING VEGETATED WETLAND (BVW)                       |
|  | SILT SOCK   |
|  | BVW 100' BUFFER ZONE                                    |
|  | MEAN ANNUAL HIGH WATER LINE                             |
|  | RIVER FRONT AREA BOUNDARY                               |

|  |                              |  |                       |
|--|------------------------------|--|-----------------------|
|  | EXISTING RIP-RAP             |  | EXISTING FIRE HYDRANT |
|  | DRAIN MANHOLE                |  | EXISTING WATER GATE   |
|  | UTILITY POLE                 |  | NEW FIRE HYDRANT      |
|  | UTILITY POLE W/GUY           |  | NEW WATER GATE        |
|  | GAS GATE                     |  | NEW SOLID SLEEVE      |
|  | EXISTING SEWER MANHOLE       |  | SIGN                  |
|  | CB WITH GRANITE THROAT STONE |  | BORING                |

ABBREVIATIONS

|                                  |
|----------------------------------|
| AC = ASBESTOS CEMENT             |
| BIT = BITUMINOUS                 |
| CI = CAST IRON                   |
| CL = CEMENT LINED                |
| CMP = CORRUGATED METAL PIPE      |
| DI = DUCTILE IRON                |
| DMH = DRAIN MANHOLES             |
| EOP = EDGE OF PAVEMENT           |
| EP = EDGE OF PAVEMENT            |
| GALV. = GALVANIZED IRON          |
| GRNT = GRANITE CURB              |
| GS = GAS SERVICE                 |
| HDPE = HIGH DENSITY POLYETHYLENE |
| ID = INSIDE DIAMETER             |
| IP = INTERMEDIATE PRESSURE       |
| MJ = MECHANICAL JOINT            |
| OD = OUTSIDE DIAMETER            |
| OHW = OVERHEAD WIRES             |
| PE = POLYETHYLENE                |
| PL = PLASTIC                     |
| PVC = POLYVINYL CHLORIDE         |
| RCP = REINFORCED CONCRETE PIPE   |
| RG = RETAINER GLAND              |
| SMH = SEWER MANHOLE              |
| ST = STEEL                       |
| SW = SIDEWALK                    |
| T = COMMUNICATIONS DUCT BANK     |
| VL = VITRIFIED CLAY              |
| WS = WATER SERVICE               |

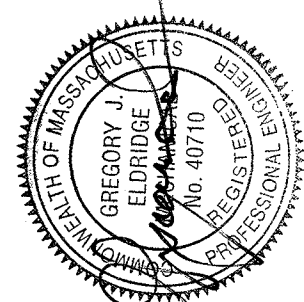
TOWN OF NATICK, MASSACHUSETTS  
BOARD OF SELECTMEN

WEST CENTRAL, RT. 30  
WATER MAINS & HEALTH  
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NOTES AND  
LEGEND

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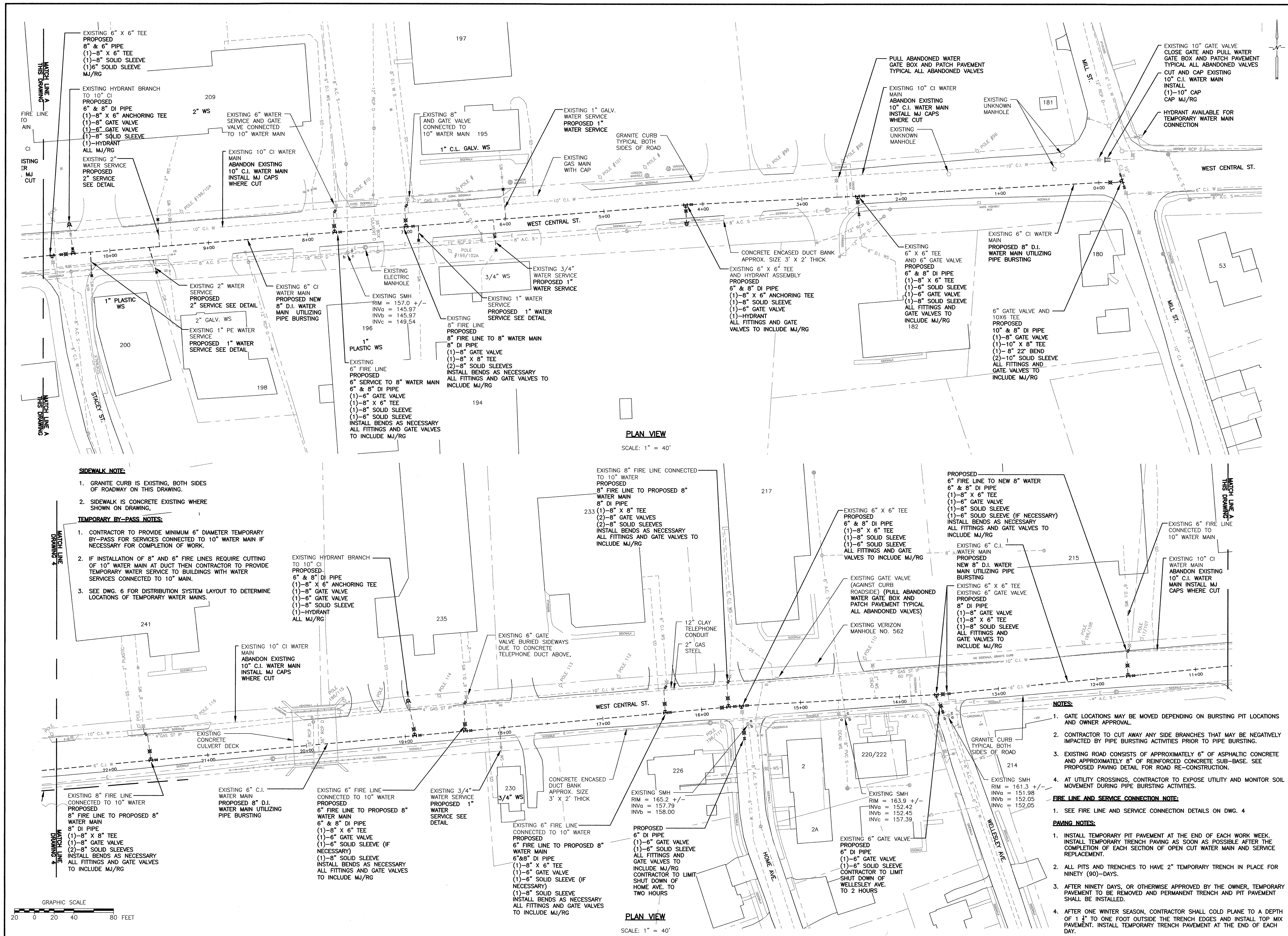


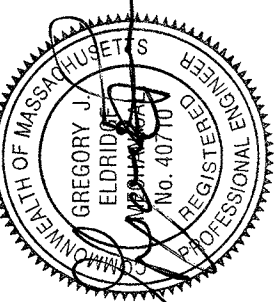
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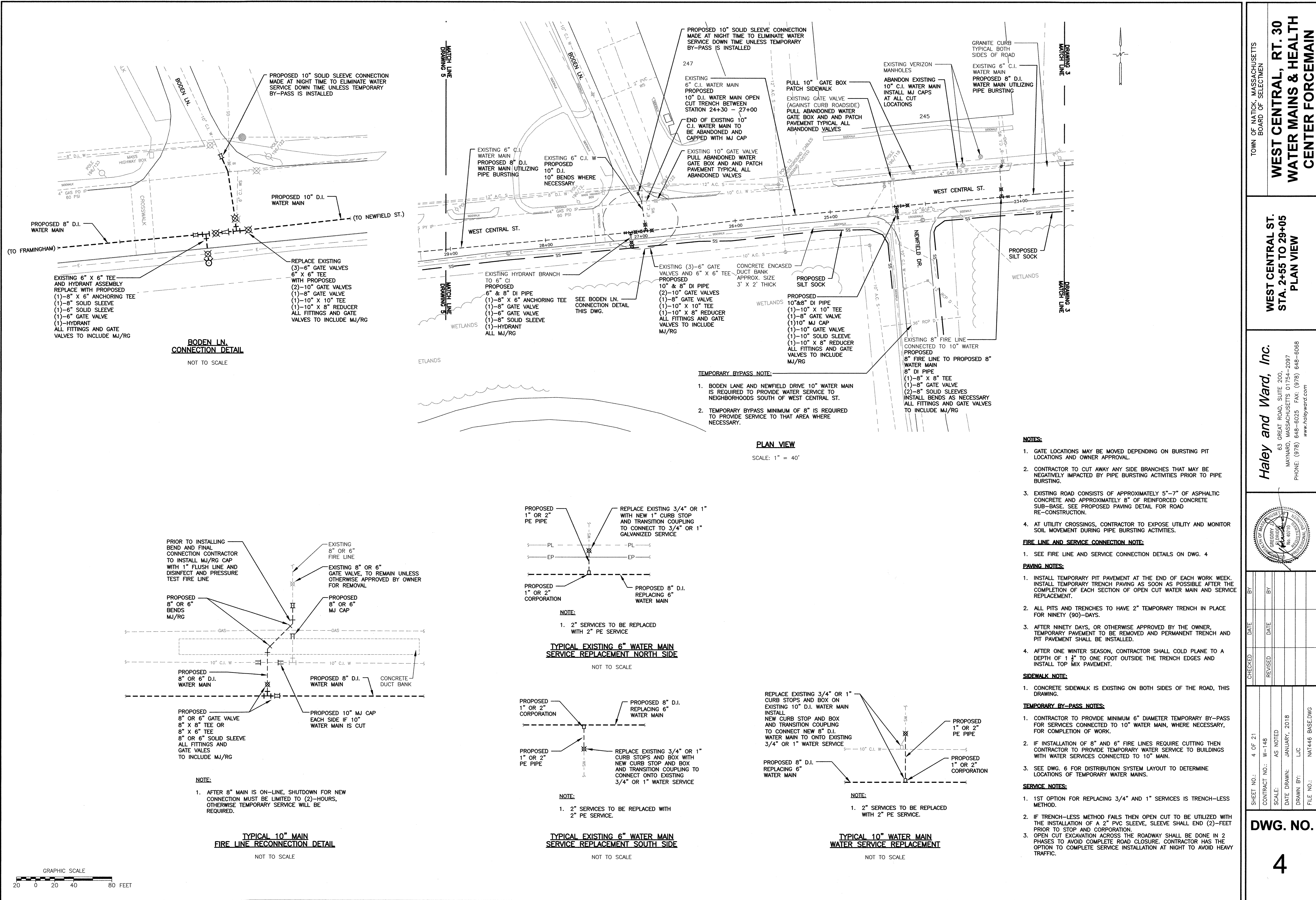
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| SHEET NO.:    | 2 OF 21         |
| CONTRACT NO.: | W-148           |
| SCALE:        | NONE            |
| DATE DRAWN:   | JANUARY, 2018   |
| DRAWN BY:     | LJC             |
| FILE NO.:     | NAT-448_002.DWG |

DWG. NO.

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| TOWN OF NATICK, MASSACHUSETTS<br>BOARD OF SELECTMEN   |      |
| <b>WEST CENTRAL, RT. 30<br/>WATER MAINS &amp; HEALTH<br/>CENTER FORCEMAIN</b>   |      |
| <b>WEST CENTRAL ST.<br/>STA. 0+00 TO 22+55<br/>PLAN VIEW</b>  |      |
| <b>Haley and Ward, Inc.</b><br>63 GREAT ROAD, SUITE 200,<br>MAYNARD, MASSACHUSETTS 01754-2097<br>PHONE: (978) 648-6025 FAX: (978) 648-6068<br>www.haleyward.com |      |
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| CHECKED   | DATE |
| BY  | DATE |
| REVIEWED  | DATE |
| BY  | DATE |
| SHEET NO.: 3 OF 21  |      |
| CONTRACT NO.: W-148   |      |
| SCALE: 1" = 40'   |      |
| DATE DRAWN: JANUARY, 2018   |      |
| DRAWN BY: LJC   |      |
| FILE NO.: NAT446 BASE.DWG   |      |
| <b>DWG. NO.</b>   |      |
| <b>3</b>  |      |



TOWN OF NATICK, MASSACHUSETTS  
BOARD OF SELECTMEN

WEST CENTRAL, RT. 30  
WATER MAINS & HEALTH  
CENTER FORCEMAIN

WEST CENTRAL ST.  
STA. 2+55 TO 29+05  
PLAN VIEW

Haley and Ward, Inc.

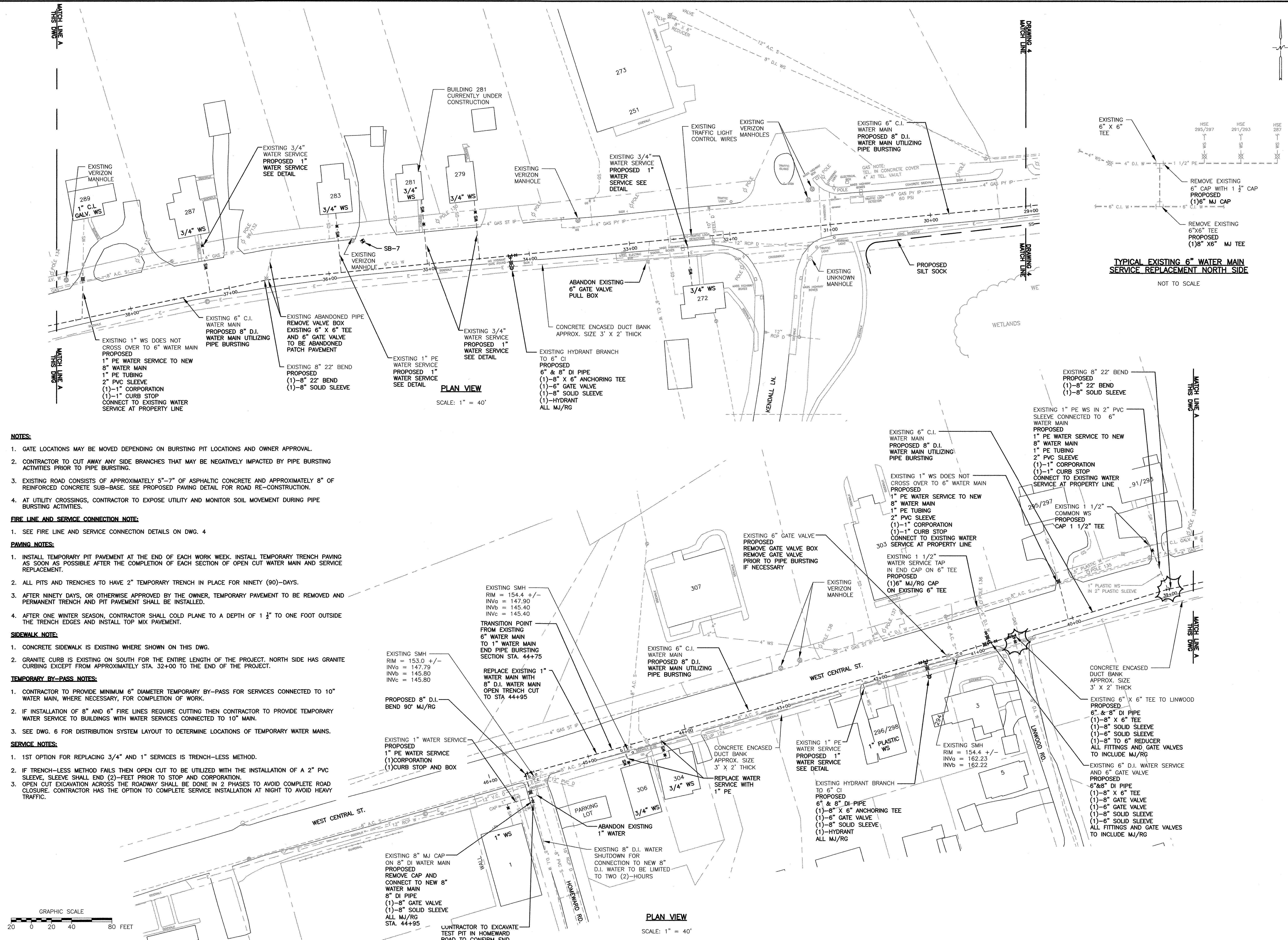
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| SHEET NO.:    | 4 OF 21         |
| CONTRACT NO.: | W-146           |
| SCALE:        | AS NOTED        |
| DATE DRAWN:   | JANUARY, 2018   |
| DRAWN BY:     | LJC             |
| FILE NO.:     | NAT446 BASE.DWG |

DWG. NO.

4



TOWN OF NATICK, MASSACHUSETTS  
BOARD OF SELECTMEN

WEST CENTRAL, RT. 30  
WATER MAINS & HEALTH  
CENTER FORCEMAIN

WEST CENTRAL ST.  
STA. 29+05 TO 46+00  
PLAN VIEW

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5 OF 21

CONTRACT NO.: W-148

SCALE: 1" = 40'

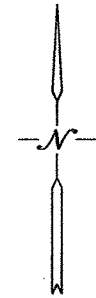
DATE DRAWN: JANUARY, 2018

DRAWN BY: LJC

FILE NO.: NAT446 BASE.DWG

DWG. NO.

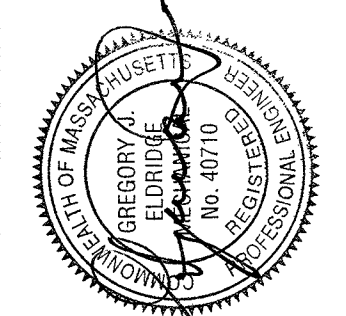
5



TOWN OF NATICK, MASSACHUSETTS  
BOARD OF SELECTMEN  
**WEST CENTRAL, RT. 30  
WATER MAIN & HEALTH  
FORCEMAIN**

**WATER SYSTEM  
OVERVIEW MAP  
FOR TEMPORARY PIPING  
6\"**

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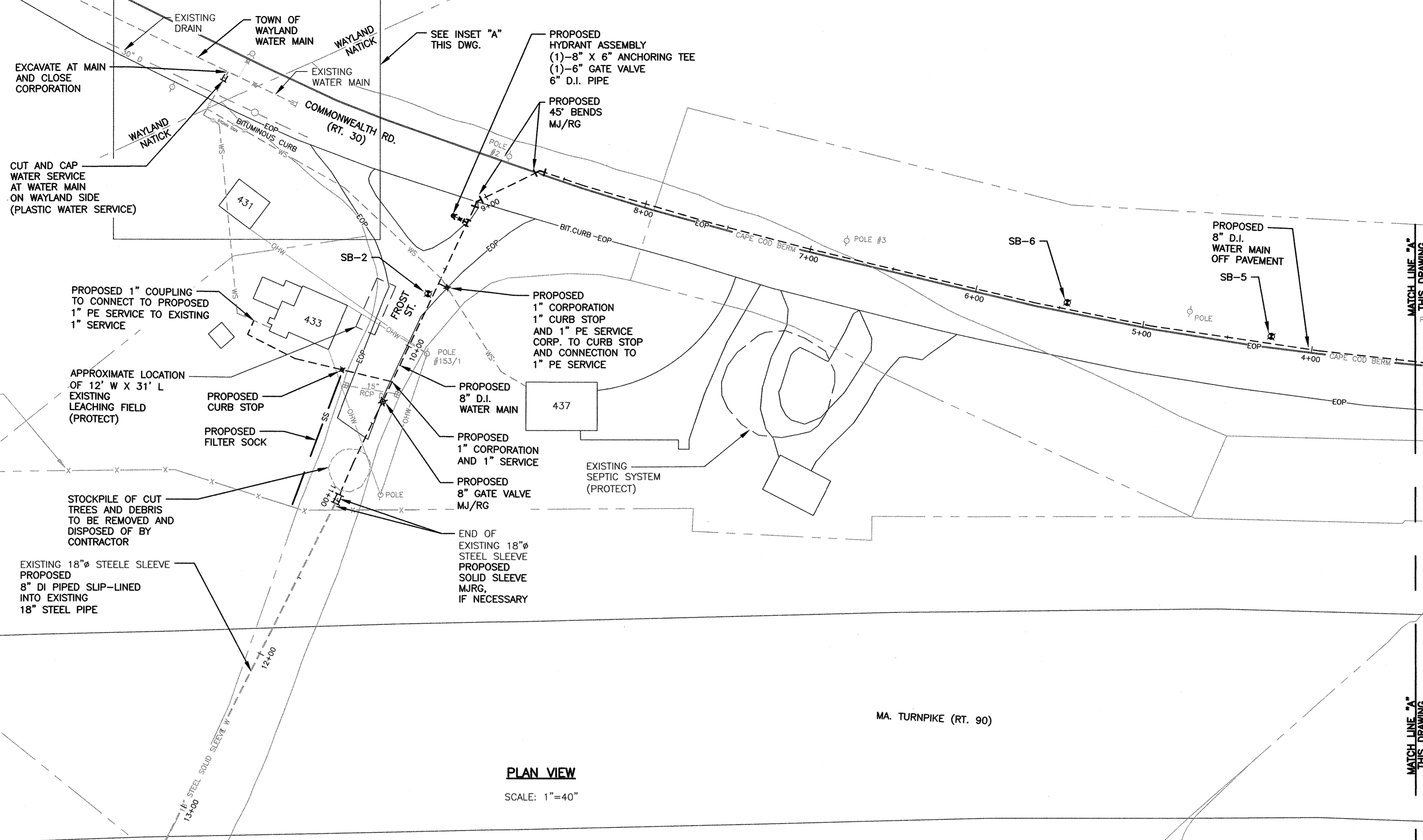


| SHEET NO.:  | 6 OF 21             | CHECKED | DATE | BY |
|-------------|---------------------|---------|------|----|
|             | CONTRACT NO.: W-148 |         |      |    |
| SCALE:      | 1:200               | REVISED | DATE | BY |
| DATE DRAWN: | MARCH, 2017         |         |      |    |
| DRAWN BY:   | LJC                 |         |      |    |
| FILE NO.:   | NAT-446_006.DWG     |         |      |    |

**DWG. NO.**  
**6**

# RT. 30 PAVING NOTE THIS DWG.

1. TEMPORARY PATCH PAVEMENT EACH FRIDAY.
2. CONTRACTOR TO INSTALL TEMPORARY FOG LINE.
3. FOLLOWING A (90)-DAY SETTLING PERIOD CONTRACTOR TO REMOVE TEMPORARY PATCH, INSTALL NEW BITUMINOUS CAPE COD BERM AND PERMANENT PATCH (3 1/2" BINDER, 1 1/2" TOP COAT).
4. AFTER PAVEMENT TRENCH PATCH CONTRACTOR TO INSTALL FOG LINE.

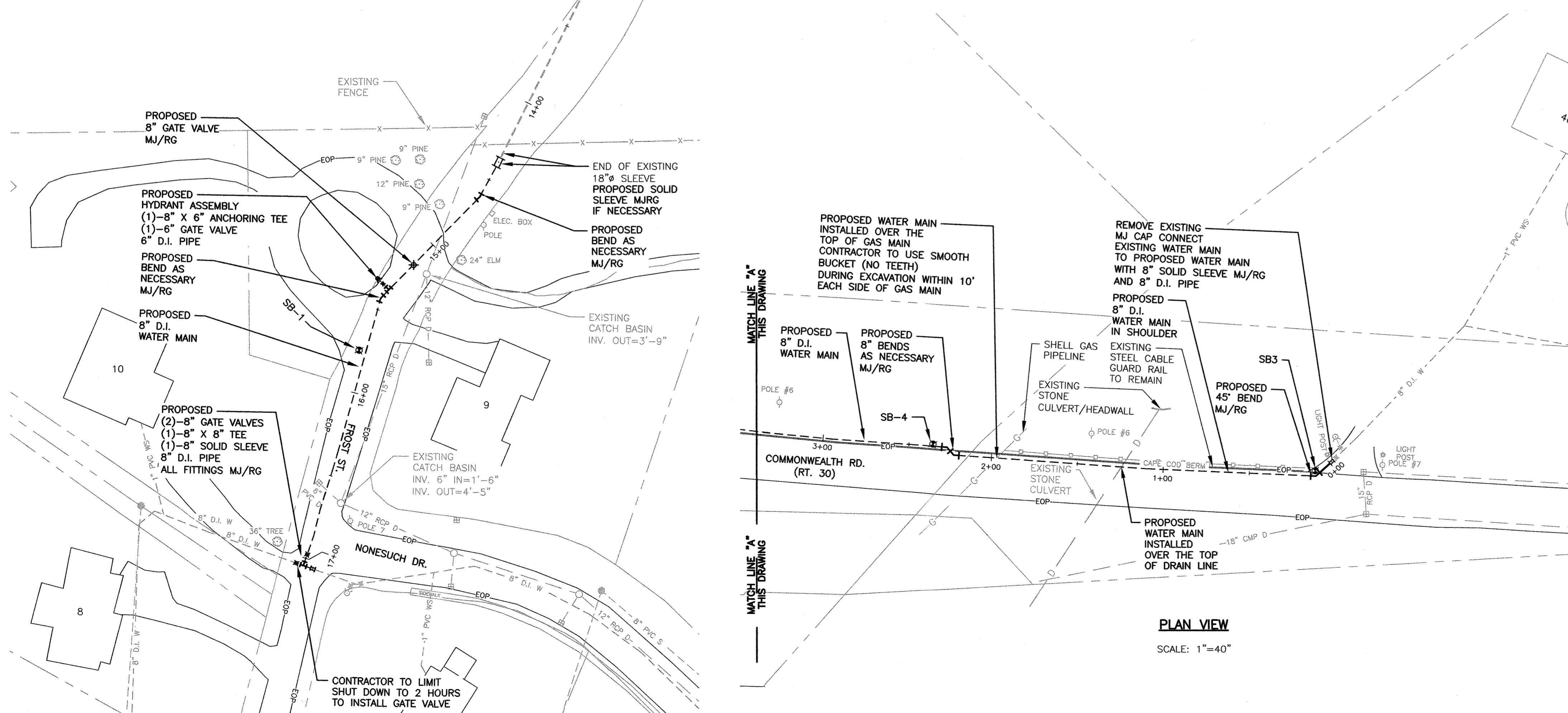


## PLAN VIEW

SCALE: 1"=40"

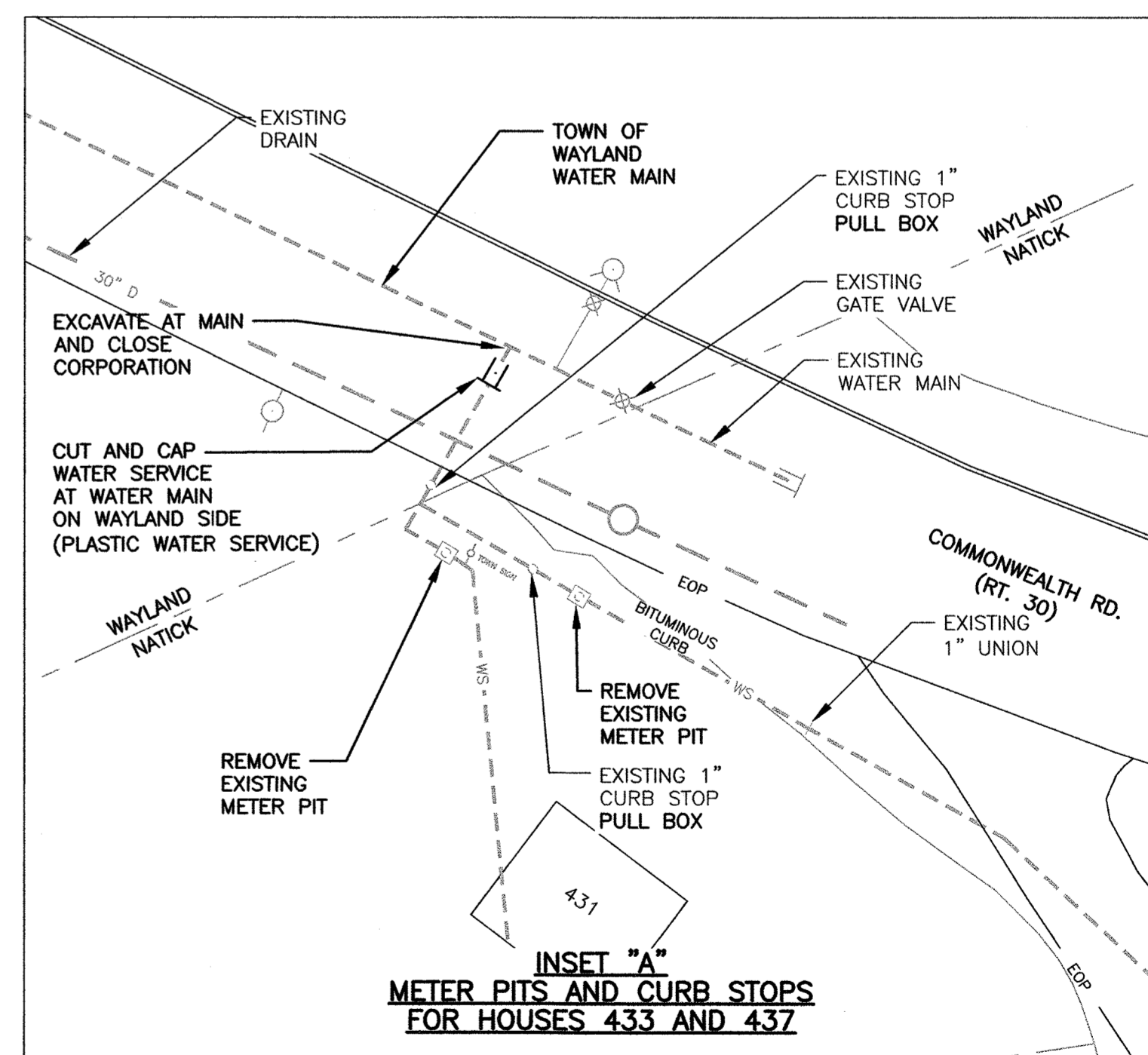
## TRAFFIC CONTROL NOTES:

1. ELECTRONIC MESSAGE BOARD REQUIRED.
2. ONE LANE ALTERNATING TRAFFIC, MUST BE MAINTAINED AT ALL TIMES.
3. WATER MAIN CROSSING ROUTE 30 TO BE CONSTRUCTED IN TWO PHASES TO AVOID ROAD CLOSURE.



