

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
DEMO: BACKHOE/LOADER/HAMMER OPERATOR <i>LABORERS - ZONE 2</i>	12/01/2018	\$39.80	\$7.85	\$15.35	\$0.00	\$63.00
	06/01/2019	\$40.80	\$7.85	\$15.35	\$0.00	\$64.00
	12/01/2019	\$41.80	\$7.85	\$15.35	\$0.00	\$65.00
For apprentice rates see "Apprentice- LABORER"						
DEMO: BURNERS <i>LABORERS - ZONE 2</i>	12/01/2018	\$39.55	\$7.85	\$15.35	\$0.00	\$62.75
	06/01/2019	\$40.55	\$7.85	\$15.35	\$0.00	\$63.75
	12/01/2019	\$41.55	\$7.85	\$15.35	\$0.00	\$64.75
For apprentice rates see "Apprentice- LABORER"						
DEMO: CONCRETE CUTTER/SAWYER <i>LABORERS - ZONE 2</i>	12/01/2018	\$39.80	\$7.85	\$15.35	\$0.00	\$63.00
	06/01/2019	\$40.80	\$7.85	\$15.35	\$0.00	\$64.00
	12/01/2019	\$41.80	\$7.85	\$15.35	\$0.00	\$65.00
For apprentice rates see "Apprentice- LABORER"						
DEMO: JACKHAMMER OPERATOR <i>LABORERS - ZONE 2</i>	12/01/2018	\$39.55	\$7.85	\$15.35	\$0.00	\$62.75
	06/01/2019	\$40.55	\$7.85	\$15.35	\$0.00	\$63.75
	12/01/2019	\$41.55	\$7.85	\$15.35	\$0.00	\$64.75
For apprentice rates see "Apprentice- LABORER"						
DEMO: WRECKING LABORER <i>LABORERS - ZONE 2</i>	12/01/2018	\$38.80	\$7.85	\$15.35	\$0.00	\$62.00
	06/01/2019	\$39.80	\$7.85	\$15.35	\$0.00	\$63.00
	12/01/2019	\$40.80	\$7.85	\$15.35	\$0.00	\$64.00
For apprentice rates see "Apprentice- LABORER"						
DIRECTIONAL DRILL MACHINE OPERATOR <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2018	\$47.10	\$11.50	\$15.60	\$0.00	\$74.20
	06/01/2019	\$48.19	\$11.50	\$15.60	\$0.00	\$75.29
	12/01/2019	\$49.33	\$11.50	\$15.60	\$0.00	\$76.43
	06/01/2020	\$50.41	\$11.50	\$15.60	\$0.00	\$77.51
	12/01/2020	\$51.55	\$11.50	\$15.60	\$0.00	\$78.65
	06/01/2021	\$52.64	\$11.50	\$15.60	\$0.00	\$79.74
	12/01/2021	\$53.78	\$11.50	\$15.60	\$0.00	\$80.88
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
DIVER <i>PILE DRIVER LOCAL 56 (ZONE 1)</i>	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 <i>PILE DRIVER LOCAL 56 (ZONE 1)</i>	08/01/2018	\$46.57	\$9.90	\$21.15	\$0.00	\$77.62
	08/01/2019	\$48.94	\$9.90	\$21.15	\$0.00	\$79.99
For apprentice rates see "Apprentice- PILE DRIVER"						
DIVER TENDER (EFFLUENT) <i>PILE DRIVER LOCAL 56 (ZONE 1)</i>	08/01/2018	\$69.86	\$9.90	\$21.15	\$0.00	\$100.91
	08/01/2019	\$73.41	\$9.90	\$21.15	\$0.00	\$104.46
For apprentice rates see "Apprentice- PILE DRIVER"						
DIVER/SLURRY (EFFLUENT) <i>PILE DRIVER LOCAL 56 (ZONE 1)</i>	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"						
DRAWBRIDGE OPERATOR (Construction) <i>ELECTRICIANS LOCAL 103</i>	03/01/2019	\$51.10	\$13.00	\$18.88	\$0.00	\$82.98
For apprentice rates see "Apprentice- ELECTRICIAN"						
ELECTRICIAN <i>ELECTRICIANS LOCAL 103</i>	03/01/2019	\$51.10	\$13.00	\$18.88	\$0.00	\$82.98

## Classification

Effective Date    Base Wage    Health    Pension    Supplemental  
Unemployment    Total RateApprentice - *ELECTRICIAN - Local 103*

Effective Date - 03/01/2019

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	\$20.44	\$13.00	\$0.61	\$0.00	\$34.05
2	40	\$20.44	\$13.00	\$0.61	\$0.00	\$34.05
3	45	\$23.00	\$13.00	\$14.34	\$0.00	\$50.34
4	45	\$23.00	\$13.00	\$14.34	\$0.00	\$50.34
5	50	\$25.55	\$13.00	\$14.76	\$0.00	\$53.31
6	55	\$28.11	\$13.00	\$15.17	\$0.00	\$56.28
7	60	\$30.66	\$13.00	\$15.58	\$0.00	\$59.24
8	65	\$33.22	\$13.00	\$16.00	\$0.00	\$62.22
9	70	\$35.77	\$13.00	\$16.40	