## PLAN VIEW

SCALE: 1"=40"

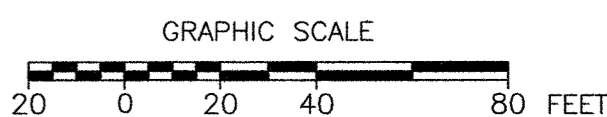


## INSET "A" METER PITS AND CURB STOPS FOR HOUSES 433 AND 437

SCALE: 1"=20"

## FROST ST. PAVING NOTES THIS DWG.

1. INSTALL 2" TEMPORARY TRENCH PATCH.
2. AFTER NINETY (90)-DAYS SETTLING PERIOD REMOVE TEMPORARY PATCH
3. BETWEEN STA. 15+25 TO STA. 15+80 CUT PAVEMENT BACK TO 1' EACH SIDE OF TRENCH AND INSTALL PERMANENT TRENCH PAVEMENT (3" BINDER, 1 1/2" TOP COAT).
4. BETWEEN STA. 14+80 TO STA. 17+15 REMOVE ALL PAVEMENT ON WEST SIDE OF TRENCH AND CUT BACK PAVEMENT 1' ON EAST SIDE OF TRENCH INSTALL PERMANENT TRENCH PATCH (3" BINDER, 1 1/2" TOP COAT).



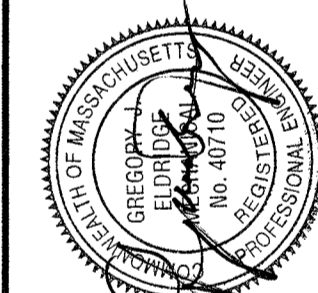
TOWN OF NATICK, MASSACHUSETTS  
BOARD OF SELECTMEN

**WEST CENTRAL ST.  
AND RT. 30  
WATER MAINS**

**RT. 30 AND FROST ST.  
STA. 0+00 TO 17+15  
PLAN VIEW**

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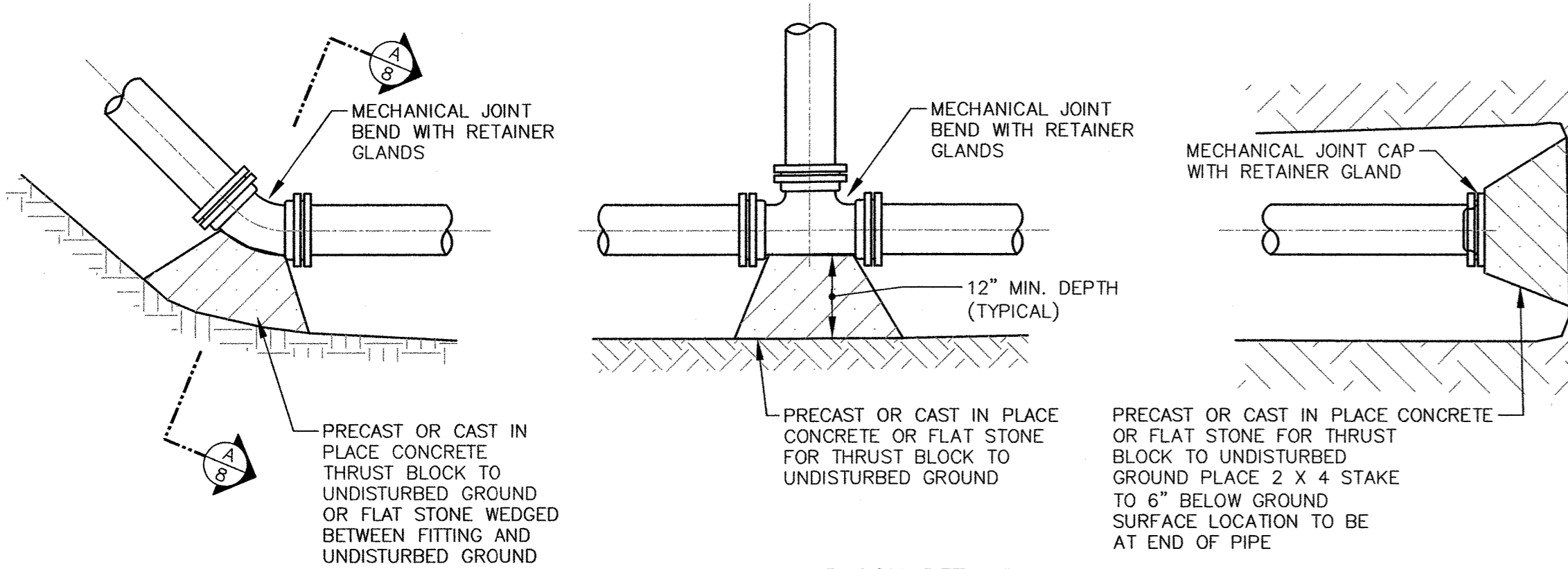


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| SHEET NO.:    | 7 OF 21         |
| CONTRACT NO.: | W-148           |
| SCALE:        | AS NOTED        |
| DATE DRAWN:   | JANUARY, 2018   |
| DRAWN BY:     | LUC             |
| FILE NO.:     | NAT445 BASE.DWG |

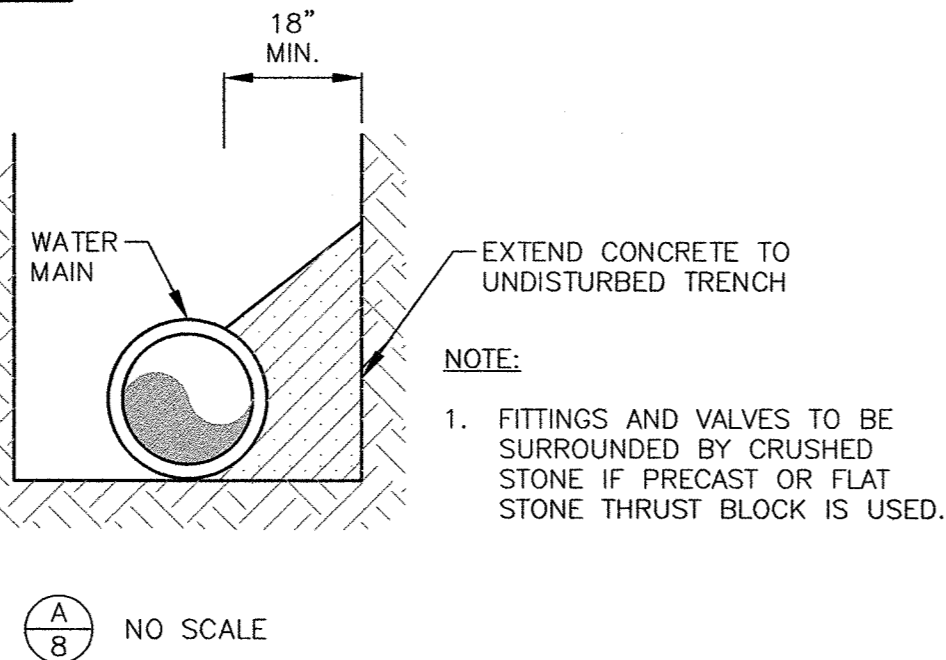
**DWG. NO.**

**7**



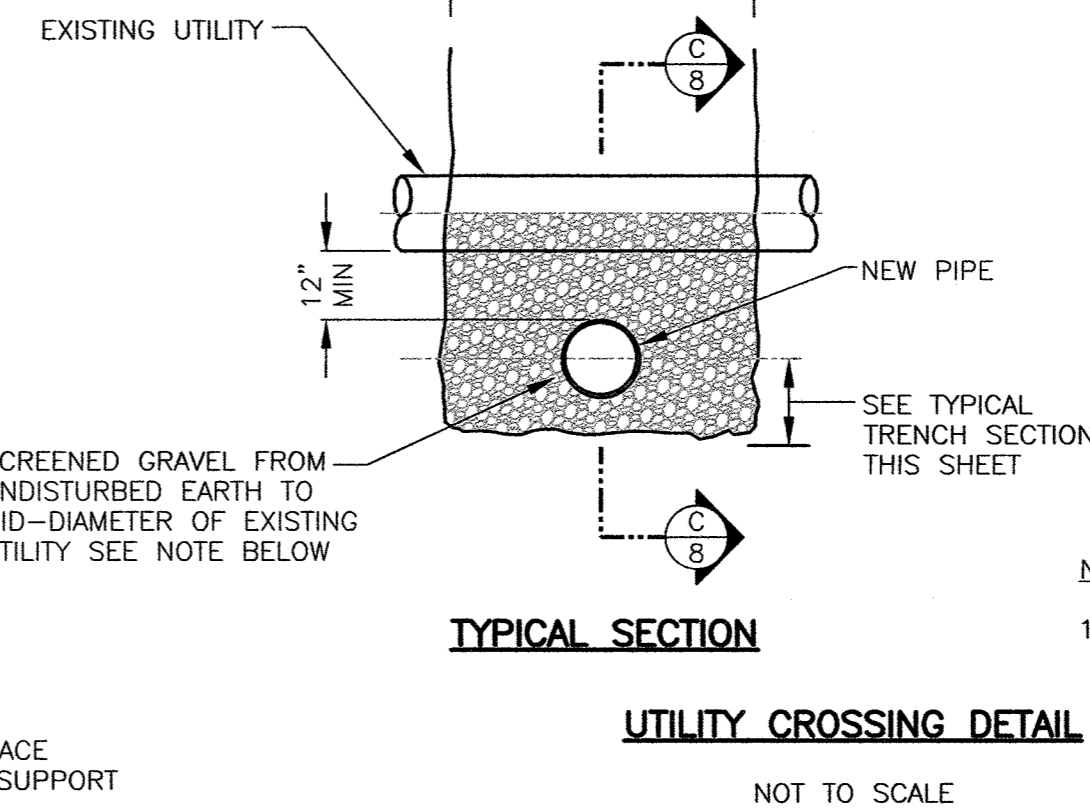
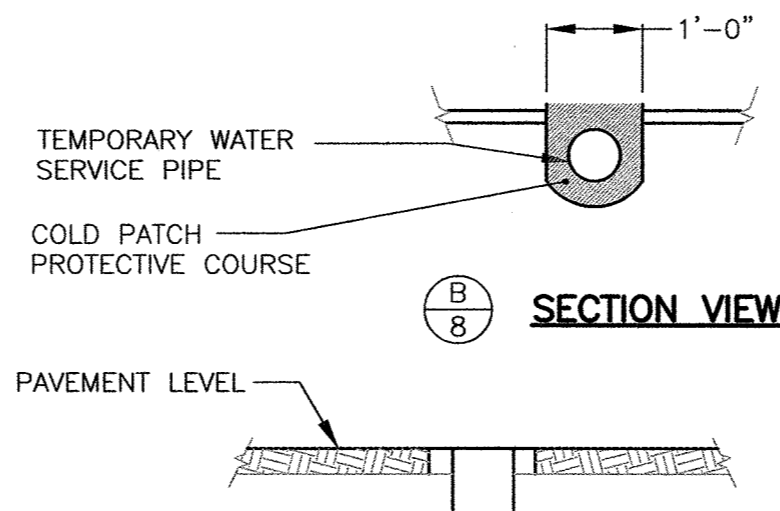
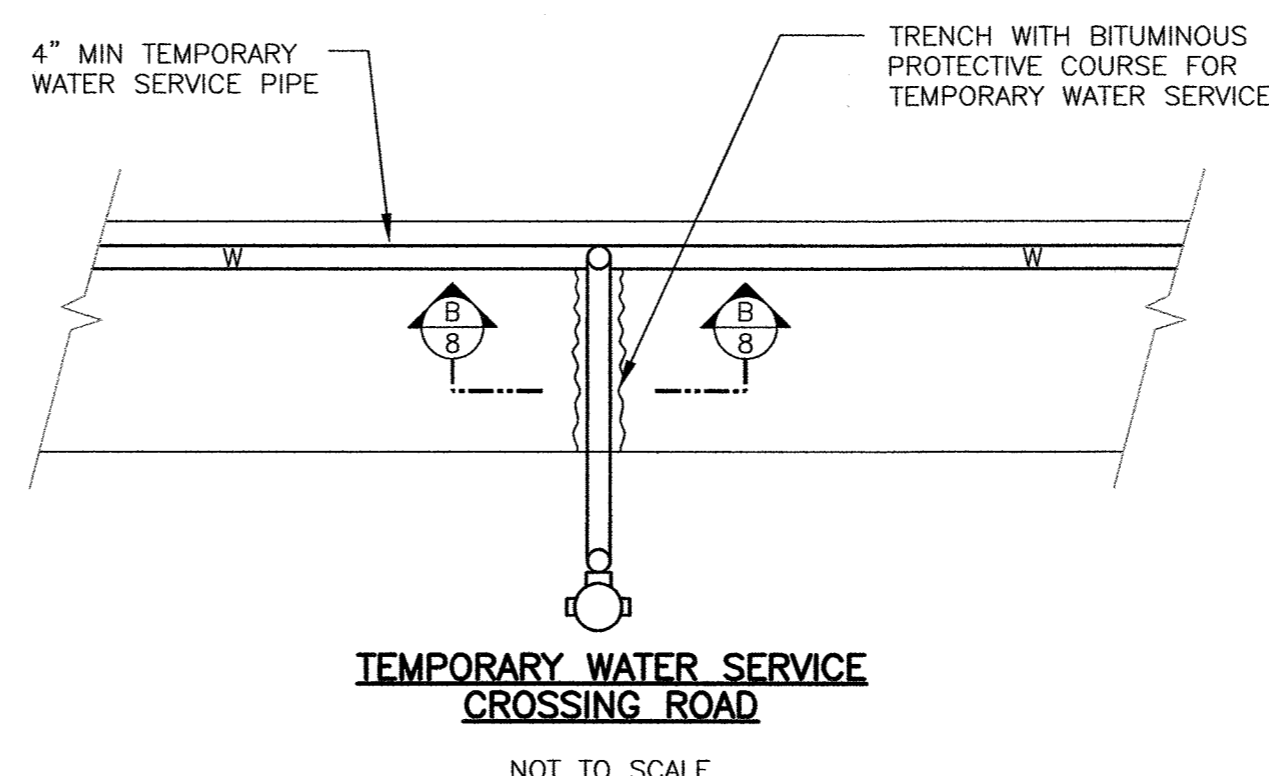
| PIPE DIAMETER | BENDS |      |     |     | TEE |
|---------------|-------|------|-----|-----|-----|
|               | 11.25 | 22.5 | 45  | 90  |     |
| 6             | 1     | 1    | 1   | 2   | 1.5 |
| 8             | 1     | 1    | 2   | 3   | 2.5 |
| 12            | 1     | 2    | 3.5 | 6.5 | 5   |

THRUST BLOCK BEARING AREA (SF)  
(BASED UPON 100 PSI WATER PRESSURE  
AND 3000 PSF BEARING LOAD CAPACITY)

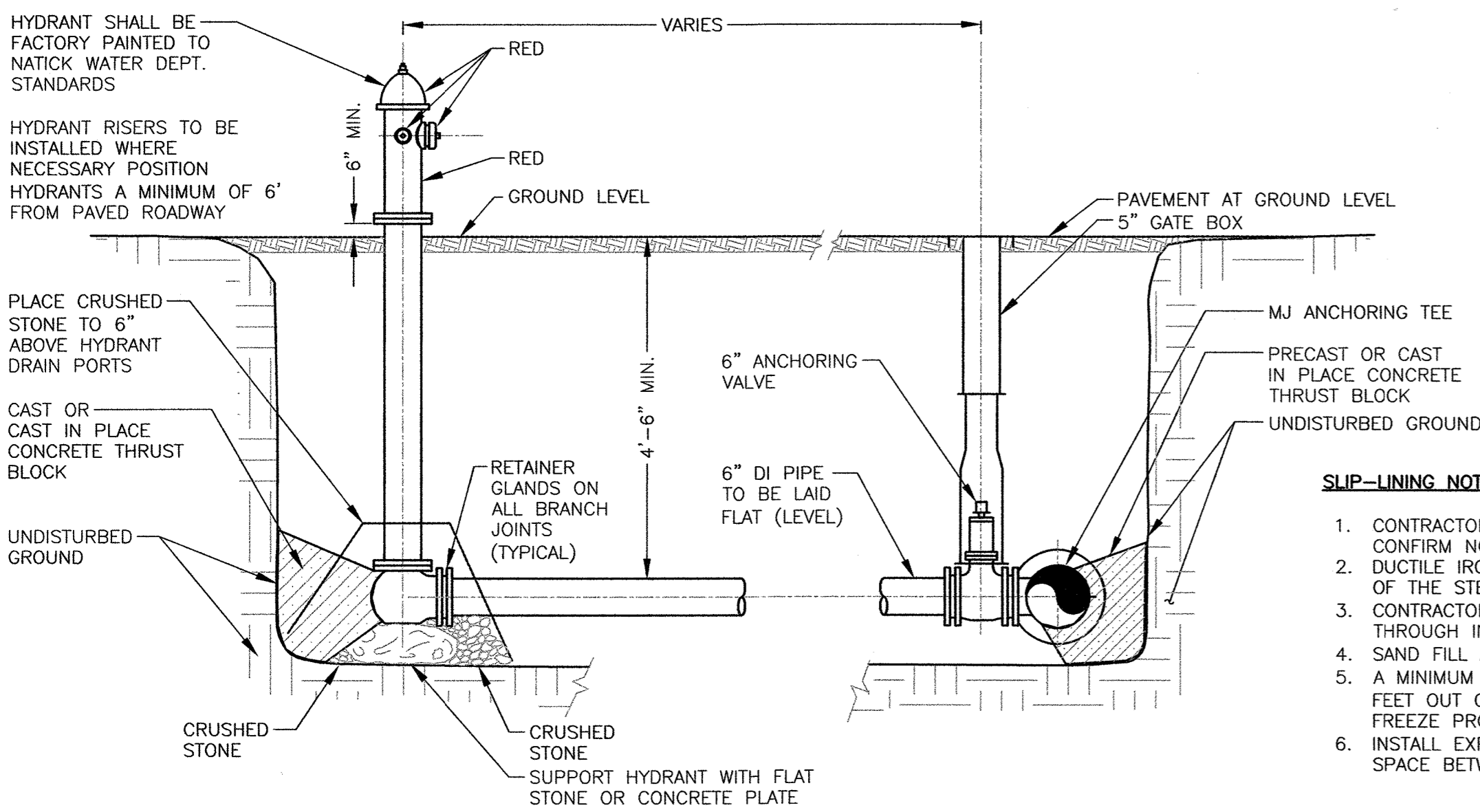
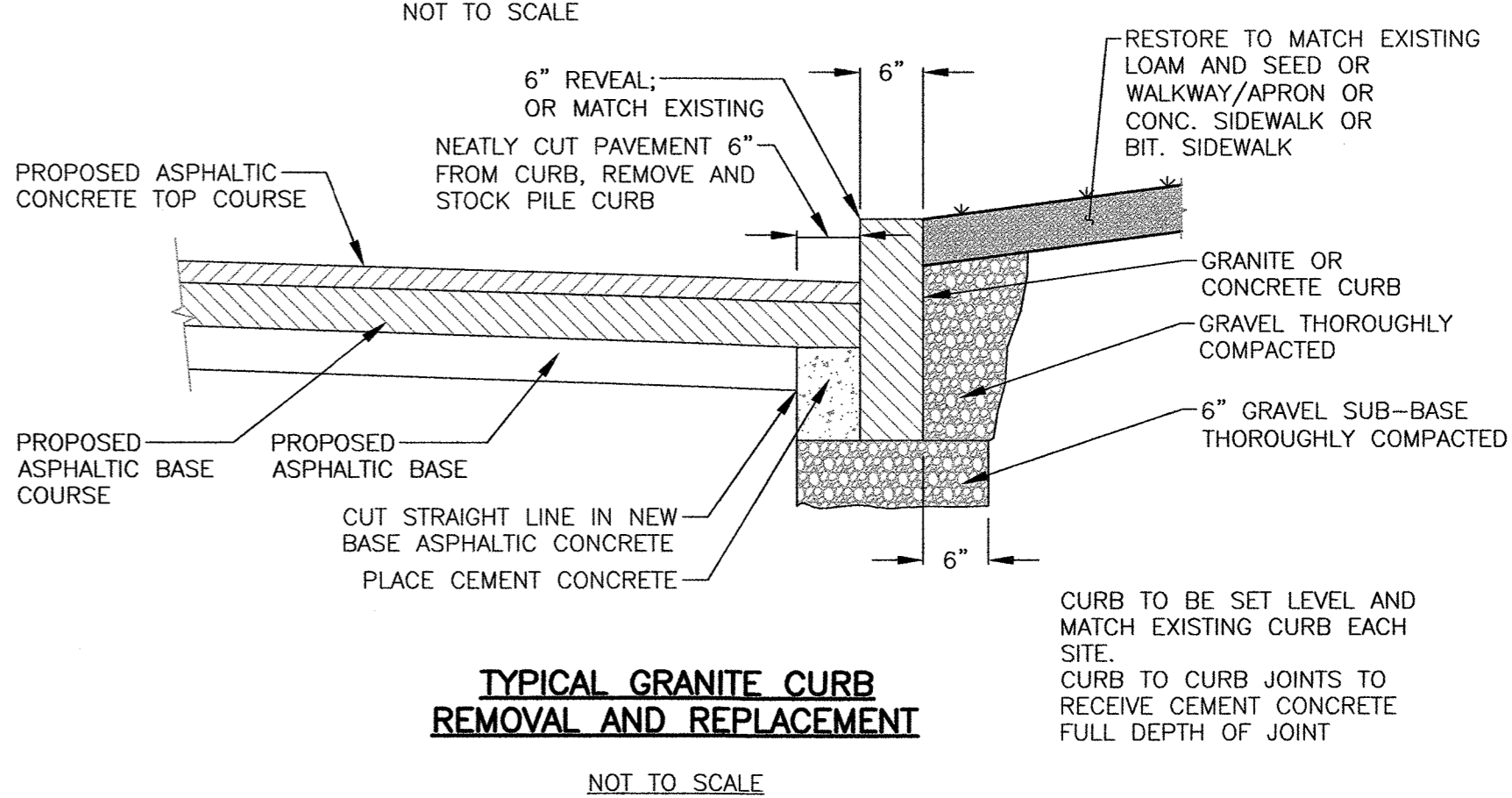
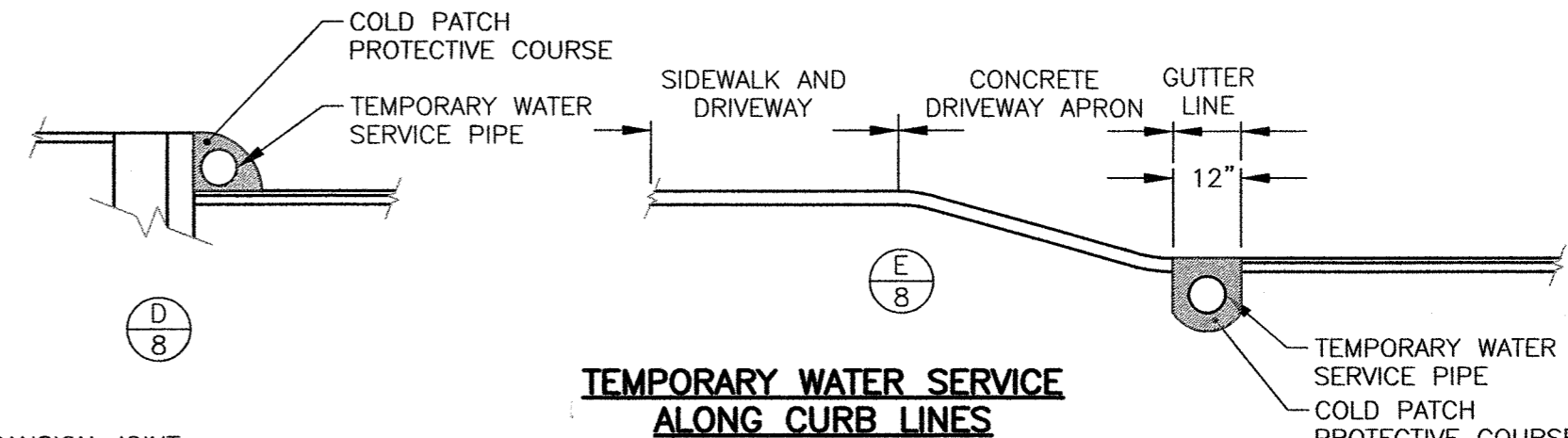
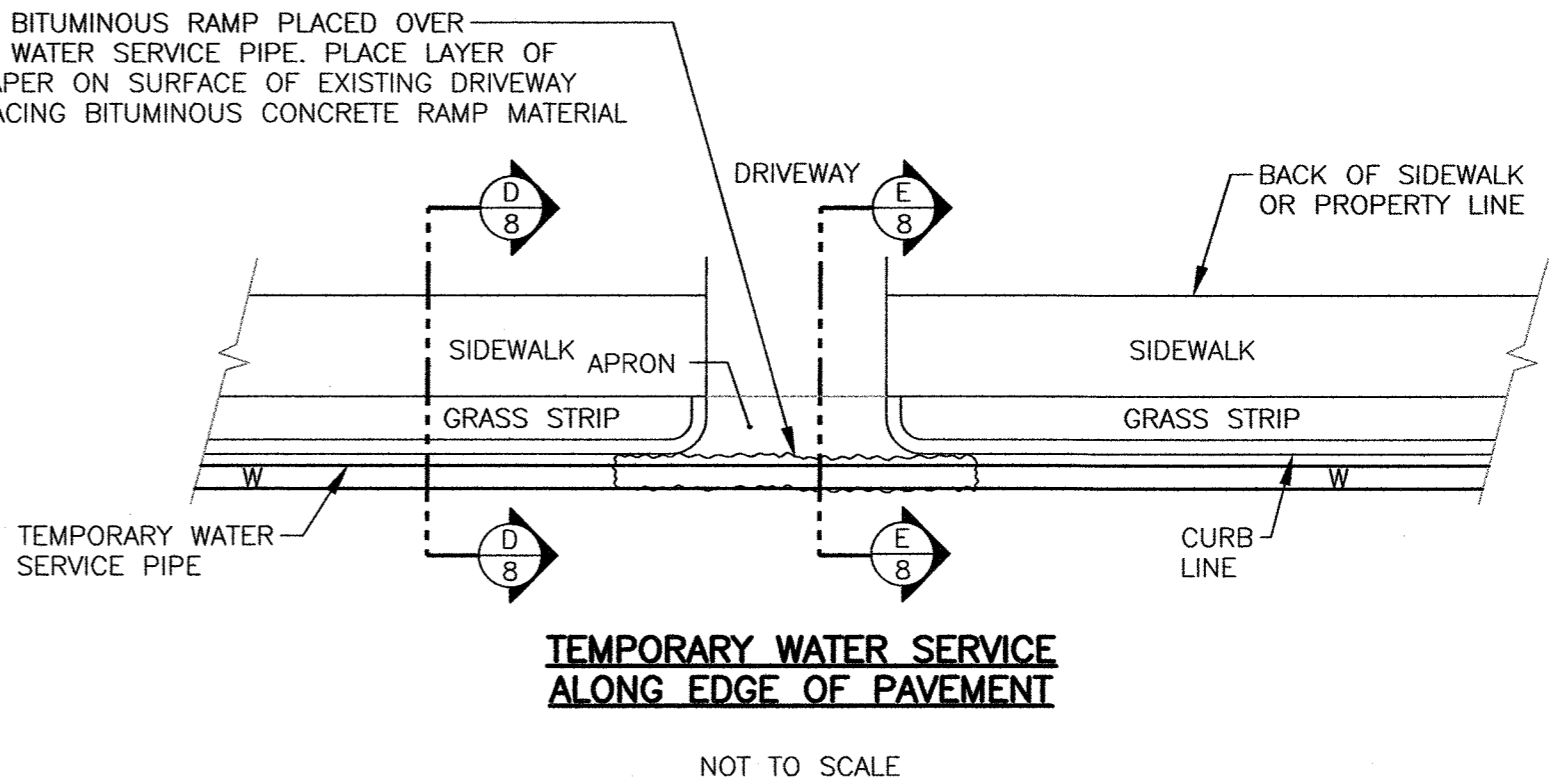
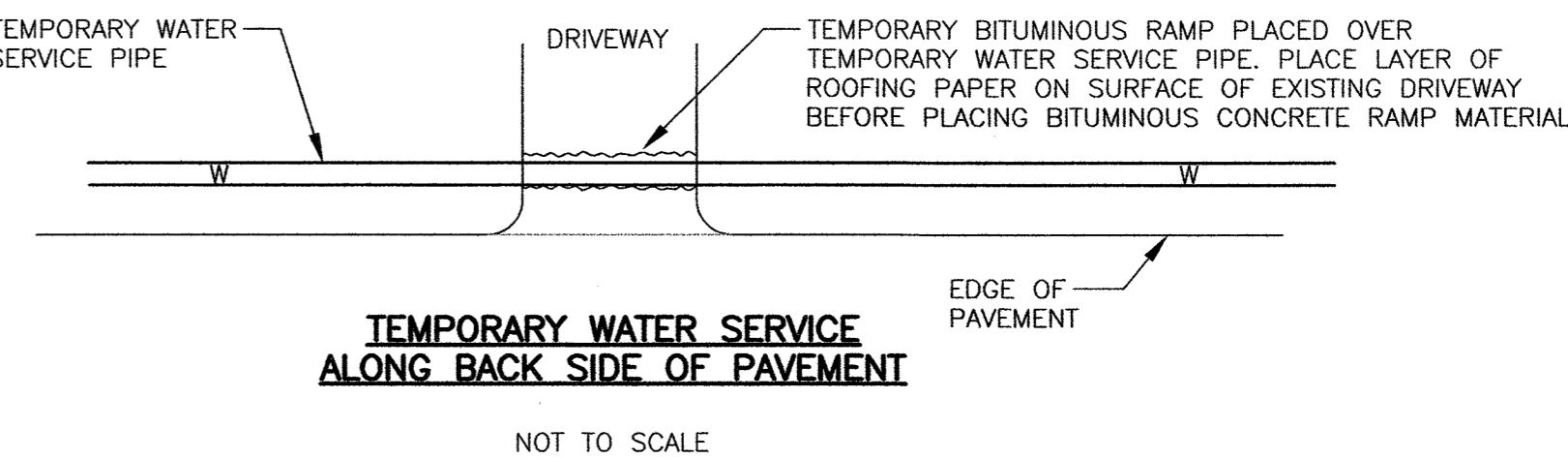


| FITTINGS         | RESTRAINED LENGTH (ft) |
|------------------|------------------------|
| 8" 90° BEND      | 31                     |
| 8" 60° BEND      | 18                     |
| 8" 45° BEND      | 13                     |
| 8" 30° BEND      | 8                      |
| 8" 22.5° BEND    | 6                      |
| 8" 11.25° BEND   | 3                      |
| 8" x 8" TEE      | 52                     |
| 10" x 8" REDUCER | 45                     |
| 8" x 6" REDUCER  | 34                     |
| 6" 90° BEND      | 26                     |
| 6" 60° BEND      | 16                     |
| 6" 45° BEND      | 10                     |
| 6" 30° BEND      | 8                      |
| 6" 22.5° BEND    | 6                      |
| 6" 11.25° BEND   | 3                      |

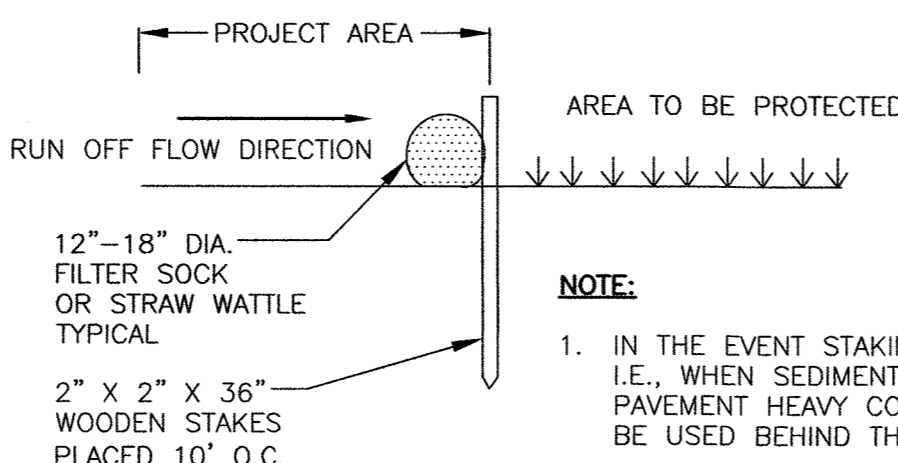
MINIMUM ONE RESTRAINED JOINT



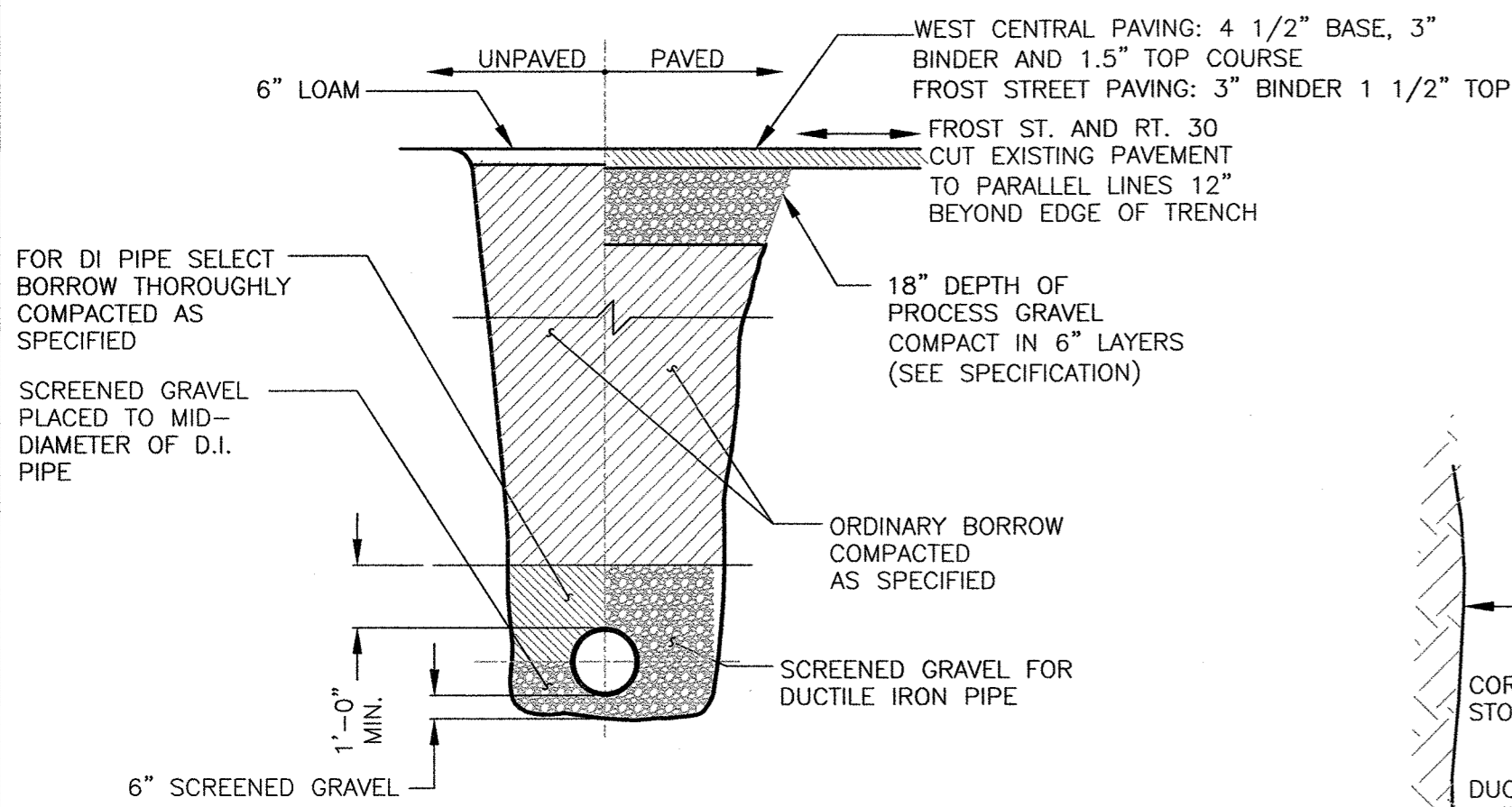
- NOTE:**  
1. WHERE WATER MAINS CROSS WITHIN 18 INCHES OF EXISTING SEWERS, THE NEW WATER MAIN SHALL HAVE MECHANICAL JOINTS (MJ) UNLESS OTHERWISE SHOWN ON THE DRAWINGS



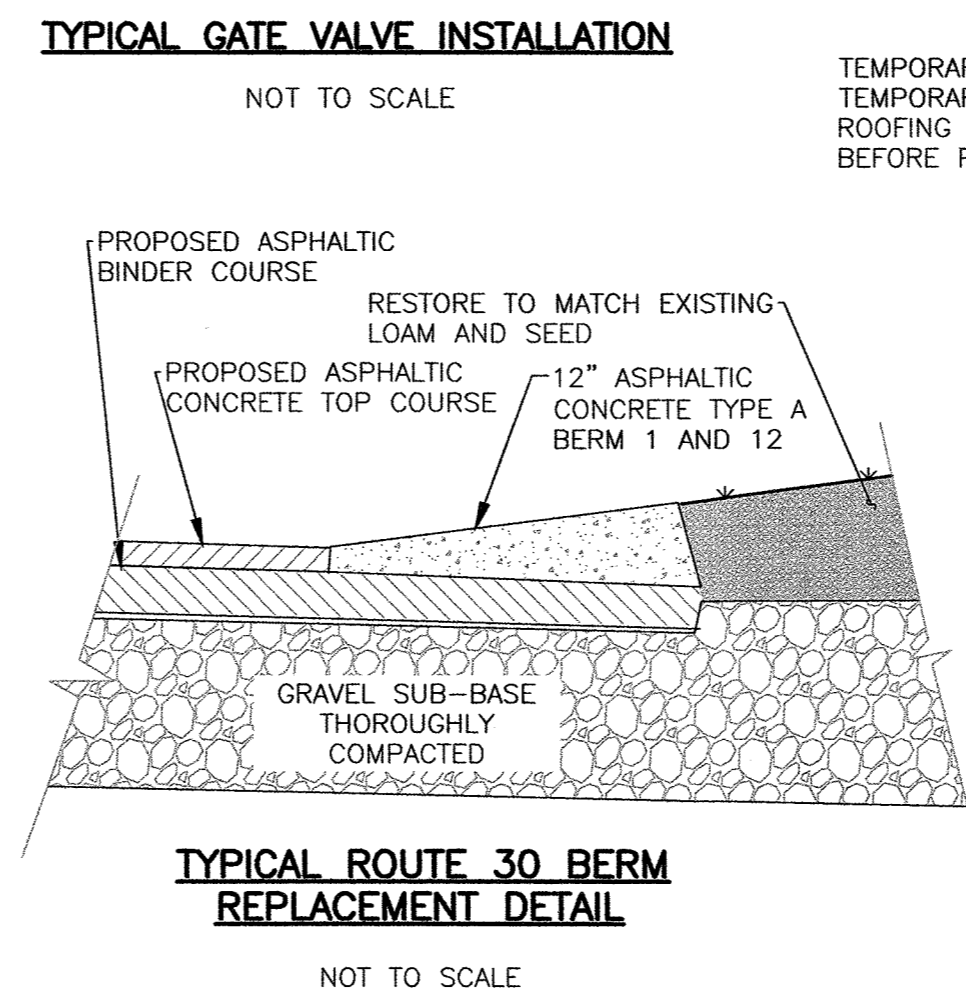
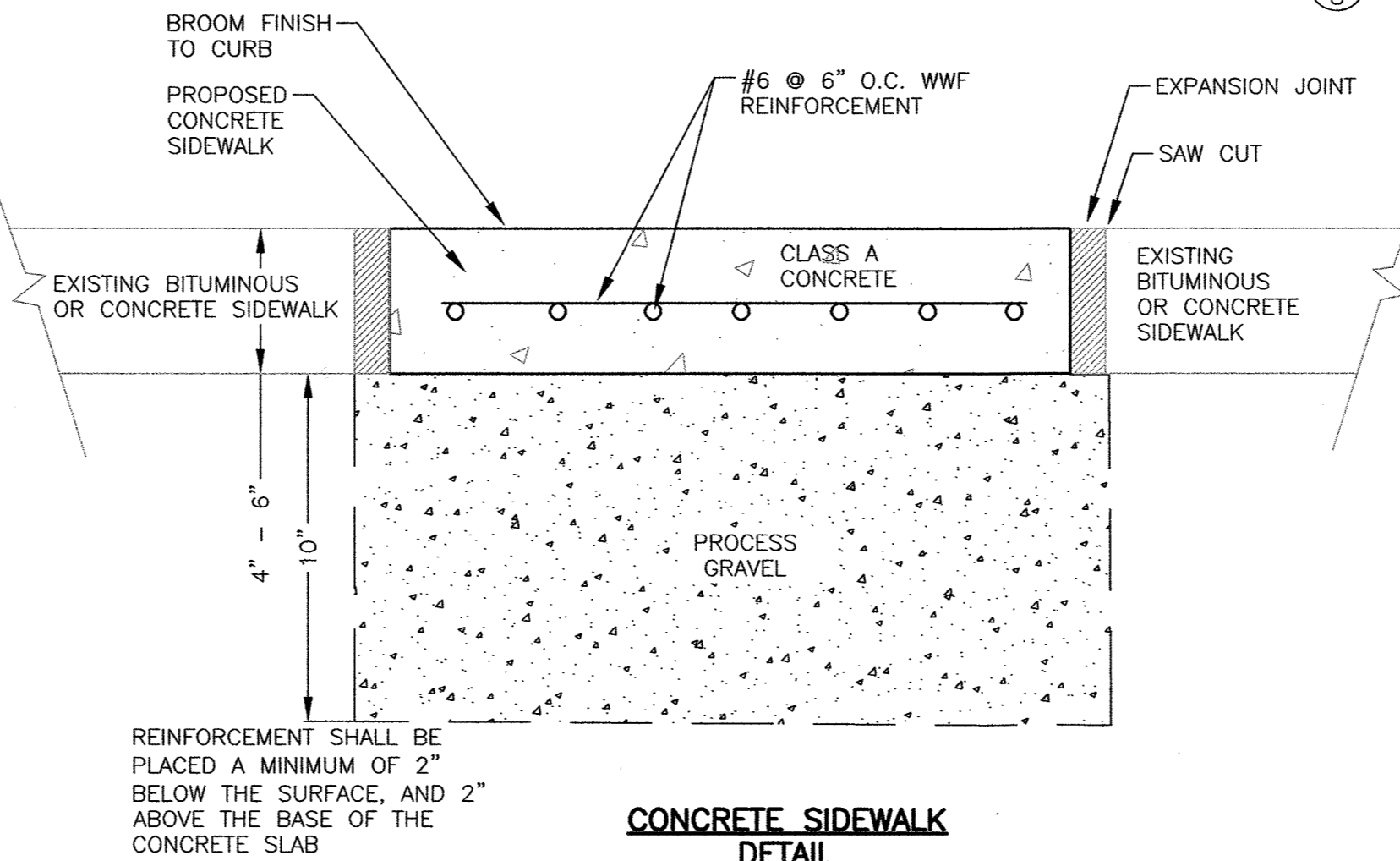
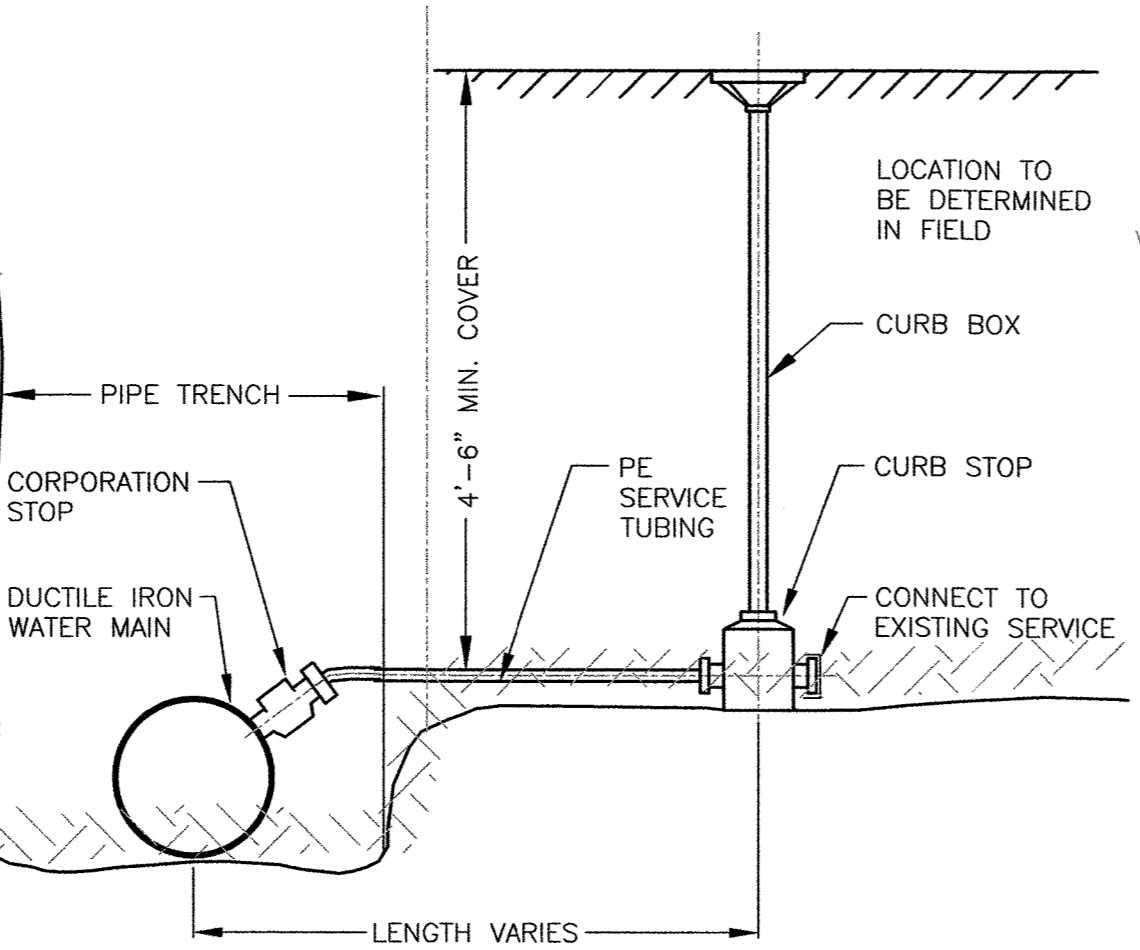
- NOTES:**  
1. HYDRANTS ARE TO BE INSTALLED WITHIN THE ROADWAY RIGHT OF WAY.  
2. FOR HYDRANTS INSTALLED AT DEAD END OF WATER MAINS: INSTALL VALVE WITH RESTRAINED JOINTS AND ONE FULL LENGTH OF PIPE BETWEEN VALVE AND HYDRANT WITH RESTRAINED JOINTS.



- NOTE:**  
1. IN THE EVENT STAKING IS NOT POSSIBLE I.E., WHEN SEDIMENT CONTROL IS USED ON PAVEMENT HEAVY CONCRETE BLOCKS SHALL BE USED BEHIND THE SEDIMENT CONTROL.



- PAVING NOTES:**  
1. CONTRACTOR TO INSTALL TEMPORARY PIT PAVEMENT.  
2. FOLLOWING REQUIRED MINIMUM TIME PERIOD CONTRACTOR TO INSTALL PERMANENT PAVEMENT.  
3. FOLLOWING REQUIRED TIME PERIOD CONTRACTOR SHALL COLD PLANE WEST CENTRAL TRENCHES AND PITS TO 1'-0" BEYOND TRENCH AND PIT LIMITS TO A DEPTH OF 1 1/2" AND INSTALL 1 1/2" DEPTH OF TOP MIX PAVEMENT.

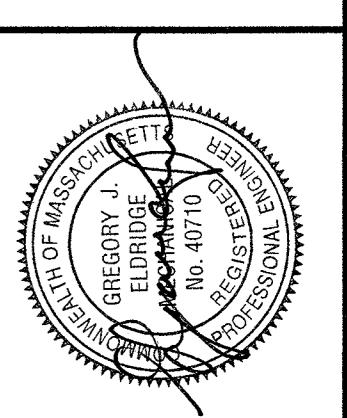


TEMPORARY BITUMINOUS RAMP PLACED OVER TEMPORARY WATER SERVICE PIPE. PLACE LAYER OF ROOFING PAPER ON SURFACE OF EXISTING DRIVEWAY BEFORE PLACING BITUMINOUS CONCRETE RAMP MATERIAL

TOWN OF NATICK, MASSACHUSETTS  
BOARD OF SELECTMEN  
**WEST CENTRAL, RT. 30  
WATER MAINS & HEALTH  
CENTER FORCEMAIN**

**WATER MAIN  
INSTALLATION  
DETAILS**

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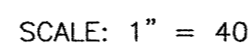
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| SHEET NO.:    | 8 OF 21         |
| CONTRACT NO.: | W-148           |
| SCALE:        | AS NOTED        |
| DATE DRAWN:   | JANUARY, 2018   |
| DRAWN BY:     | LJC             |
| FILE NO.:     | NAT-446_008.DWG |

**DWG. NO.**  
**8**

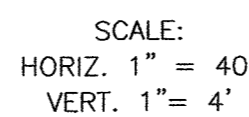
1. SEE TRAFFIC MANAGEMENT PLAN DRAWINGS FOR  
TYPICAL TRAFFIC MANAGEMENT DEVICES AND  
SIGNS AND APPROVED DETOURS.
2. THE DESIGN IS BASED ON ALLOWING FREE  
FLOWING TRAFFIC WHERE POSSIBLE.
3. THE FOLLOWING ARE RESTRICTIONS FOR TRAFFIC  
CONTROL.
  - 3.1. RUTLEDGE ROAD LEADS TO A SCHOOL  
BUILDING. ROAD MUST BE OPEN TO ONE WAY  
TRAFFIC; "IN" DURING MORNING HOURS, "OUT"  
DURING AFTERNOON HOURS, TO ALLOW BUS  
TRAFFIC DURING SCHOOL HOURS. WHEN  
SCHOOL IS OFF FOR THE SUMMER ROAD  
CLOSURE MAY BE CONSIDERED. ADDITIONAL  
SIGN FOR THE DETOUR, IF APPROVED BY  
THE OWNER, SHALL BE INCLUDED IN THE  
LUMP SUM TRAFFIC MANAGEMENT ITEM.
  - 3.2. NORTH MAIN STREET NORTHBOUND AND  
SOUTHBOUND LANES MUST BE MAINTAINED AT  
ALL TIMES WHERE POSSIBLE. THE KNOWN  
EXCEPTION IS DURING THE OPEN CUT  
REPLACEMENT SECTION, STA 1+50 TO 3+00.  
IN THIS SECTION ONE LANE ALTERNATING  
TRAFFIC MUST BE MAINTAINED. AT NO TIME  
WILL BOTH LANES BE BLOCKED FROM  
VEHICLE TRAFFIC.
4. CONTRACTOR TO FURNISH, INSTALL AND MAINTAIN  
REQUIRED TRAFFIC CONTROL DEVICES AT ALL  
TIMES DURING THE PROJECT.
  - 4.1. SIGNS THAT ARE NOT APPLICABLE AT ANY  
TIME DURING THE PROJECT, MUST BE  
REMOVED OR COVERED, TO AVOID CONFUSION  
BY DRIVERS.
5. ROAD CLOSURES MUST BE AVOIDED, UNLESS THE  
OWNER AND OR MASSDOT APPROVES OTHERWISE.  
THE DESIGN ASSUMES THE FOLLOWING RAMP  
CLOSURES.
  - 5.1. SHORT DURATION CLOSURE (4 HOURS OR  
LESS) ROUTE 9 EXIT RAMP HEADING SOUTH  
ON ROUTE 27 TO ALLOW INSTALLATION OF  
TEMPORARY BUY-PASS PIPE, MUST BE  
COMPLETE ON SATURDAY OR AFTER 10 PM  
DURING THE WEEKDAYS.
  - 5.2. SHORT DURATION CLOSURE (4 HOURS OR  
LESS) ROUTE 9 ENTRANCE RAMP FROM  
ROUTE 27 SOUTHBOUND TO ALLOW  
INSTALLATION OF TEMPORARY BY-PASS  
PIPING, MUST BE COMPLETE ON SATURDAY OR  
AFTER 10 PM ON WEEKDAYS.
  - 5.3. ROUTE 9 EXIT RAMP ONTO ROUTE 27  
NORTHBOUND, DURING THE SEWER  
REPLACEMENT STA 7+00 TO 11+00  
(INCLUDES PIPE BURSTING SEGMENT) MUST  
BE COMPLETE ON SATURDAY OR AFTER 10  
PM ON WEEKDAYS.
6. CONTRACTOR SHALL FURNISH ELECTRONIC  
MESSAGE BOARD AS REQUIRED BY THE CONTRACT  
DOCUMENTS. IN GENERAL THE SIGN MUST BE  
INSTALLED MINIMUM OF 2 WEEKS PRIOR TO  
START OF CONSTRUCTION, AND AT TIMES DURING  
THE PROJECT AS REQUIRED BY THE OWNER.
7. PEDESTRIAN TRAFFIC MUST ALSO BE PROTECTED  
BY THE CONTRACTOR'S OPERATION. ALTERNATIVE  
SIDEWALK MUST BE PROVIDED BY THE  
CONTRACTOR WHERE EXISTING SIDEWALKS ARE  
REMOVED DURING THE PROJECT. APPROPRIATE  
SIGNS MUST BE INSTALLED IDENTIFYING THE  
ALTERNATIVE SIDEWALK AND THE CLOSED  
SIDEWALK.

1. DURING FORCE MAIN REPLACEMENT, CONTRACTOR TO INSTALL ALL REQUIRED BYPASS PIPING, PUMPS IF NECESSARY, TO CARRY WASTEWATER FROM THE HEALTH CENTER PUMP STATION TO AN EXISTING GRAVITY SEWER ON NORTH MAIN STREET OR AS SELECTED BY THE CONTRACTOR.
- 1.1. IN ADDITION TO THE FOREMAN, THERE ARE TWO SEWER SERVICES CONNECTED TO THE FOREMAN. CONTRACTOR SHALL INSTALL BY-PASS TO ALLOW THE TWO BUILDING'S PUMP STATIONS TO DISCHARGE INTO THE TEMPORARY BY-PASS MAIN.
2. DURING SMH INSTALLATION, CONTRACTOR TO INSTALL ALL REQUIRED BYPASS PIPING AND PUMPS TO CARRY WASTEWATER FROM THE EXISTING GRAVITY SMH TO AN EXISTING DOWNSTREAM GRAVITY SEWER MANHOLE ON NORTH MAIN STREET OR AS SELECTED BY THE CONTRACTOR.
3. THE CONTRACTOR SHALL BE REQUIRED TO SUBMIT TO THE ENGINEER FOR APPROVAL, ALL PROVISIONS SET FORTH IN SECTION 03232 "BY-PASS PUMPING OF MAIN LINE WASTEWATER" AND SECTION 03235 "BY-PASS PUMPING OF FOREMAN WASTEWATER" OF THE SPECIFICATIONS AND TO SET UP TEST AND MAINTAIN A BY-PASS PUMP AND PIPING SYSTEM OF SIZES AND CAPACITIES TO MEET ALL OF THE REQUIREMENTS OF THE SPECIFICATIONS REFERENCED ABOVE, BEFORE ANY EXCAVATION AND SEWER MAIN REPLACEMENT WILL BE ALLOWED TO BEGIN.
4. BY-PASS PUMPING SYSTEM SHALL BE INSTALLED AND TESTED AS REQUIRED BY THE CONTRACT DOCUMENTS PRIOR TO EXCAVATING FOR NEW FOREMAN. CONTRACTOR TO PREPARE AND SUBMIT FOR APPROVAL A BY-PASS EMERGENCY ACTION PLAN FOR BY-PASS SYSTEM FAILURES.
5. ALL BYPASS PIPING TO BE RECESSED INTO PAVEMENT AT ALL STREET CROSSINGS AND BUSINESS DRIVEWAY CROSSINGS. ALL RESIDENTIAL HOUSE DRIVEWAY CROSSINGS TO BE RAMPED WITH COLD PATCH, PROVIDED THE RAMP ALLOWS EASY ACCESS BY CARS WITHOUT POSSIBLE DAMAGE TO CARS. IF DRIVEWAY COLD PATCH RAMP IS TOO HIGH FOR CARS, CONTRACTOR TO BURY BY-PASS PIPE BELOW THESE DRIVEWAYS.
6. FLOWING OF WASTEWATER ACROSS SEWER TRENCH, DISPOSAL OF WASTEWATER OVERLAND INTO WETLAND AREAS OR INTO DRAINAGE SYSTEM WILL NOT BE PERMITTED.
7. CONTRACTOR TO RECEIVE APPROVAL FOR BY-PASS PIPING DE-WATERING AND DISASSEMBLY. CONCENTRATION ON NOT ALLOWING WASTEWATER TO FLOW OVER THE GROUND IS IMPERATIVE. PIPING SYSTEM MUST BE FLOWED AND TESTED WITH CLEAN WATER TO REMOVE WASTEWATER AND SEDIMENTS FROM THE WASTEWATER.

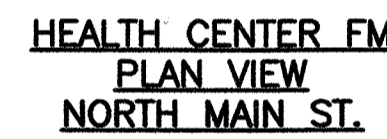
1. DUE TO FOURTH OF JULY PARADE, NO ROADWAY PLATES, UN-PAVED TRENCHES, EQUIPMENT OR BY-PASS PIPING SHALL BE IN ROADWAY OR ALONG PROPERTY LINES, BETWEEN JULY 1ST AND JULY 5TH.



1. THE DRAWING ORIGIN IS THE TOWN OF NATICK GIS MAP. EXISTING FEATURES WERE ALSO PULLED FROM THE MASSDOT NORTH MAIN STREET ROAD RECONSTRUCTION BASE DRAWING.

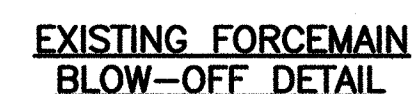


1. DUE TO FOURTH OF JULY PARADE, NO ROADWAY PLATES, UN-PAVED TRENCHES, EQUIPMENT OR BY-PASS PIPING SHALL BE IN ROADWAY OR ALONG PROPERTY LINES, BETWEEN JULY 1ST AND JULY 5TH.



DRAWING ORIGIN

THE DRAWING ORIGIN IS THE TOWN OF NATICK GIS  
MAP. EXISTING FEATURES WERE ALSO PULLED FROM  
THE MASSDOT NORTH MAIN STREET ROAD  
RECONSTRUCTION BASE DRAWING.



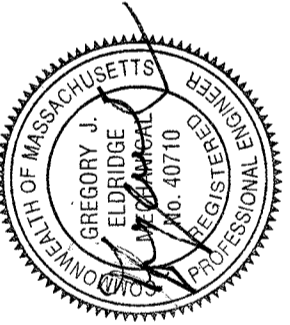
HEALTH CENTER FM  
PROFILE VIEW  
NORTH MAIN ST.

SCALE:  
HORIZ. 1" = 40'  
VERT. 1" = 4'

**WEST CENTRAL, RT 30  
WATER MAINS AND HEALTH  
CENTER FORCEMAIN**

63 GREAT ROAD SUITE 200

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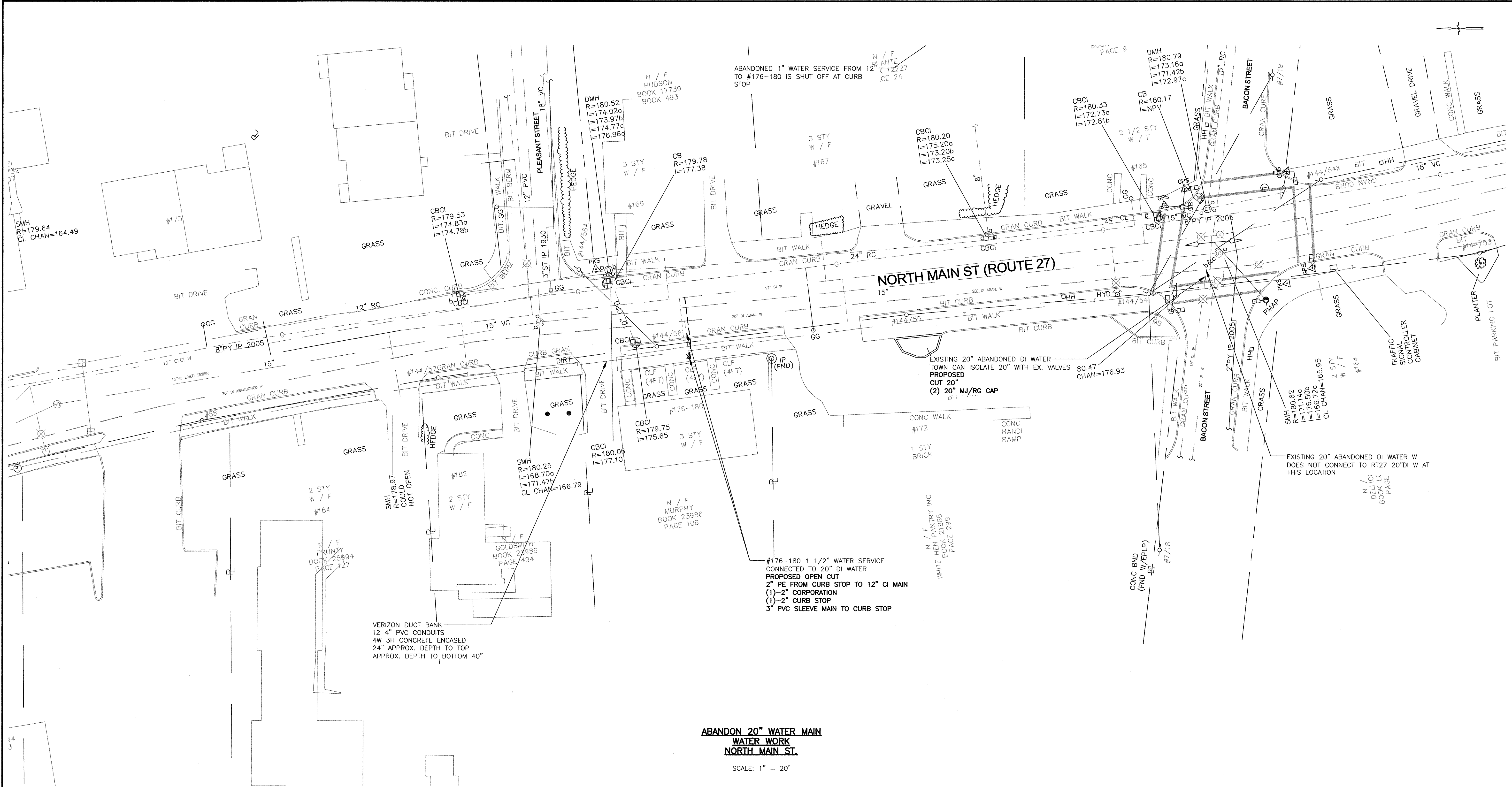


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|---------------|------------------|---------|------|----|--|
| SHEET NO.:    | NO OF ZONE       |         |      |    |  |
| CONTRACT NO.: | W-148            |         |      |    |  |
| SCALE:        | AS NOTED         | REVISED | DATE | BY |  |
| DATE DRAWN:   | FEBRUARY 2018    |         |      |    |  |
| DRAWN BY:     | LJC              |         |      |    |  |
| FILE NO.:     | NAT_451_BASE.DWG |         |      |    |  |

DWG. NO. \_\_\_\_\_

10

J:\Natick\451\_Rt 9 & 27 Utility replacement\Cadd\NAT\_451\_BASE.dwg, 3/28/2018 2:12:10 PM

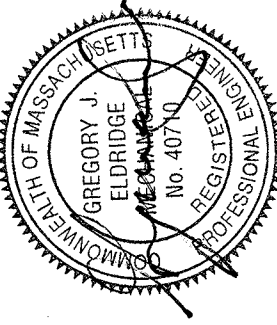


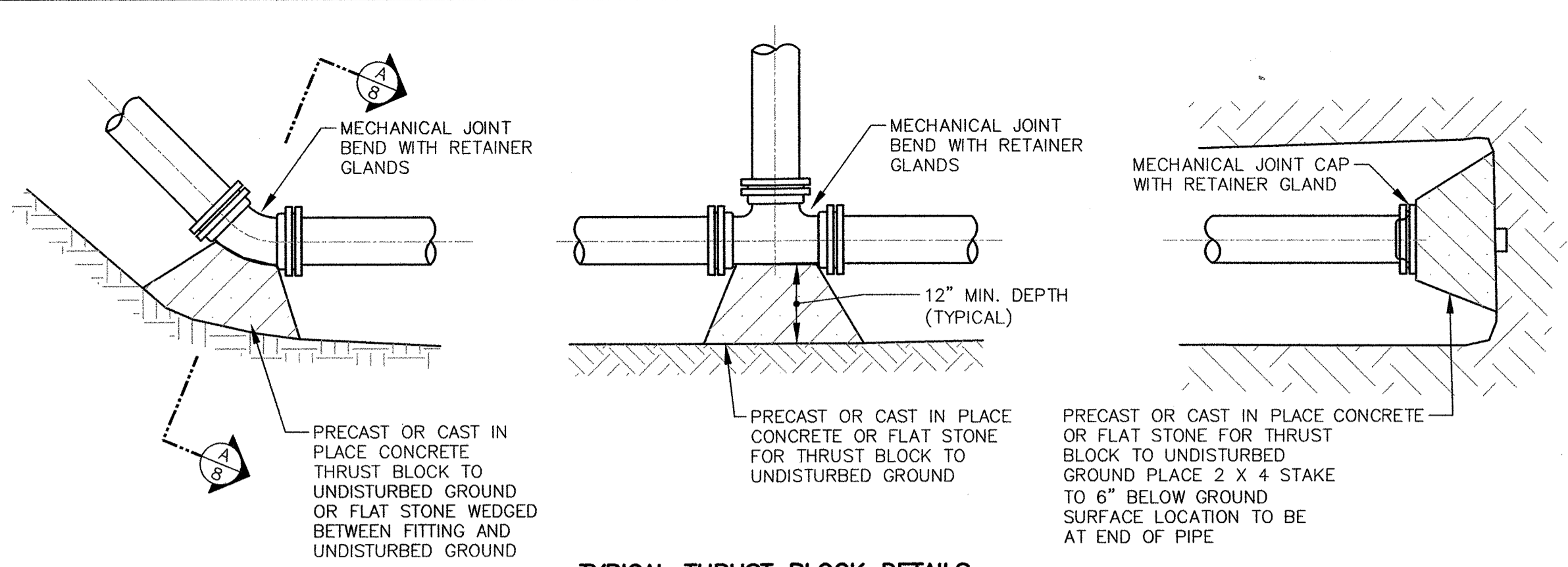
**NORTH MAIN STREET PROJECT WORK CONSTRAINT:**

1. DUE TO FOURTH OF JULY PARADE, NO ROADWAY PLATES, UN-PAVED TRENCHES, EQUIPMENT OR BY-PASS PIPING SHALL BE IN ROADWAY OR ALONG PROPERTY LINES, BETWEEN JULY 1ST AND JULY 5TH.
2. WORK ON THIS DRAWING TO BE COMPLETED AT NIGHT, AFTER 7:00 PM OR ON SATURDAY.

**DRAWING ORIGIN**

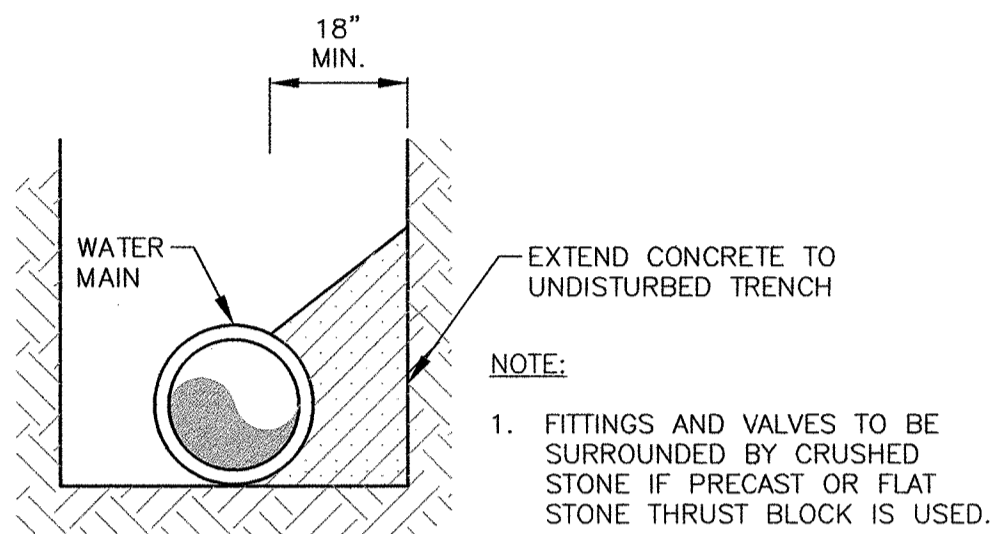
1. THE DRAWING ORIGIN IS THE TOWN OF NATICK GIS MAP. EXISTING FEATURES WERE ALSO PULLED FROM THE MASSDOT NORTH MAIN STREET ROAD RECONSTRUCTION BASE DRAWING.

|  |      |  |      |
|--|------|--|------|
| TOWN OF NATICK, MASSACHUSETTS<br>BOARD OF SELECTMEN  |      | <b>WEST CENTRAL, RT 30<br/>WATER MAINS AND HEALTH<br/>CENTER FORCEMAIN</b> |      |
| <b>NORTH MAIN WATER<br/>MISCELLANEOUS WORK</b>   |      |  |      |
| <b>Haley and Ward, Inc.</b><br>63 GREAT ROAD, SUITE 200<br>MAYNARD, MASSACHUSETTS 01754-2097<br>PHONE: (978) 648-6025 FAX: (978) 648-6088<br>www.haleyward.com |      |  |      |
|   |      |  |      |
| CHECKED  | DATE | BY   | DATE |
| REVIEWED   | DATE | BY   | DATE |
| SHEET NO.: 11 OF 21  |      | CONTRACT NO.: W-148  |      |
| SCALE: AS NOTED  |      | DATE DRAWN: FEBRUARY 2018  |      |
| DRAWN BY: LJC  |      | FILE NO.: NAT_451_BASE.DWG   |      |
| <b>DWG. NO.</b>  |      |  |      |
| <b>11</b>  |      |  |      |



| PIPE DIAMETER | BENDS |      |     |     | TEE |
|---------------|-------|------|-----|-----|-----|
|               | 11.25 | 22.5 | 45  | 90  |     |
| 6             | 1     | 1    | 1   | 2   | 1.5 |
| 8             | 1     | 1    | 2   | 3   | 2.5 |
| 12            | 1     | 2    | 3.5 | 6.5 | 5   |

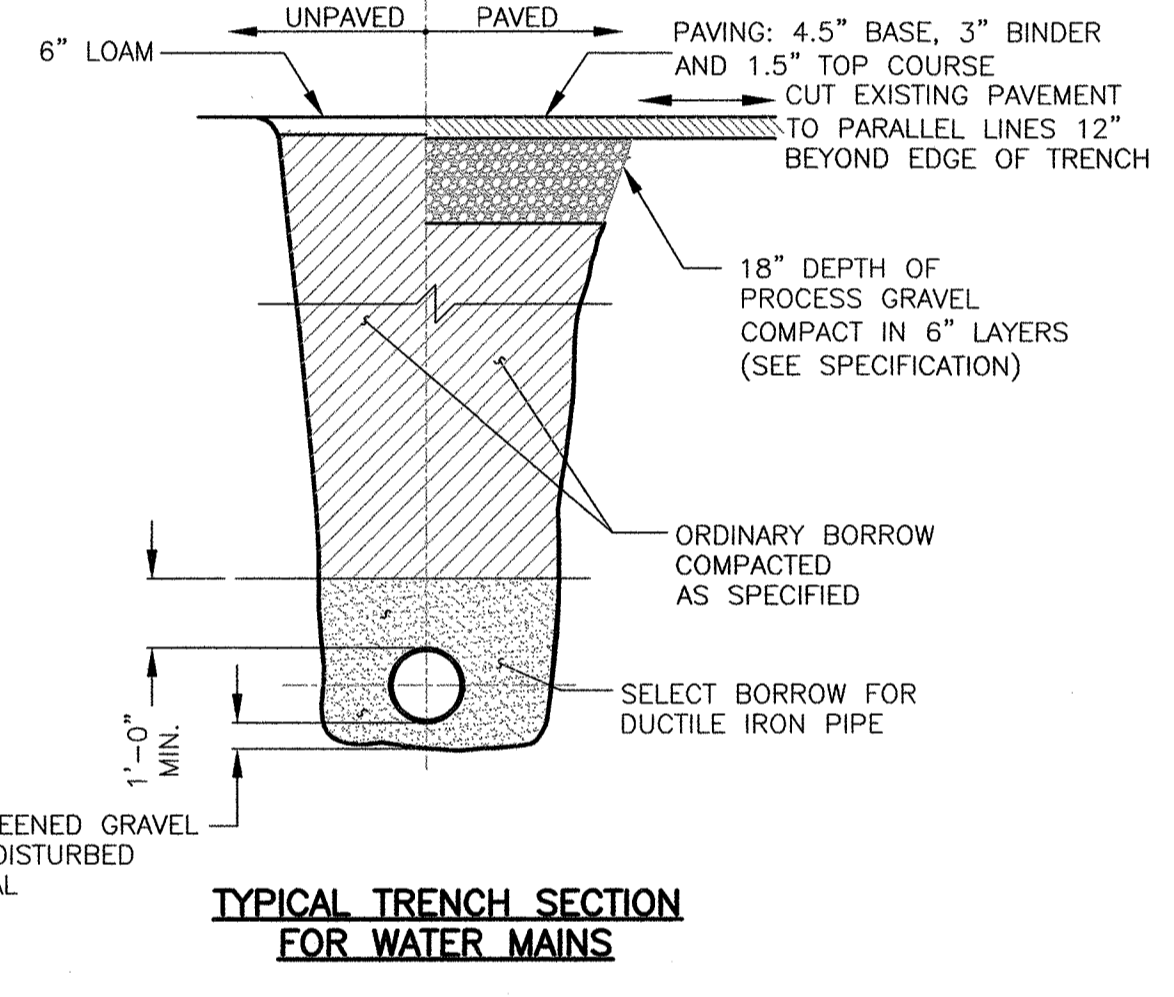
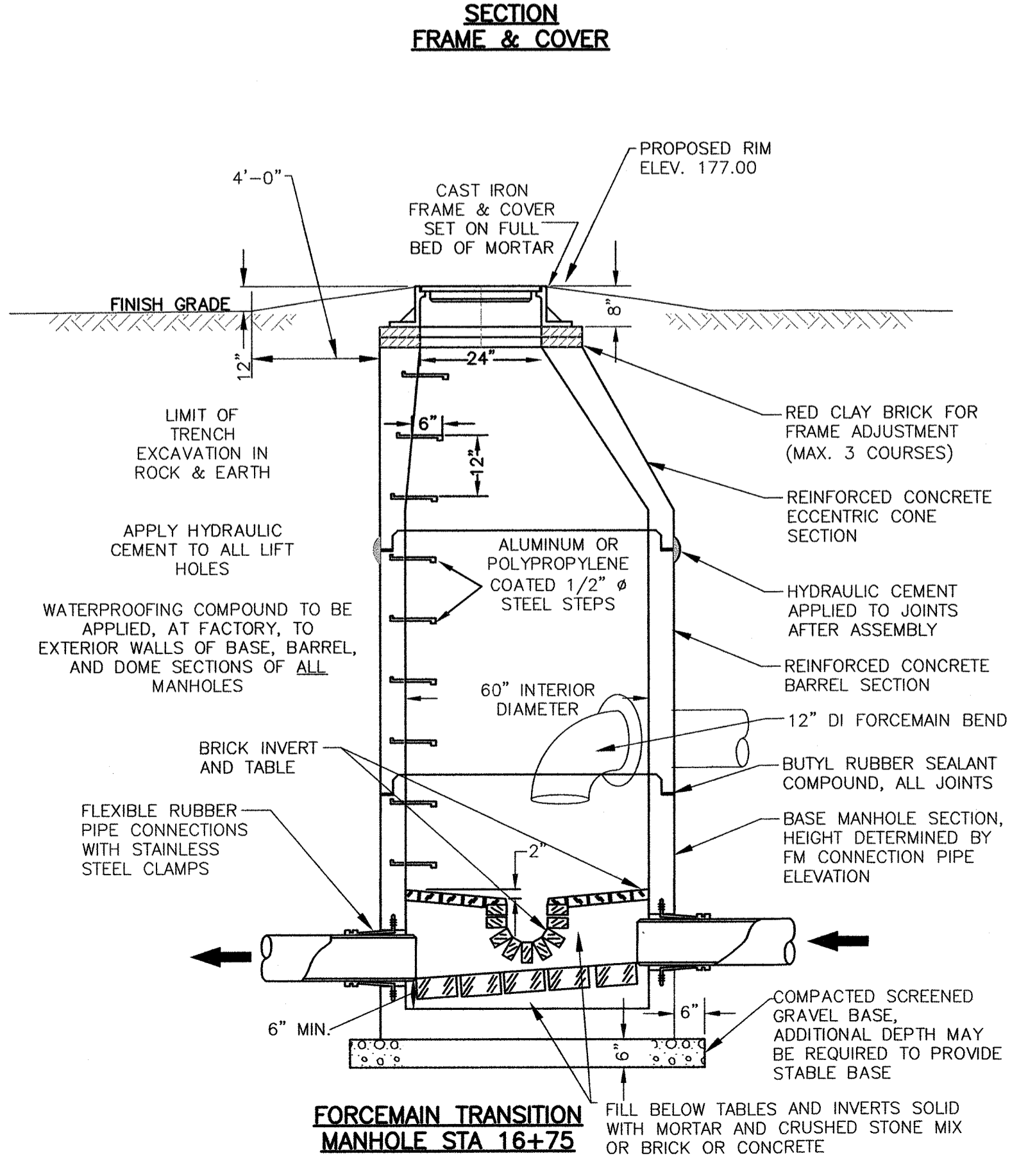
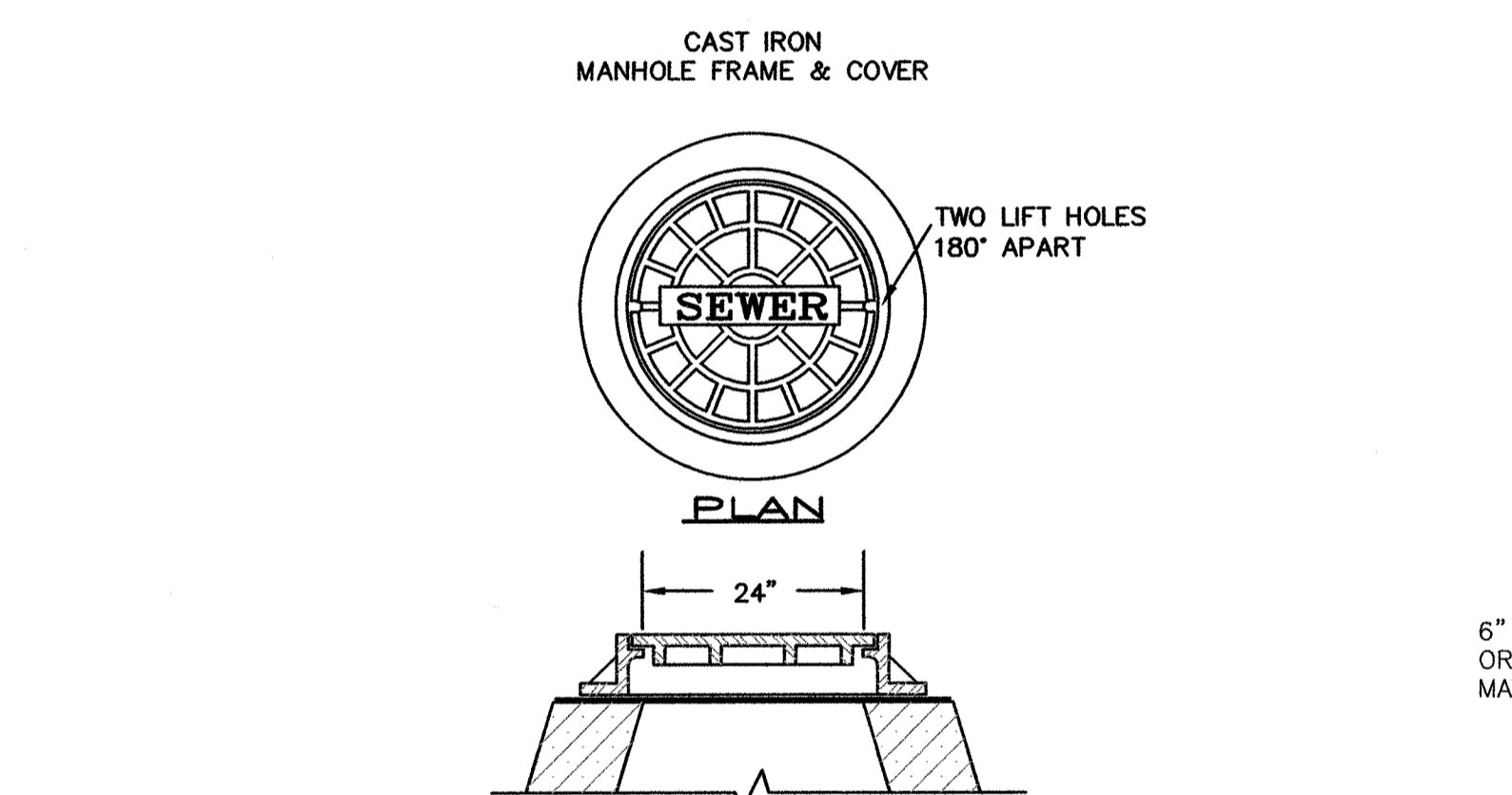
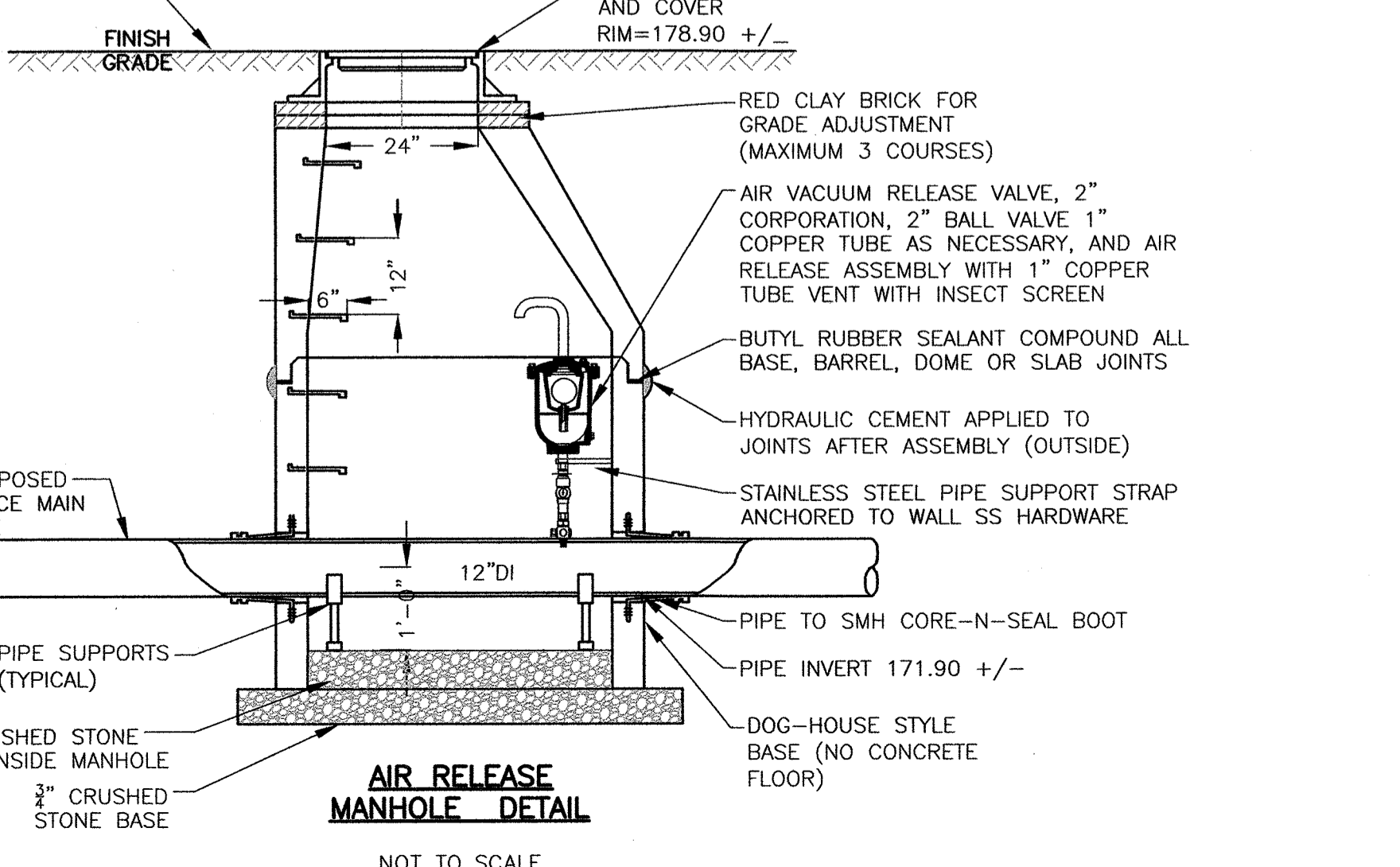
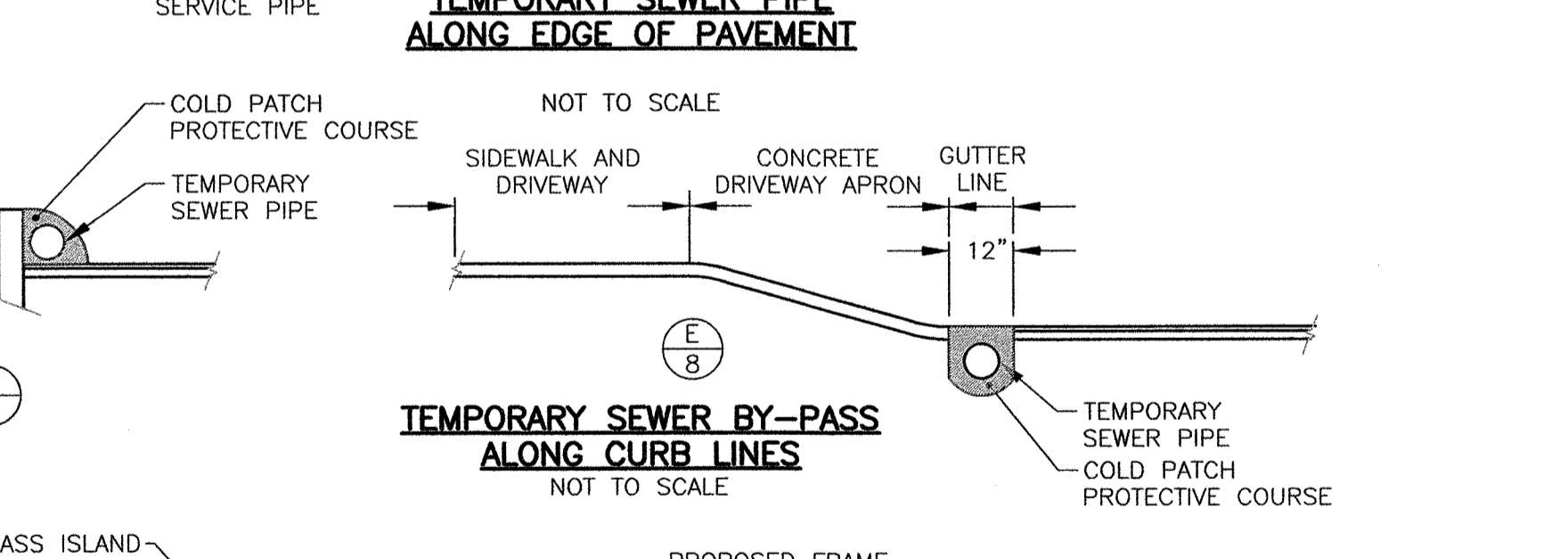
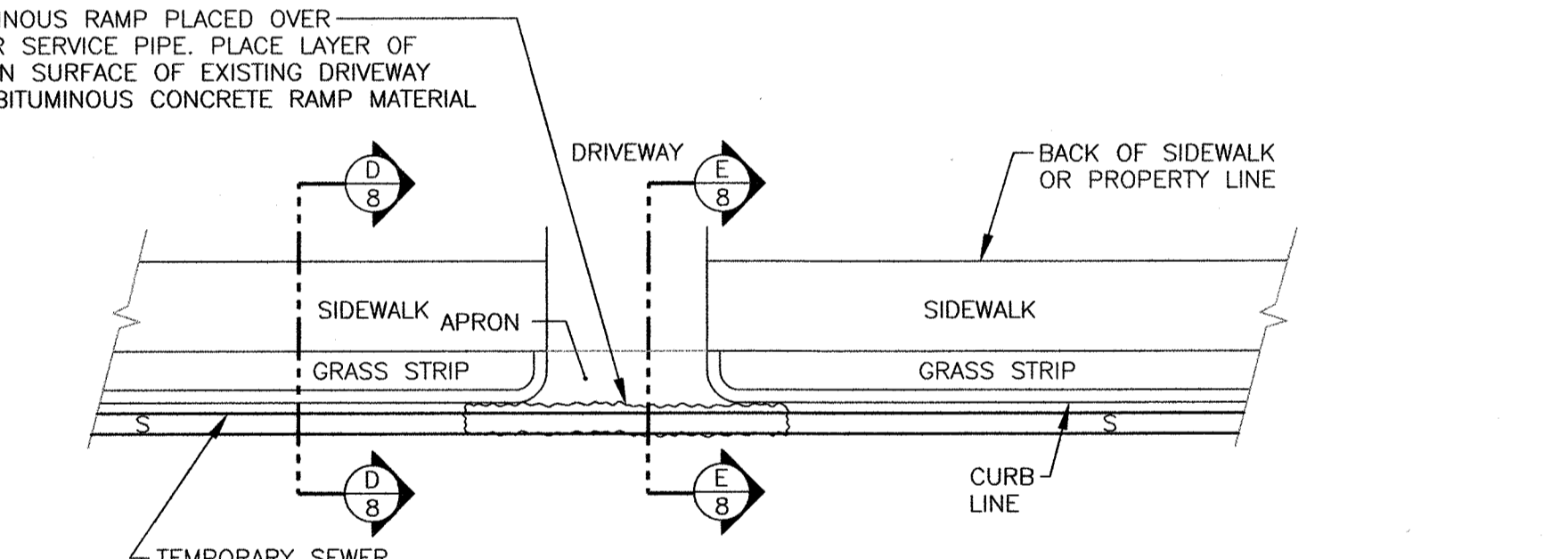
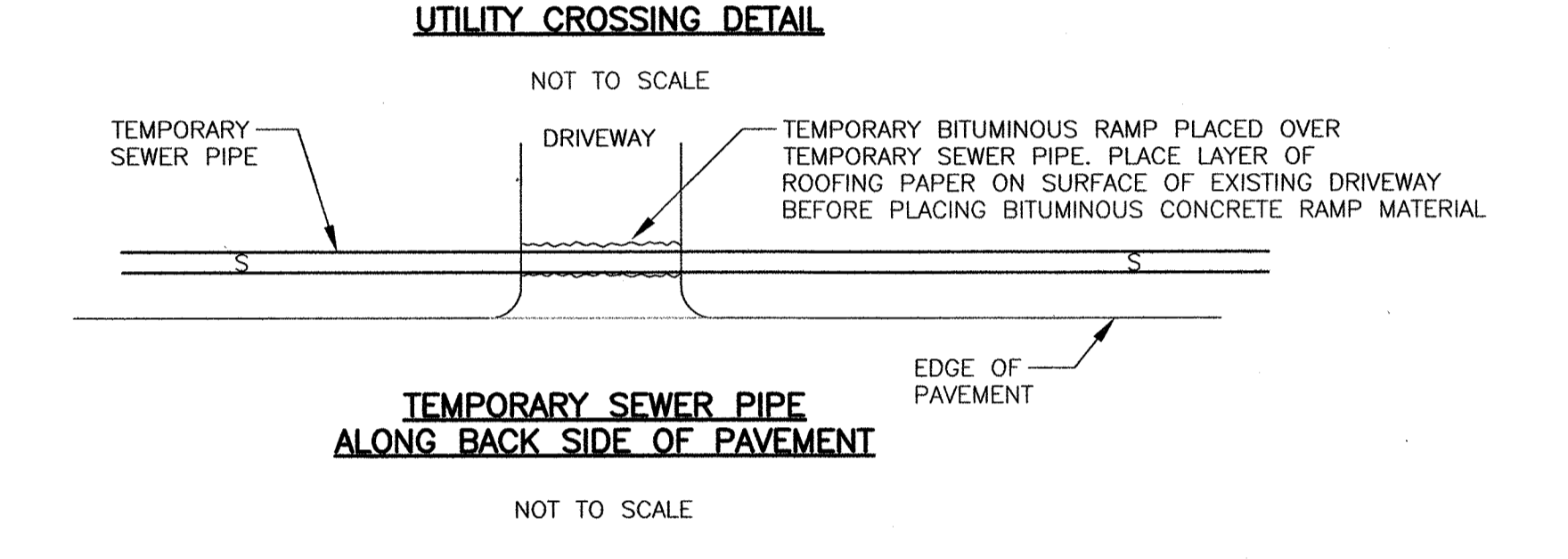
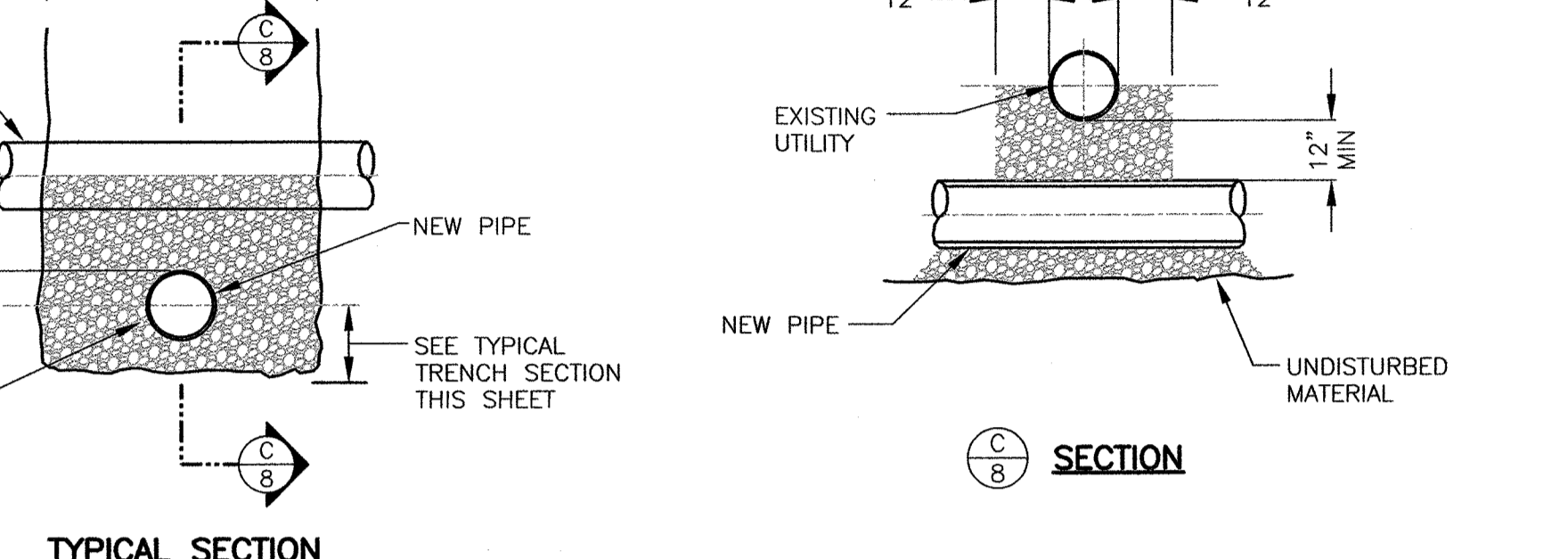
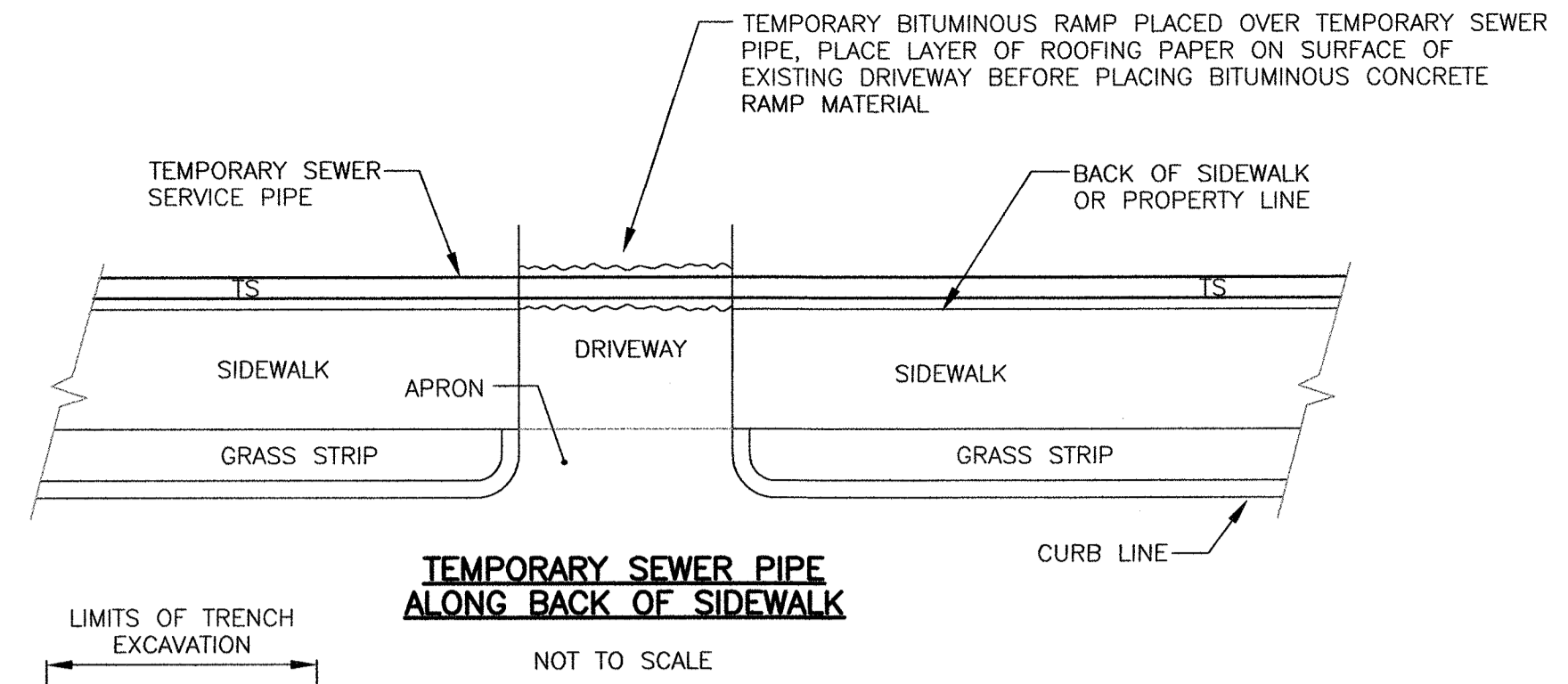
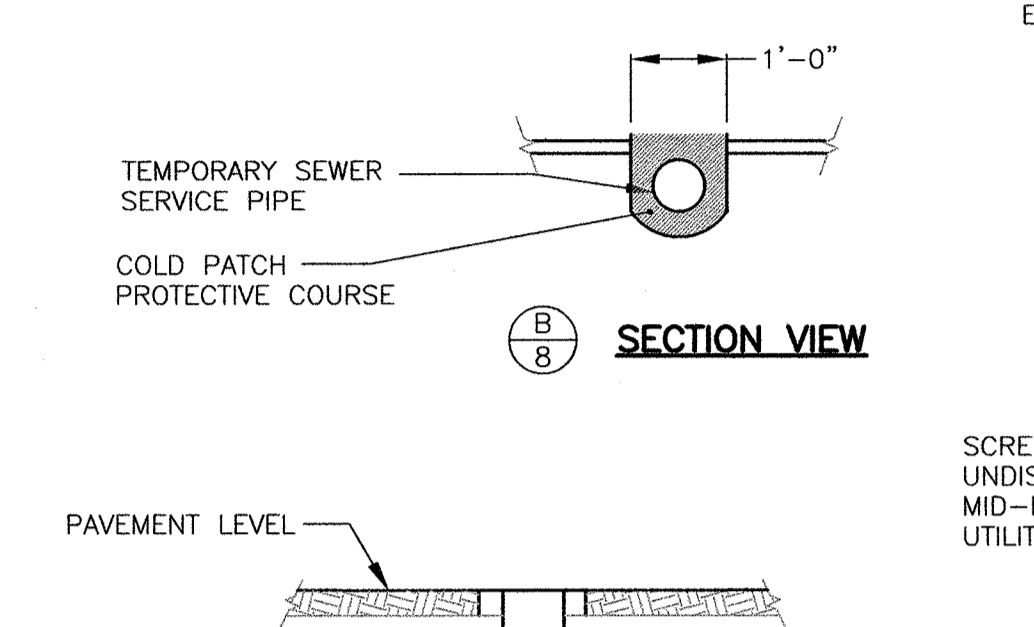
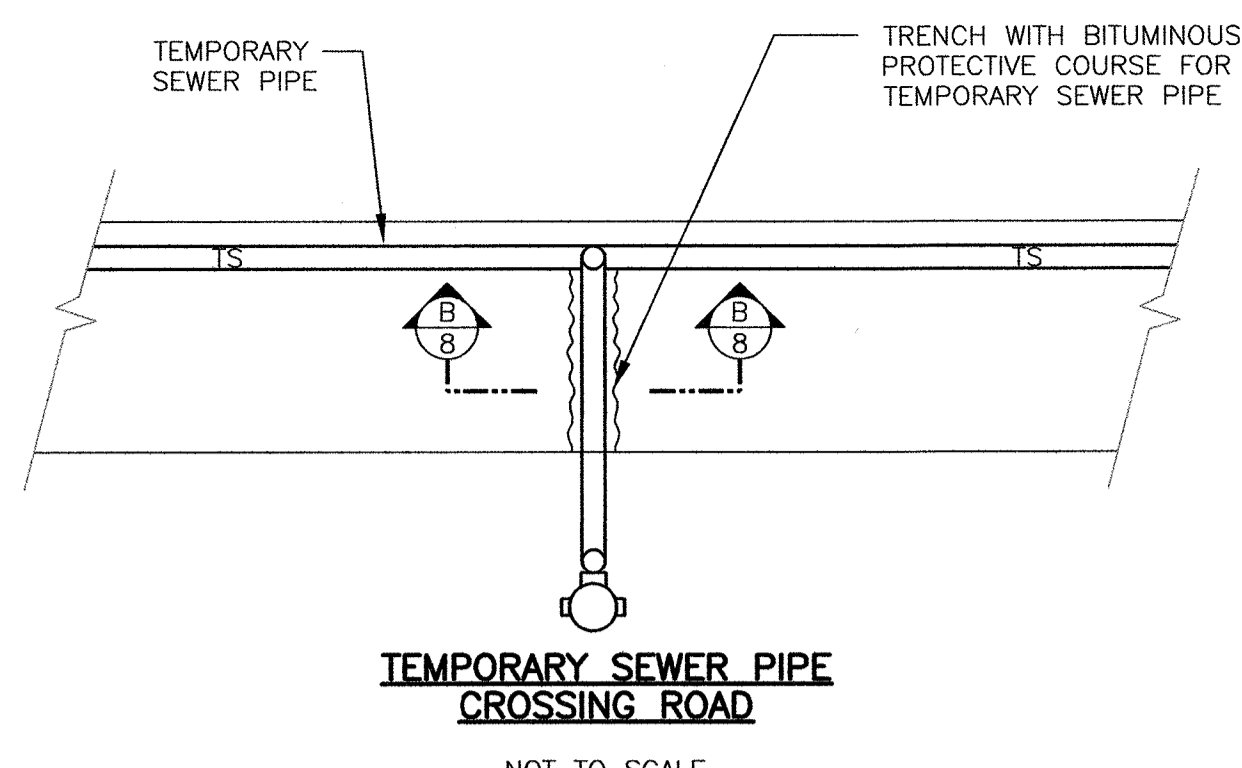
THRUST BLOCK BEARING AREA (SF)  
(BASED UPON 100 PSI WATER PRESSURE  
AND 3000 PSF BEARING LOAD CAPACITY)



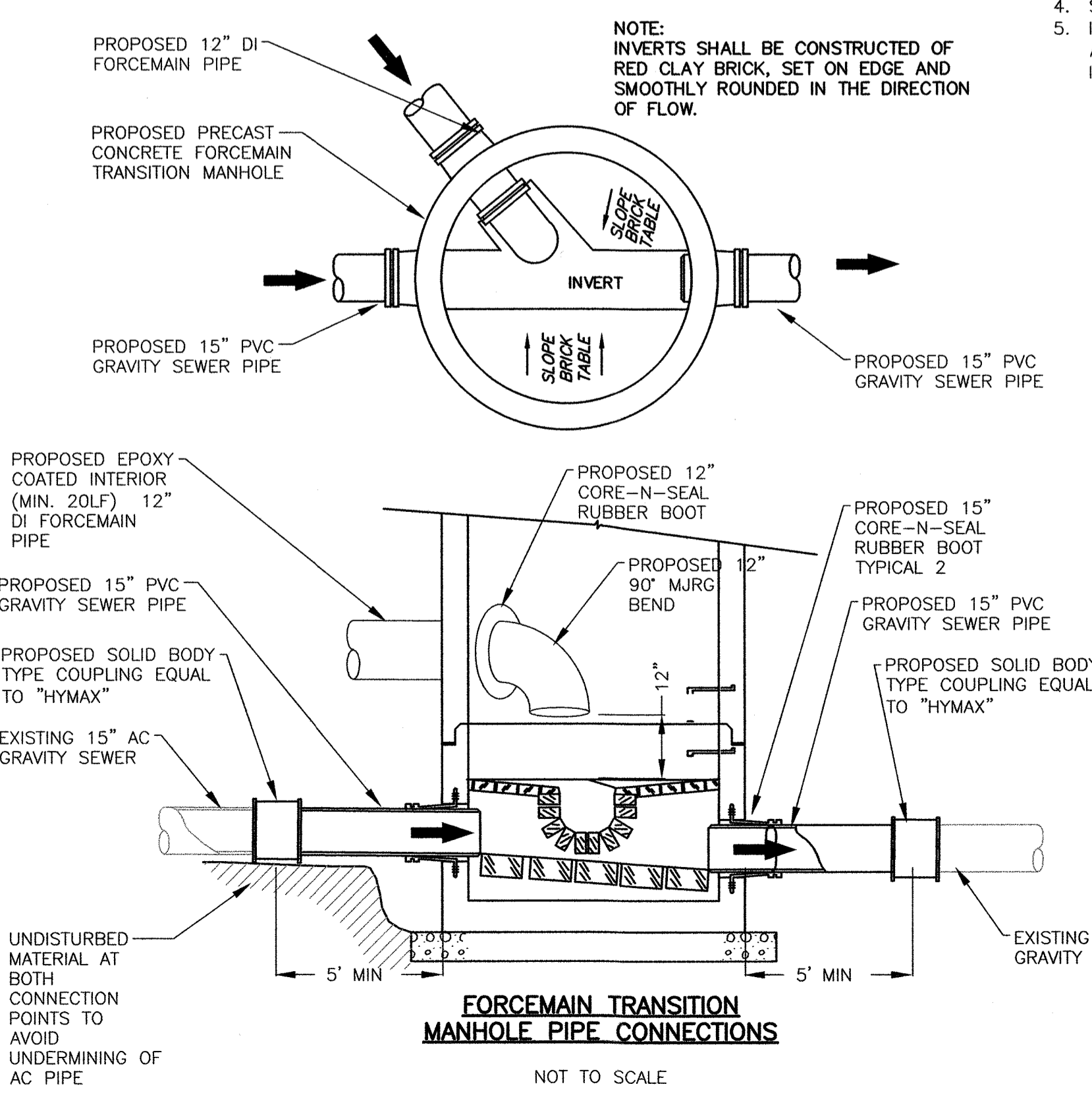
NO SCALE

| FITTINGS         | RESTRAINED LENGTH (ft) |
|------------------|------------------------|
| 8" 90° BEND      | 31                     |
| 8" 60° BEND      | 18                     |
| 8" 45° BEND      | 13                     |
| 8" 30° BEND      | 8                      |
| 8" 22.5° BEND    | 6                      |
| 8" 11.25° BEND   | 3                      |
| 8" x 8" TEE      | 52                     |
| 10" x 8" REDUCER | 45                     |
| 8" x 6" REDUCER  | 34                     |
| 6" 90° BEND      | 26                     |
| 6" 60° BEND      | 16                     |
| 6" 45° BEND      | 10                     |
| 6" 30° BEND      | 8                      |
| 6" 22.5° BEND    | 6                      |
| 6" 11.25° BEND   | 3                      |

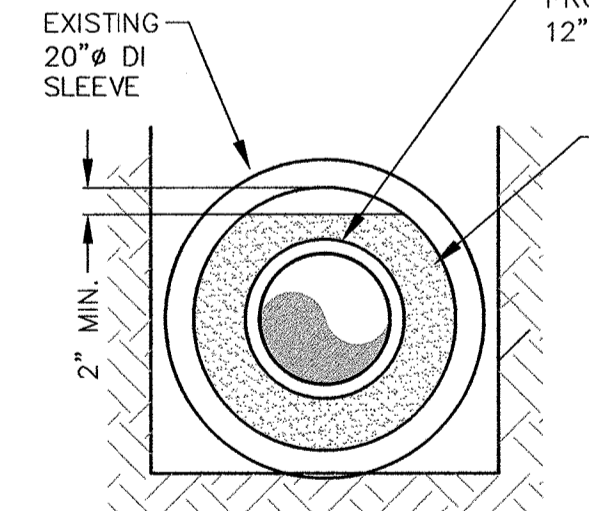
MINIMUM ONE RESTRAINED JOINT



NOTE:  
CONTRACTOR TO INSTALL A TACK COAT/SAND SEAL ON ALL EDGES OF TRENCH PATCH.



- SLIPLINE NOTES:**
- CONTRACTOR TO INSPECT THE 20" DI PIPE WITH A TV CAMERA SYSTEM, OR VISUAL INSPECTION IF POSSIBLE, PRIOR TO INSERTING 12" PIPE, TO CONFIRM NO BLOCKAGES.
  - DUCTILE IRON PIPE TO BE ENCASED IN POLYETHYLENE PLASTIC, ENTIRE LENGTH OF THE DUCTILE IRON SLEEVE.
  - CONTRACTOR TO INSURE 12" PIPE IS NOT IN CONTACT WITH DUCTILE IRON SLEEVE THROUGH INSTALLATION OF SPACERS.
  - SAND FILL ANNUAL SPACE BETWEEN 12" PIPE AND 20" SLEEVE.
  - INSTALL EXPANDING FOAM SEAL EACH END OF 20" SLEEVE TO FILL ANNUAL SPACE BETWEEN 12" PIPE AND 20" SLEEVE, FOAM TO EXTEND INTO THE 20" PIPE A MINIMUM OF 2 FT.



- GRANITE CURB AND SIDEWALK NOTES:**
- CONTRACTOR TO CAREFULLY REMOVE GRANITE CURB DURING EXCAVATION, STORE AND RE-INSTALL PER DETAIL ON DRAWING NO. 8. I
  - CONTRACTOR TO INSTALL NEW CONCRETE SIDEWALK WHERE DAMAGED OR REMOVED DURING PROJECT. SIDEWALK TO BE CONSTRUCTED AS DETAILED ON DRAWING NO. 8.
  - CONTRACTOR TO REPLACE BITUMINOUS SIDEWALK DISTURBED DURING CONSTRUCTION.
  1. REMAINING SIDEWALK TO BE CUT TO STRAIGHT PARALLEL LINES.
  2. EDGES OF SIDEWALK TO RECEIVE CONTINUOUS STRIP OF ASPHALTIC TACK COAT.
  - 3.3. A 4" DEPTH OF ASPHALTIC CONCRETE SIDEWALK MIX SHALL BE INSTALLED AND COMPACTED. FINISH GRADE TO MATCH EXISTING SIDEWALKS.

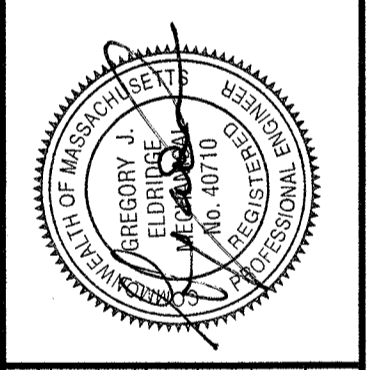
**CURB AND SIDEWALK REPLACEMENT**

TOWN OF NATICK, MASSACHUSETTS  
BOARD OF SELECTMEN

**WEST CENTRAL ST. & RT. 30  
WATER MAINS & HEALTH  
CENTER FORCEMAIN**

**HEALTH CENTER  
FORCEMAIN  
DETAILS**

**Haley and Ward, Inc.**  
63 GREAT ROAD, SUITE 200,  
MAYNARD, MASSACHUSETTS 01754-2097  
PHONE: (978) 648-6025 FAX: (978) 648-6068  
www.haleyward.com



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| REVISED | DATE | BY |
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|---------------|-----------------|
| SHEET NO.:    | 12 OF 21        |
| CONTRACT NO.: | W-148           |
| SCALE:        | AS NOTED        |
| DATE DRAWN:   | FEBRUARY 2018   |
| DRAWN BY:     | LJC             |
| FILE NO.:     | NAT-446_012.DWG |

**DWG. NO.**

**12**

1. MINIMUM LANE WIDTH OF 11 FEET SHALL BE MAINTAINED ALL THE TIME.
2. THE CONTRACTOR SHALL COORDINATE APPROVAL OF ANY CHANGES TO THE TEMPORARY TRAFFIC CONTROL PLAN WITH MASSACHUSETTS DEPARTMENT OF TRANSPORTATION (MASSDOT) PRIOR TO CONSTRUCTION ACTIVITIES. THE CONTRACTOR SHALL ALSO NOTIFY MASSDOT AND THE TOWN OF NATICK THREE (3) WEEKS IN ADVANCE OF PLACING TEMPORARY TRAFFIC CONTROL SIGNS.
3. THESE PLANS ARE NOT INTENDED TO LIMIT THE CONTRACTOR'S APPROACH TO SCHEDULE THE WORK BUT TO OUTLINE ONE WAY OF PROGRESSING. THE CONTRACTOR IS EXPECTED TO USE KNOWLEDGE AND EXPERIENCE TO PERFORM THE WORK IN THE MOST EFFICIENT AND SAFE MANNER IN COMPLIANCE WITH THE DRAWINGS AND SPECIFICATIONS.
4. PLACE ALL SAFETY DEVICES AND CONSTRUCTION SIGNING BEFORE ACTUAL CONSTRUCTION WORK BEGINS.
5. DISTANCES ARE A GUIDE AND MAY BE ADJUSTED BASED ON FIELD CONDITIONS WITH THE APPROVAL OF THE ENGINEER.
6. WHEN EXISTING SIGNS ARE NO LONGER APPLICABLE THEY SHALL BE TEMPORARILY COVERED DURING CONSTRUCTION OR REMOVED AND RESET UPON COMPLETION OF CONSTRUCTION. THE COST SHALL BE INCIDENTAL TO THE CONTRACT.
7. ALL SIGNS SHALL BE REFLECTORIZED, WITH REFLECTIVE SHEETING CONFORMING TO M9.30.0. ALL SIGN COLORS SHALL BE PER THE CONSTRUCTION SIGN SUMMARY TABLE AND CURRENT MUTCD.
8. SIGNS AND SIGN SUPPORTS LOCATED ON OR NEAR THE TRAVELED WAY MUST PASS THE CRITERIA SET FORTH IN THE NCHRP 350 REPORT.
9. CONTRACTOR SHALL RECORD EXISTING PAVEMENT MARKINGS AND RESTORE ALL MARKINGS TO EXISTING CONDITIONS AT THE CONCLUSION OF CONSTRUCTION AT EACH LOCATION.
10. ALL TRAFFIC CONTROL DEVICES SHALL BE REMOVED IMMEDIATELY WHEN NO LONGER NEEDED.
11. UNLESS OTHERWISE NOTED, ALL PAVEMENT MARKINGS, SIGNS AND OTHER TRAFFIC EQUIPMENT REMOVED OR DAMAGED AS A RESULT OF THE CONTRACTOR'S OPERATIONS SHALL BE REPLACED IN CONFORMANCE WITH THE CONTRACT DOCUMENTS.
12. CONTRACTOR SHALL INSTALL, RENEW, AND MAINTAIN ALL TRAFFIC CONTROL DEVICES AS SHOWN ON THE DRAWINGS IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
13. ACCESS/EGRESS TO ALL ABUTTERS SHALL BE MAINTAINED AT ALL TIMES DURING CONSTRUCTION.
14. THE CONTRACTOR SHALL MAINTAIN ADA COMPLIANT ACCESS AT ALL TIMES INCLUDING PEDESTRIAN GUIDANCE SYSTEMS. ALL PEDESTRIAN DETOURS OR BYPASSES SHALL BE ADA COMPLIANT WITH PROPER BARRICADES, RAILINGS, RAMPS, SIGNS, ETC.
15. CONTRACTOR SHALL MAINTAIN EMERGENCY PASSAGE AT ALL TIMES TO BUILDINGS WITHIN AND ADJACENT TO THE PROJECT LIMITS AS WELL AS A LARGER AREA IF AFFECTED BY CONSTRUCTION CONDITIONS. CONTRACTOR SHALL MAINTAIN 24 HOUR EMERGENCY VEHICLE ACCESS TO CONSTRUCTION AREAS.
16. CONTRACTOR SHALL COORDINATE WITH ABUTTERS FOR THE PROPOSED WORK AND SHALL NOTIFY EACH ABUTTER AT LEAST 24 HOURS IN ADVANCE OF THE START OF THE WORK THAT WILL REQUIRE TEMPORARY CLOSURE OF ACCESS TO THEIR PROPERTY.
17. THE CONTRACTOR SHALL COORDINATE THE WORK WITH ALL ABUTTING PROJECTS.

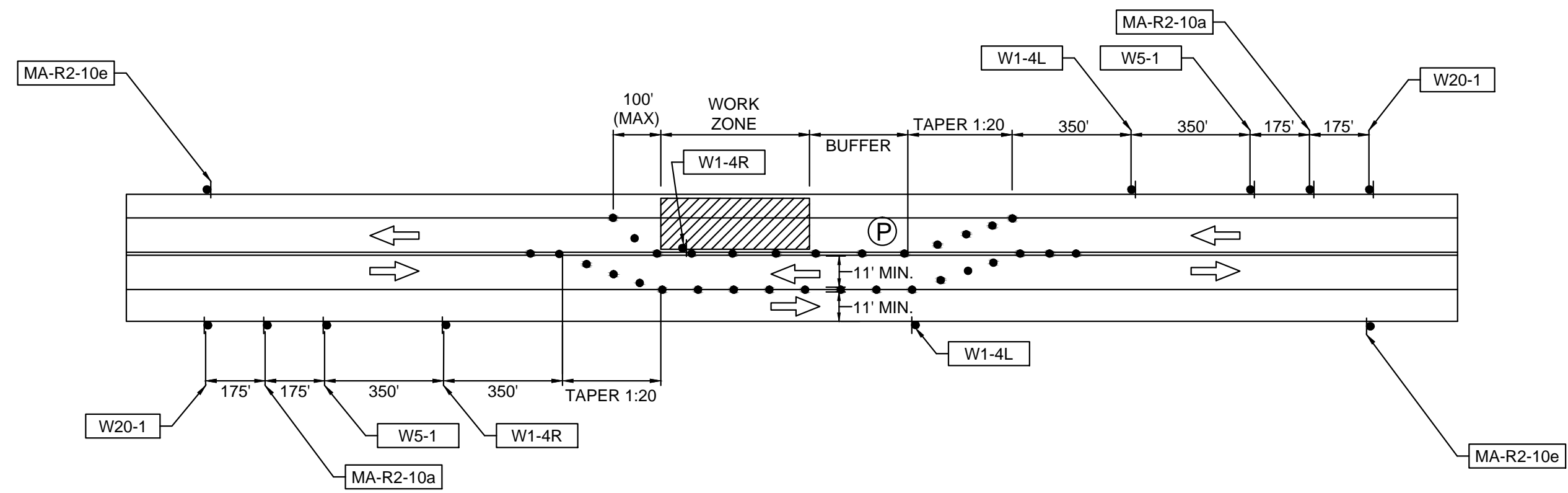


1. CURB RAMPS SHALL BE 60 IN. MINIMUM WIDTH WITH A FIRM, STABLE AND NON-SLIP SURFACE.
2. PROTECTIVE EDGING WITH A 2 IN. MINIMUM HEIGHT SHALL BE INSTALLED WHEN THE CURB RAMP OR LANDING PLATFORM HAS A VERTICAL DROP OF 6 IN. OR GREATER OR HAS A SIDE APRON SLOP STEEPER THAN 1:3 (33%). PROTECTIVE EDGING SHOULD BE CONSIDERED WHEN THE CURB RAMPS OR LANDING PLATFORMS HAVE A VERTICAL DROP OF 3 IN. OR MORE.
3. DETECTABLE EDGING WITH 6 IN. MINIMUM HEIGHT AND CONTRASTING COLOR SHALL BE INSTALLED ON ALL CURB RAMP LANDINGS WHERE THE WALKWAY CHANGES DIRECTION (TURNS).
4. CURB RAMPS AND LANDINGS SHOULD HAVE A 1:50 (2%) MAX CROSS-SLOPE.
5. CLEAR SPACE OF 48x48 IN. MINIMUM SHALL BE PROVIDED ABOVE AND BELOW THE CURB RAMP.
6. THE CURB RAMP WALKWAY EDGE SHALL BE MARKED WITH A CONTRASTING COLOR 2 TO 4 IN. WIDE MARKING. THE MARKING IS OPTIONAL WHERE COLOR CONTRASTING EDGING IS USED.
7. WATER FLOW IN THE GUTTER SYSTEM SHALL HAVE MINIMAL RESTRICTION.
8. LATERAL JOINTS OR GAPS BETWEEN SURFACES SHALL BE LESS THAN 0.5 IN. WIDTH.
9. CHANGES BETWEEN SURFACE HEIGHTS SHOULD NOT EXCEED 0.5 IN. LATERAL EDGES SHOULD BE VERTICAL UP TO 0.25 IN. HIGH, AND BEVELED AT 1:2 BETWEEN 0.25 IN. AND 0.5 IN. HEIGHT.

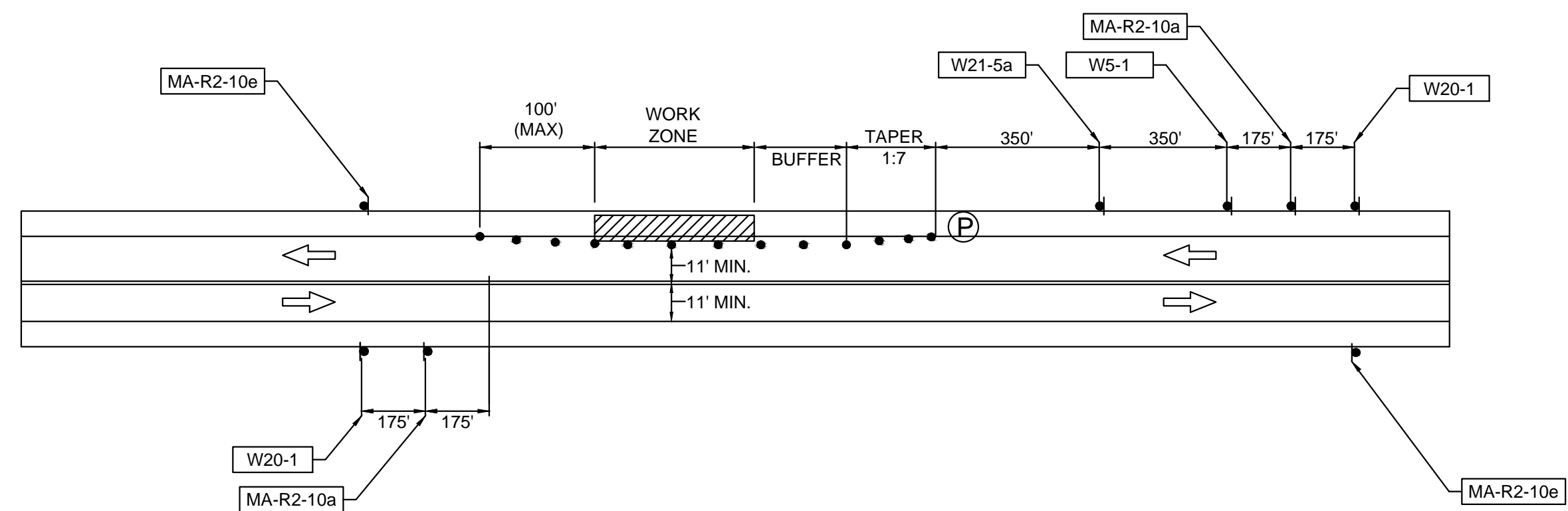


### TYPICAL APPLICATION - SIDEWALK WORK MIDBLOCK WITH TEMPORARY PEDESTRIAN PATH

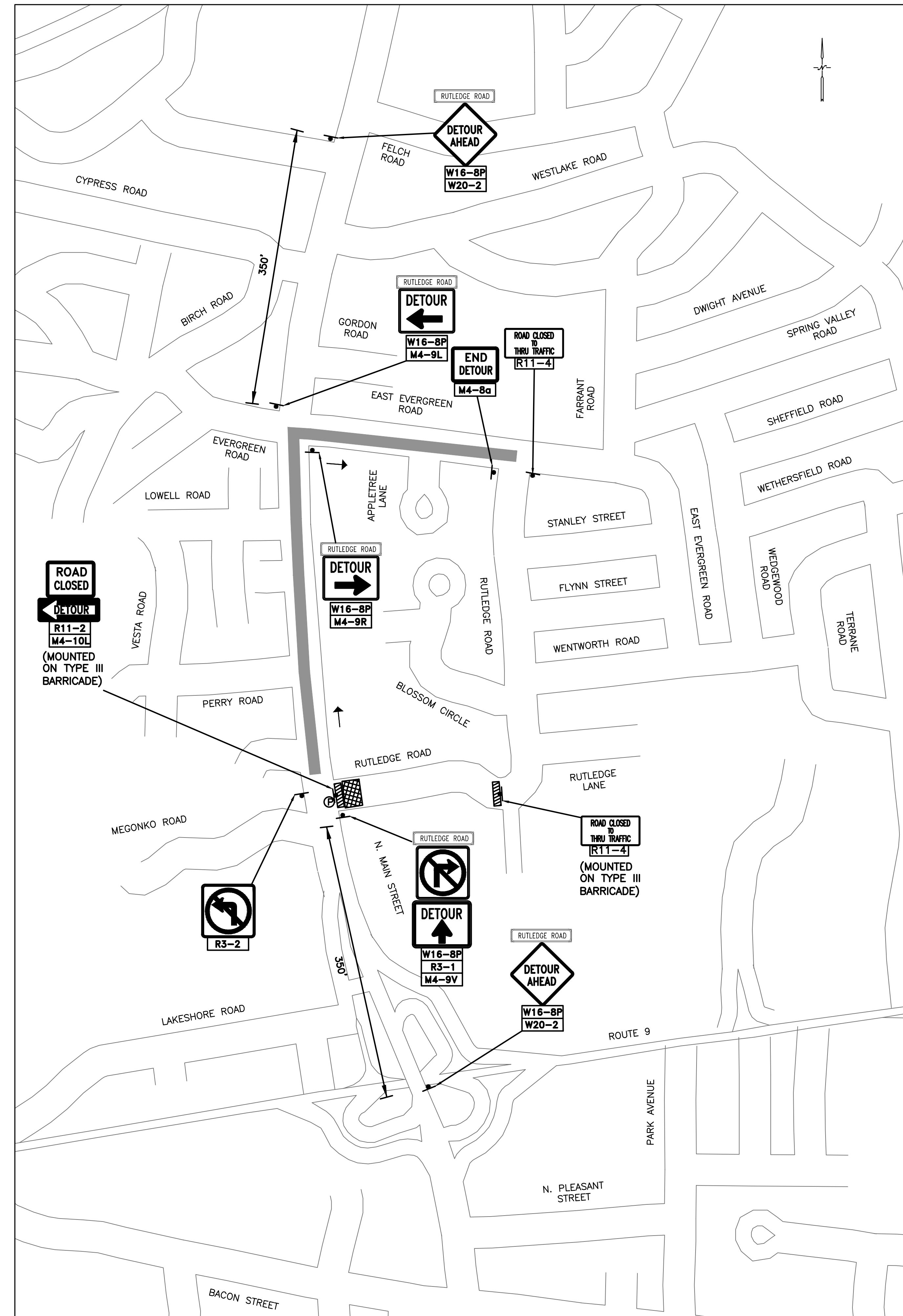
|   |                      |
|---|----------------------|
|  | DIRECTION OF TRAFFIC |
|  | SIGN                 |
|  | POLICE OFFICER       |
|  | REFLECTORIZED DRUM   |
|  | WORK ZONE            |
|  | TYPE III BARRICADE   |



TYPICAL APPLICATION - TWO LANE ROAD  
SHOULDER AND TRAVEL LANE CLOSURE  
NOT TO SCALE



TYPICAL APPLICATION - TWO LANE ROAD  
SHOULDER CLOSURE  
NOT TO SCALE





RUTLEDGE ROAD DETOUR  
PLAN

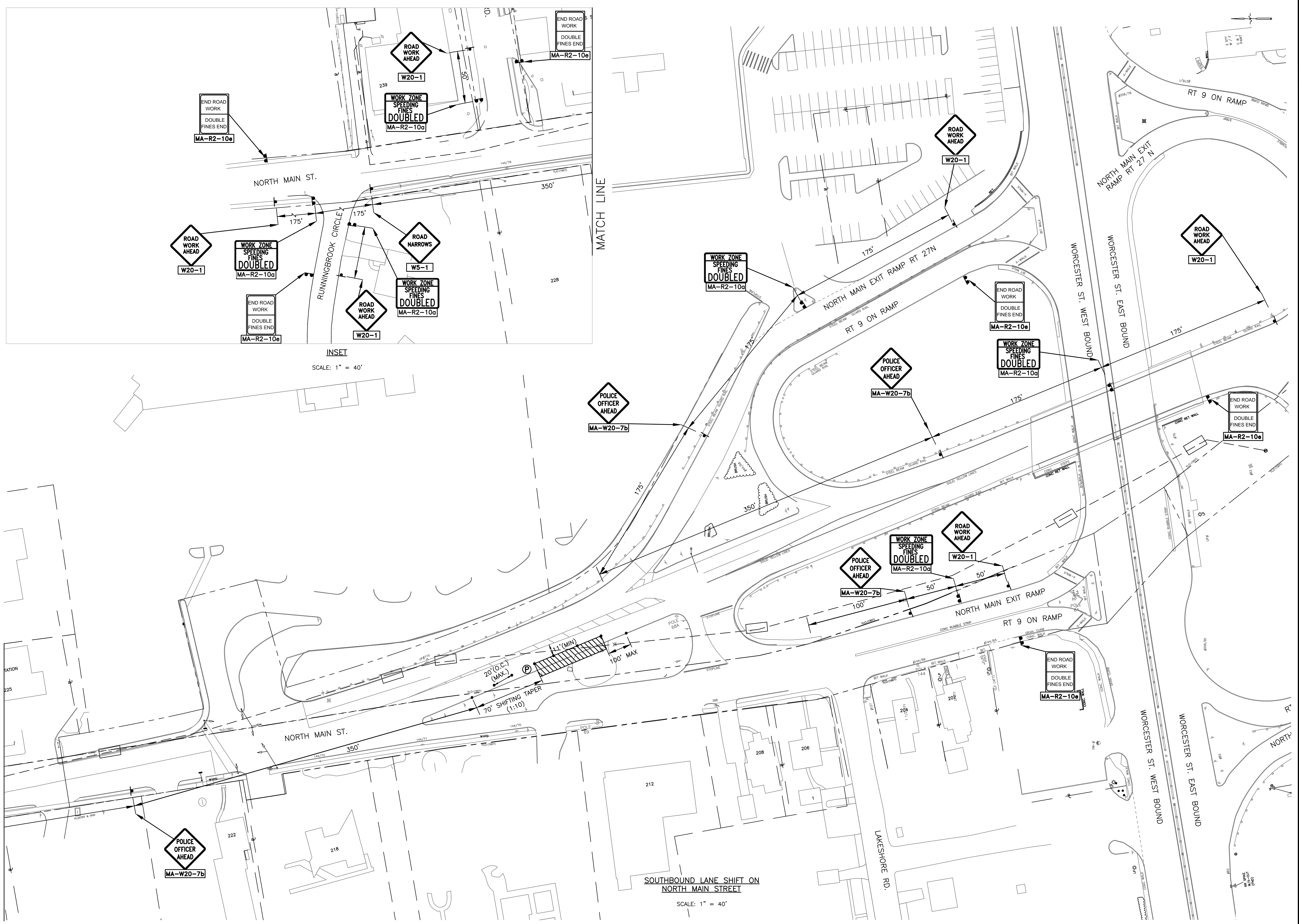
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LEGEND:

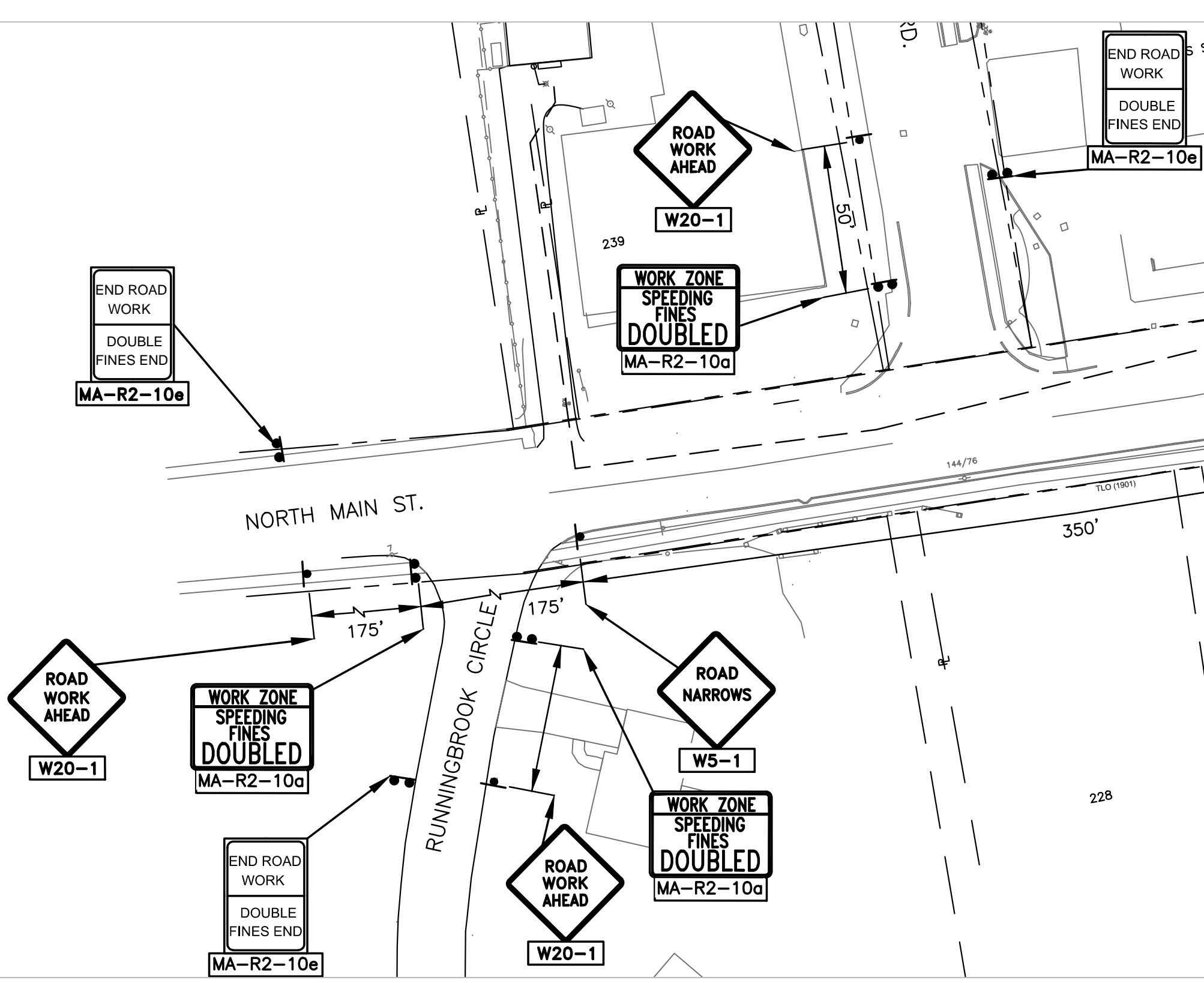
- DETOUR ROUTE
- ROAD CLOSURE

|   |  |  |  |   |  |
|---|--|--|--|---|--|
| DWG. NO.  |  | TOWN OF NATICK, MASSACHUSETTS<br>BOARD OF SELECTMEN  |  | WEST CENTRAL, RT<br>WATER MAINS AND HEALTH<br>CENTER FORCEMAIN                        |  |
| TEMPORARY TRAFFIC<br>MANAGEMENT<br>TYPICAL DETAILS 2                                  |  | GREEN INTERNATIONAL AFFILIATES, INC.<br>CIVIL & STRUCTURAL ENGINEERS<br>239 LITTLETON ROAD, SUITE 3<br>WESTFORD, MASSACHUSETTS |  |  |  |
|   |  |  |  |   |  |
|  |  |  |  |   |  |
| SHEET NO.: 14 OF 21   |  | CHECKED  |  | DATE  |  |
| CONTRACT NO.: W-148   |  | REVISED  |  | DATE  |  |
| SCALE: AS NOTED   |  |  |  | BY  |  |
| DATE DRAWN: MARCH 2018  |  |  |  |   |  |
| DRAWN BY: GB  |  |  |  |   |  |
| FILE NO.: NAT_451_TYPICAL DETAILS.DWG   |  |  |  |   |  |

MATCH LINE



INSET  
SCALE: 1" = 40'



TOWN OF NATICK, MASSACHUSETTS  
BOARD OF SELECTMEN

WEST CENTRAL, RT 30  
WATER MAINS AND HEALTH  
CENTER FORCEMAIN

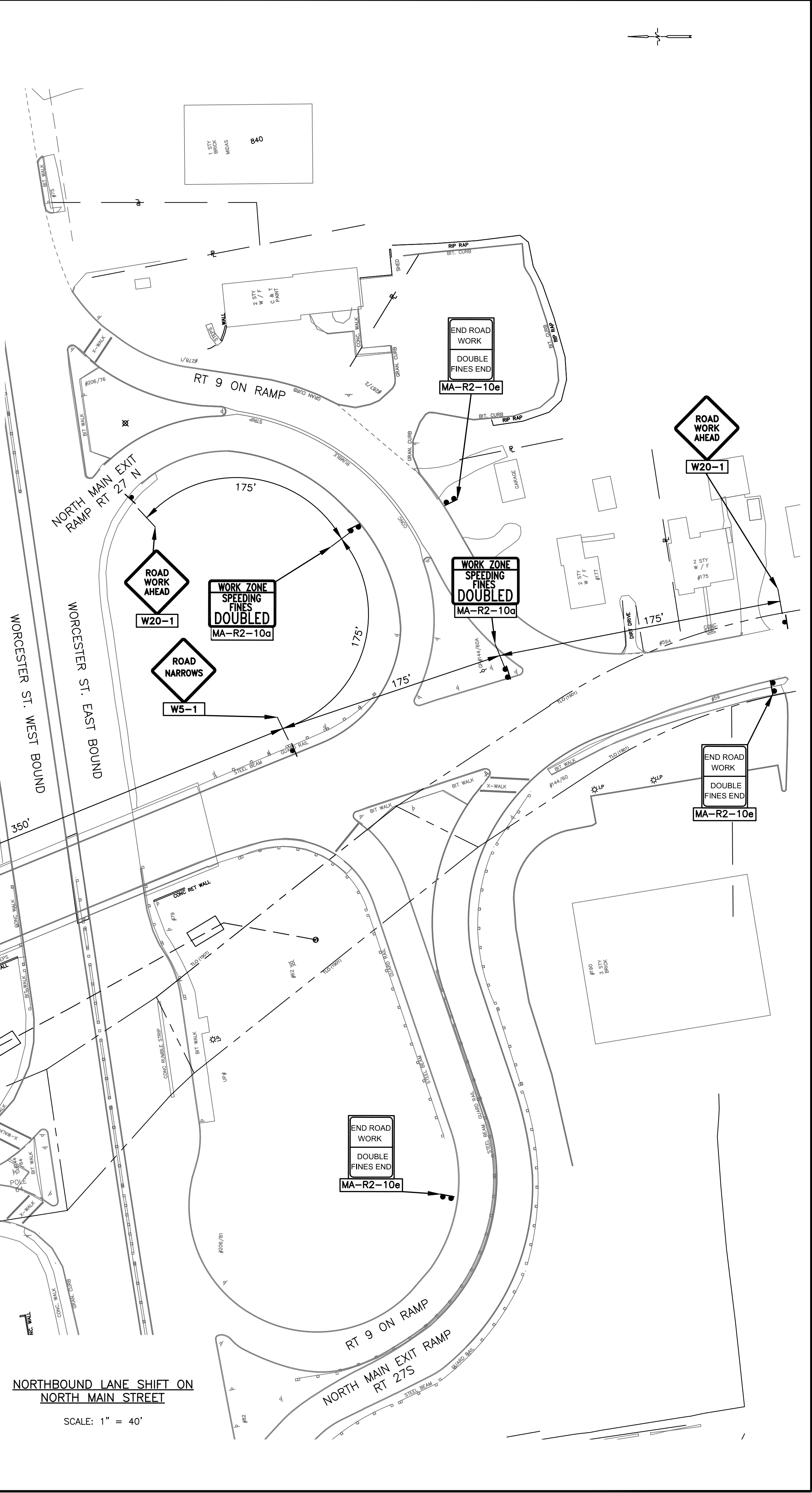
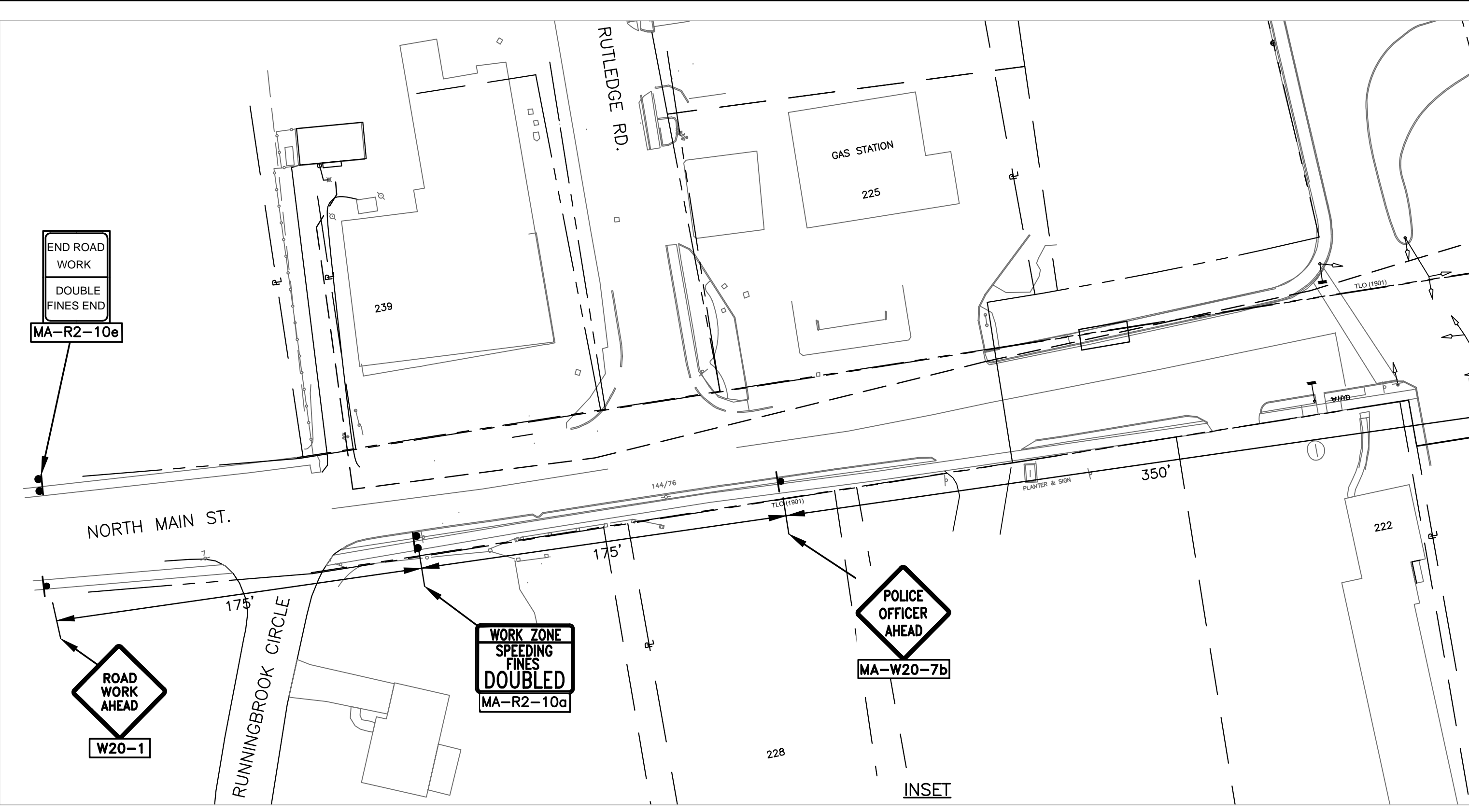
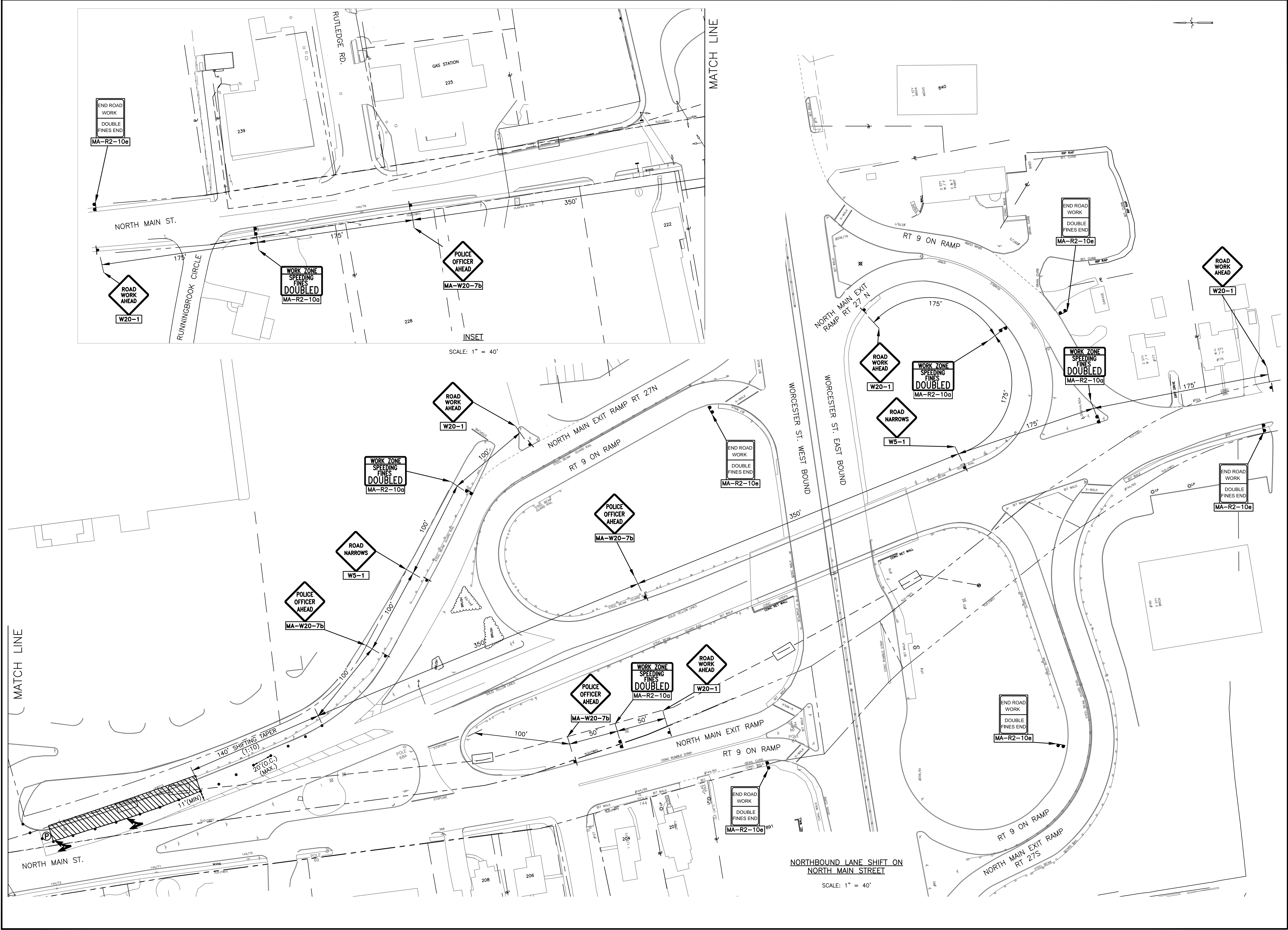
TEMPORARY TRAFFIC  
MANAGEMENT  
PLANS

GREEN INTERNATIONAL AFFILIATES, INC.  
CIVIL & STRUCTURAL ENGINEERS  
239 LITTLETON ROAD, SUITE 3  
WESTFORD, MASSACHUSETTS

|         |      |    |       |
|---------|------|----|-------|
| CHECKED | DATE | BY | JG/AW |
| REVIS   | DATE | BY |       |

SHEET NO.: 15 OF 21  
CONTRACT NO.: W-148  
SCALE: AS NOTED  
DATE DRAWN: MARCH 2018  
DRAWN BY: GB  
FILE NO.: NAT\_451\_TMP.DWG

DWG. NO.  
15



16 OF 21

CONTRACT NO.: W-148

SCALE: AS NOTED

DATE DRAWN: MARCH 2018

DRAWN BY: GB

FILE NO.: NAT\_451\_TMP.DWG

DATE

3/20/2018

BY

JG/AW

REVIS

DATE

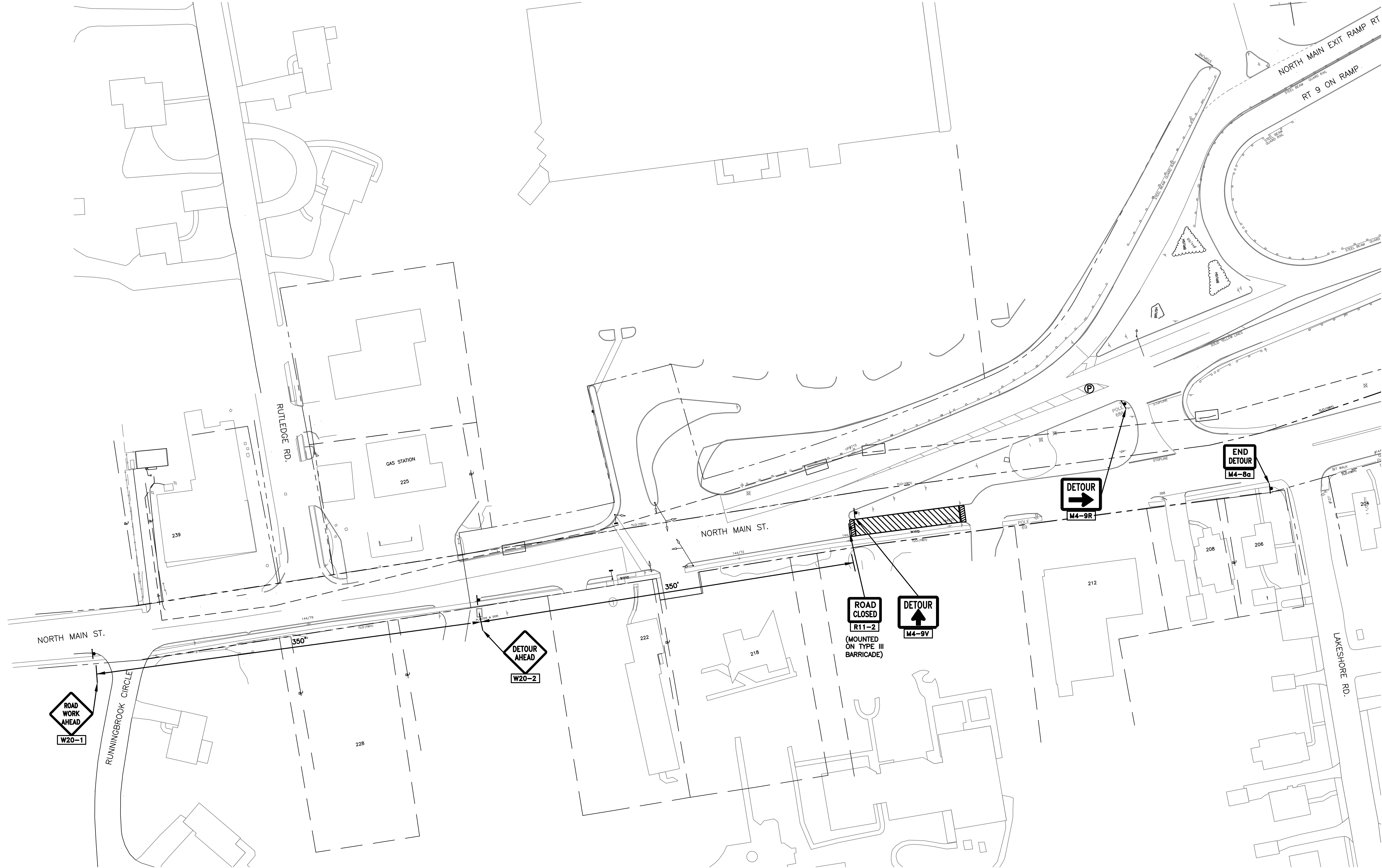
BY

DWG. NO.  
**16**

GREEN INTERNATIONAL AFFILIATES, INC.  
CIVIL & STRUCTURAL ENGINEERS  
239 LITTLETON ROAD, SUITE 3  
WESTFORD, MASSACHUSETTS

TEMPORARY TRAFFIC  
MANAGEMENT  
PLANS

TOWN OF NATICK, MASSACHUSETTS  
BOARD OF SELECTMEN  
**WEST CENTRAL, RT 30**  
**WATER MAINS AND HEALTH**  
**CENTER FORCEMAIN**



NORTH MAIN STREET DETOUR PLAN

SCALE: 1" = 40'

TOWN OF NATICK, MASSACHUSETTS  
BOARD OF SELECTMEN

WEST CENTRAL, RT 30  
WATER MAINS AND HEALTH  
CENTER FORCEMAIN

TEMPORARY TRAFFIC  
MANAGEMENT  
PLANS

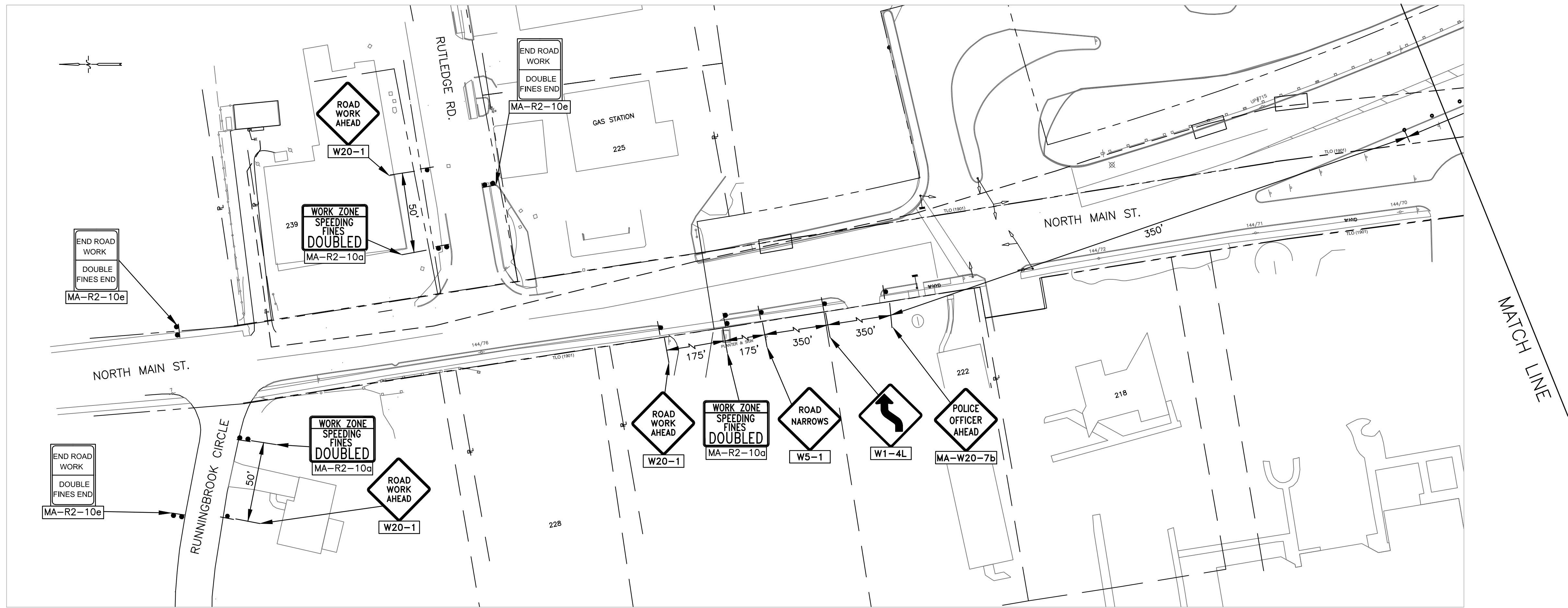
GREEN INTERNATIONAL AFFILIATES, INC.  
CIVIL & STRUCTURAL ENGINEERS  
239 LITTLETON ROAD, SUITE 3  
WESTFORD, MASSACHUSETTS

WILLIAM C. WONG  
NO. 84902  
STATE OF MASSACHUSETTS  
REGISTERED PROFESSIONAL ENGINEER  
8/2/18

| CHECKED | DATE      | BY    | DATE | BY |
|---------|-----------|-------|------|----|
|         | 3/20/2018 | JG/AW |      |    |
| REVISED |           |       | DATE | BY |
|         |           |       |      |    |
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|         |           |       |      |    |

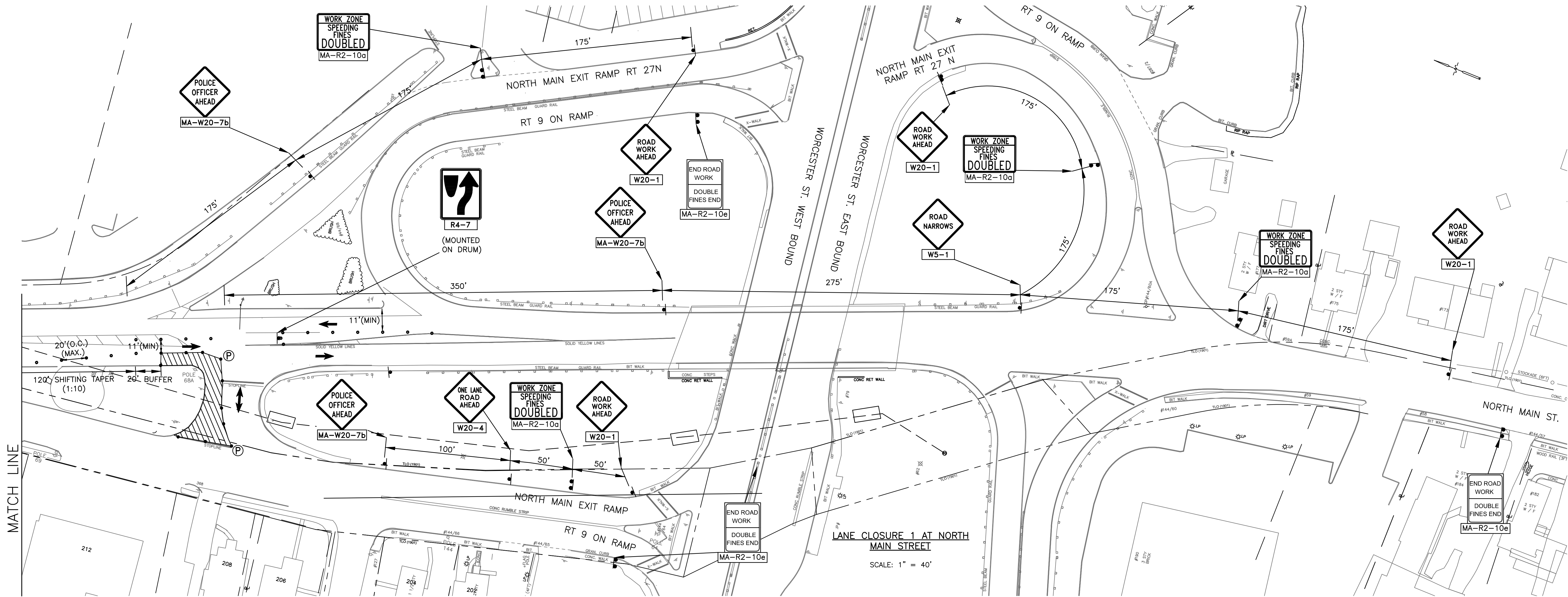
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| SHEET NO.:    | 17 OF 21        |
| CONTRACT NO.: | W-148           |
| SCALE:        | AS NOTED        |
| DATE DRAWN:   | MARCH 2018      |
| DRAWN BY:     | GB              |
| FILE NO.:     | NAT_451_TMP.DWG |

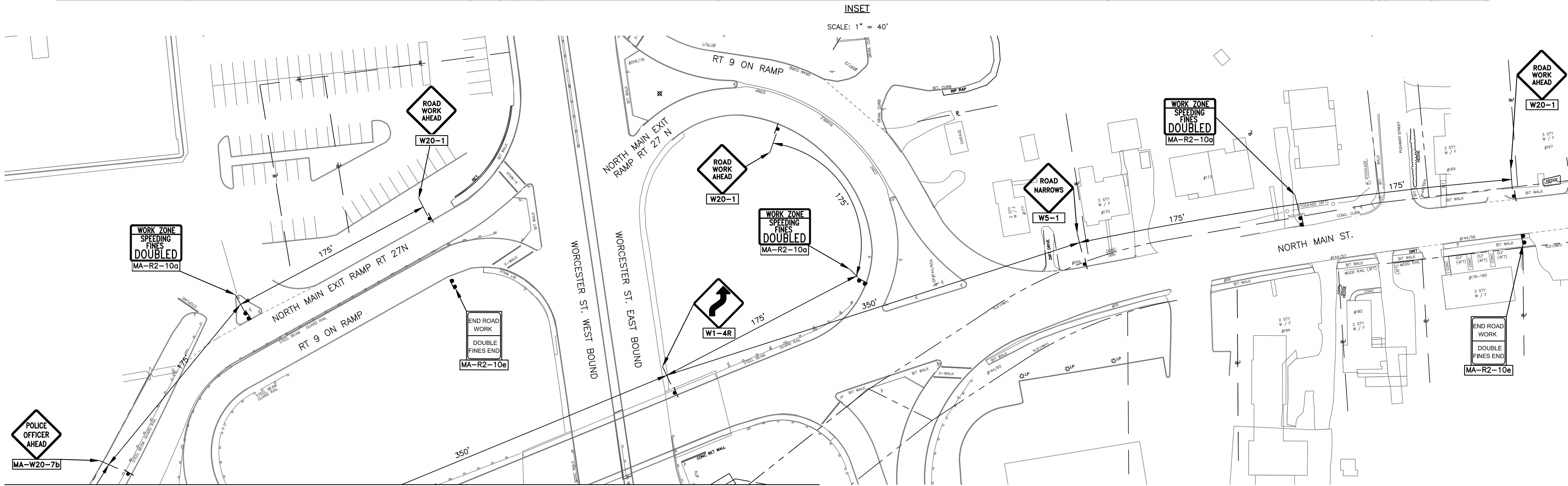
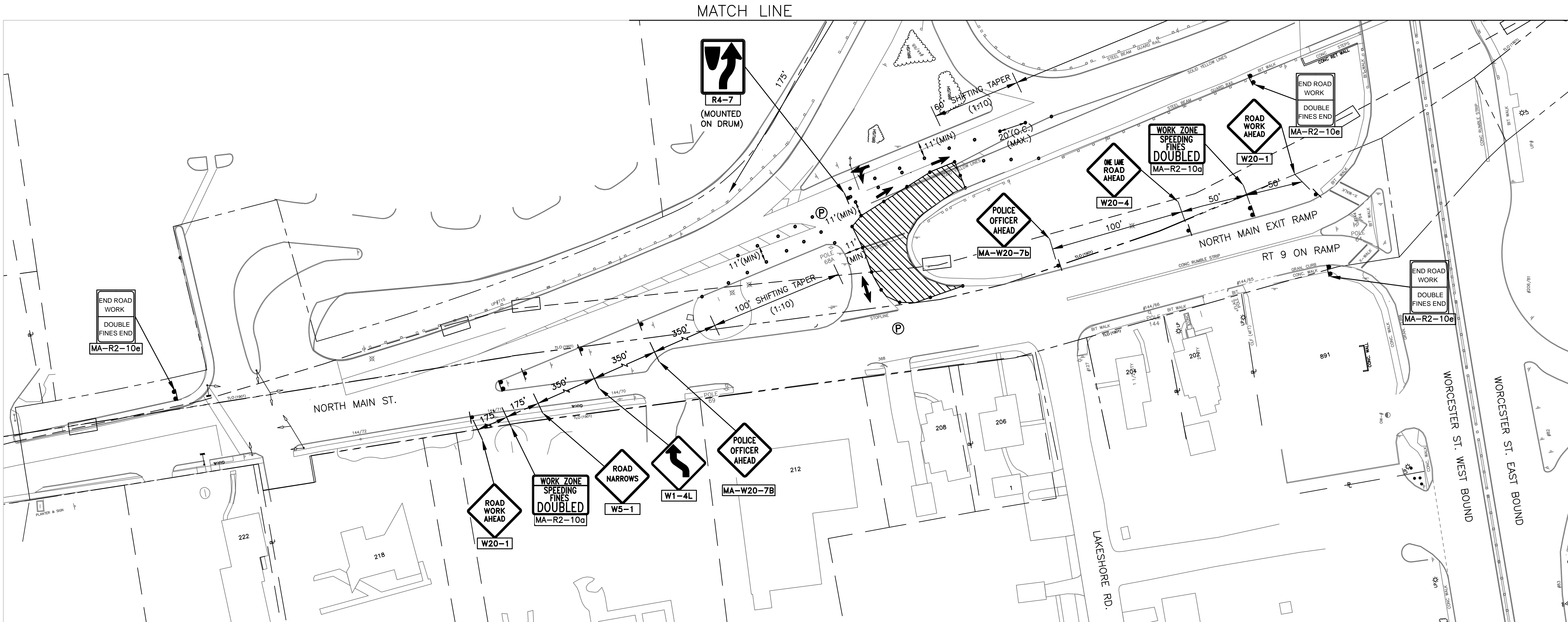
DWG. NO.  
  
17



INSET

SCALE: 1" = 40'





MATCH LINE

MATCH LINE

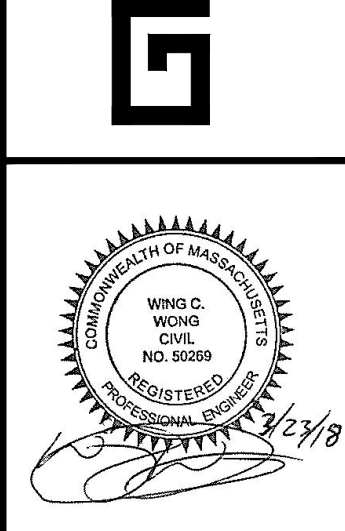
LANE CLOSURE 2 AT NORTH  
MAIN STREET

SCALE: 1" = 40'

TOWN OF NATICK, MASSACHUSETTS  
BOARD OF SELECTMEN  
**WEST CENTRAL, RT 30**  
**WATER MAINS AND HEALTH**  
**CENTER FORCEMAIN**

**TEMPORARY TRAFFIC**  
**MANAGEMENT**  
**PLANS**

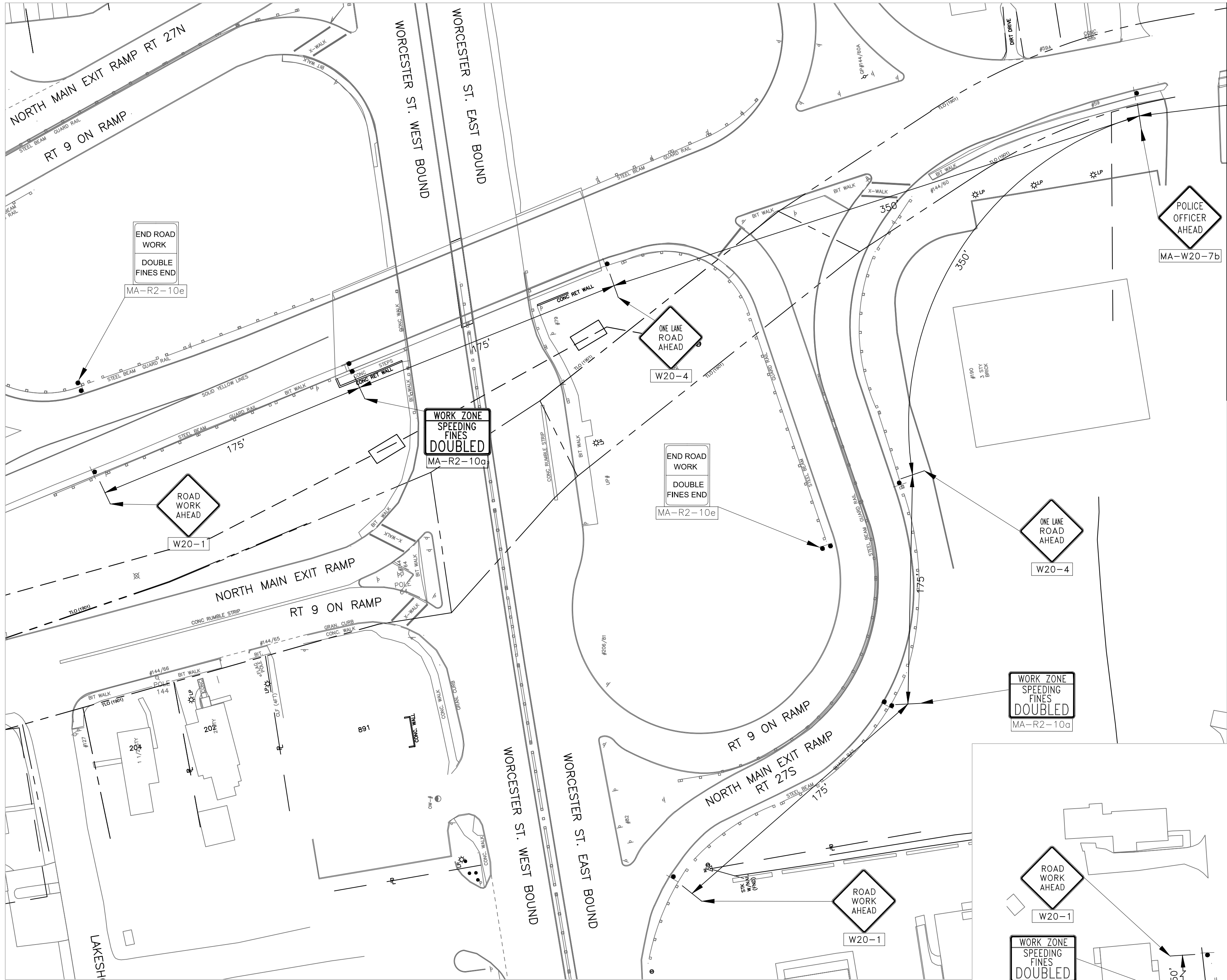
GREEN INTERNATIONAL AFFILIATES, INC.  
CIVIL & STRUCTURAL ENGINEERS  
239 LITTLETON ROAD, SUITE 3  
WESTFORD, MASSACHUSETTS



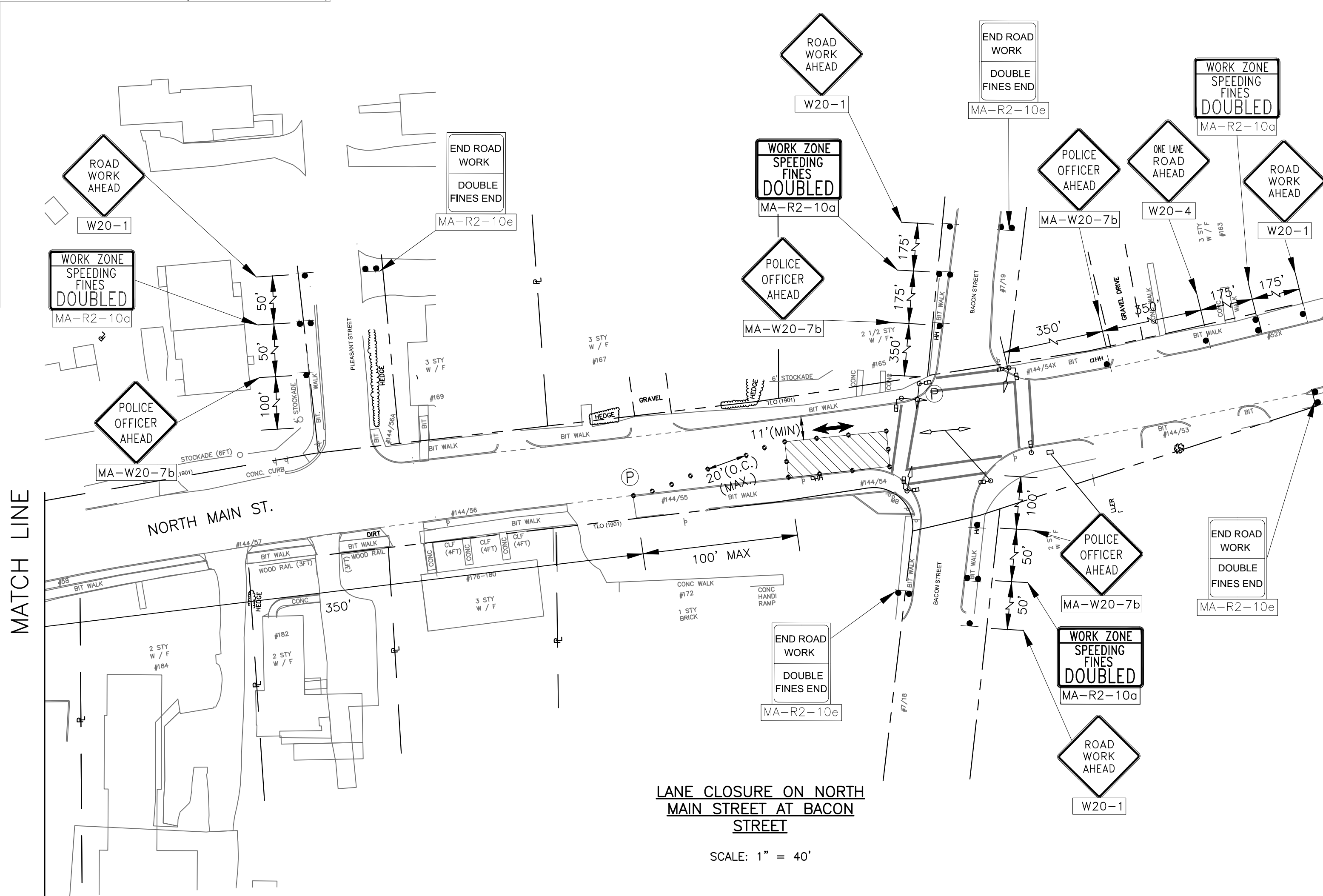
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|---------|-----------|-------|------|----|
|         | 3/20/2018 | JG/AW |      |    |
| REVIS   | DATE      | BY    | DATE | BY |
|         |           |       |      |    |
|         |           |       |      |    |

|               |                 |
|---------------|-----------------|
| SHEET NO.:    | 19 OF 21        |
| CONTRACT NO.: | W-148           |
| SCALE:        | AS NOTED        |
| DATE DRAWN:   | MARCH 2018      |
| DRAWN BY:     | GB              |
| FILE NO.:     | NAT_451_TMP.DWG |

DWG. NO.  
**19**



INSET  
SCALE: 1" = 40'



TOWN OF NATICK, MASSACHUSETTS  
BOARD OF SELECTMEN

WEST CENTRAL, RT 30  
WATER MAINS AND HEALTH  
CENTER FORCEMAIN

TEMPORARY TRAFFIC  
MANAGEMENT  
PLANS

GREEN INTERNATIONAL AFFILIATES, INC.  
CIVIL & STRUCTURAL ENGINEERS  
239 LITTLETON ROAD, SUITE 3  
WESTFORD, MASSACHUSETTS

|         |           |       |      |    |
|---------|-----------|-------|------|----|
| CHECKED | DATE      | BY    | DATE | BY |
|         | 3/20/2018 | JG/JW |      |    |
| REVIS   | DATE      | BY    | DATE | BY |
|         |           |       |      |    |
|         |           |       |      |    |

SHEET NO.: 20 OF 21

CONTRACT NO.: W-148

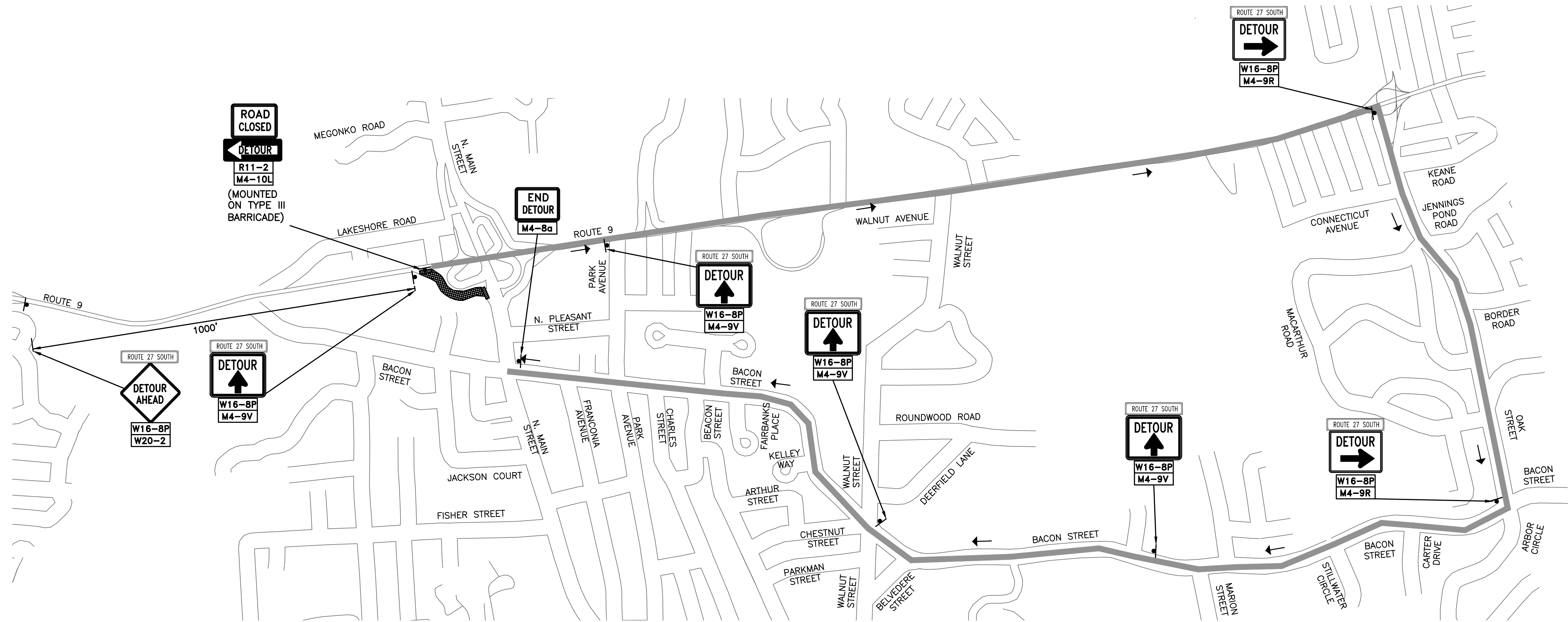
SCALE: AS NOTED

DATE DRAWN: MARCH 2018

DRAWN BY: CB

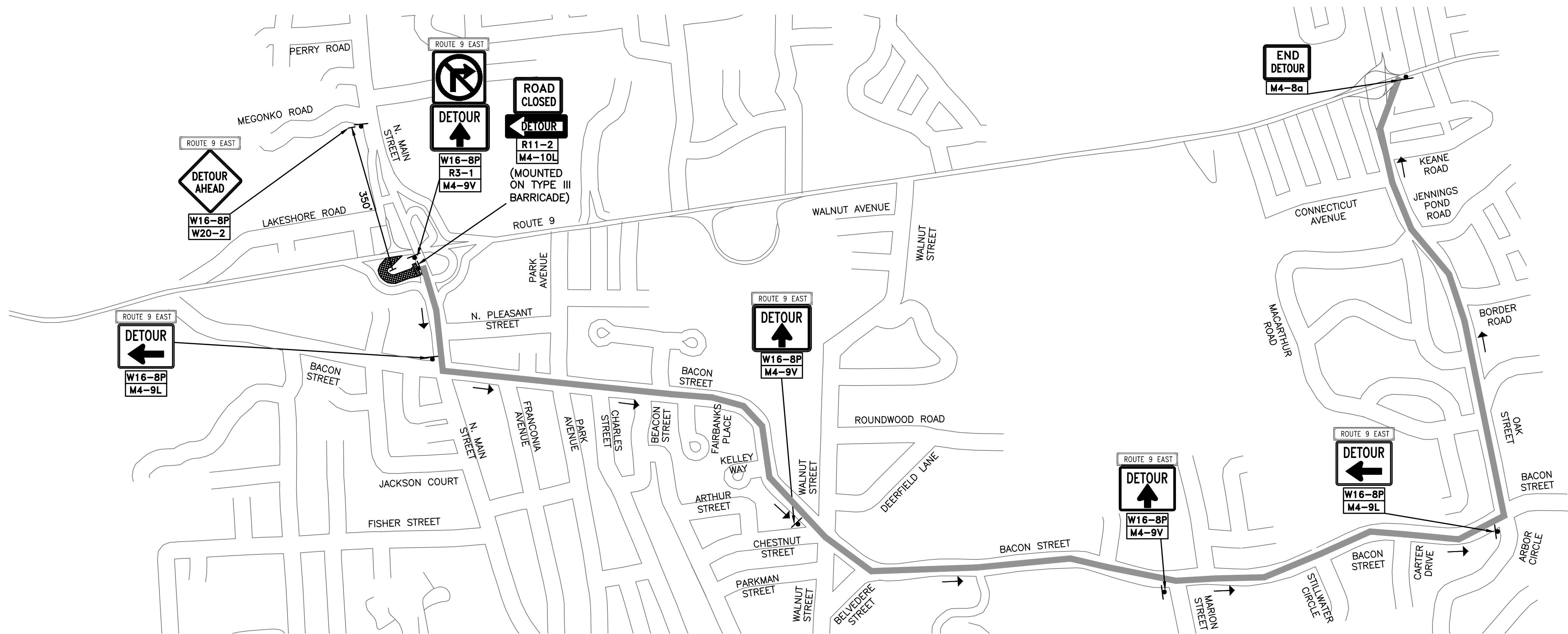
FILE NO.: NAT\_451\_TMP.DWG

DWG. NO.  
  
20



ROUTE 9 OFF RAMP DETOUR

SCALE: 1" = 150'



ROUTE 9 ON RAMP DETOUR

SCALE: 1" = 150'

NOTE:  
WORK ON THIS SHEET SHALL  
BE DONE DURING NIGHT  
HOURS.

LEGEND:  
DETOUR ROUTE  
ROAD CLOSURE

TOWN OF NATICK, MASSACHUSETTS  
BOARD OF SELECTMEN

WEST CENTRAL, RT 30  
WATER MAINS AND HEALTH  
CENTER FORCEMAIN

TEMPORARY TRAFFIC  
MANAGEMENT  
PLANS

GREEN INTERNATIONAL AFFILIATES, INC.  
CIVIL & STRUCTURAL ENGINEERS  
239 LITTLETON ROAD, SUITE 3  
WESTFORD, MASSACHUSETTS

|         |           |       |         |      |    |
|---------|-----------|-------|---------|------|----|
| CHECKED | DATE      | BY    | CHECKED | DATE | BY |
|         | 3/20/2018 | JG/AW |         |      |    |
| REVISD  | DATE      | BY    |         |      |    |
|         |           |       |         |      |    |

SHEET NO.: 21 OF 21  
CONTRACT NO.: W-148  
SCALE: AS NOTED  
DATE DRAWN: MARCH 2018  
DRAWN BY: GB  
FILE NO.: NAT\_451\_DETOURS.DWG

DWG. NO.  
21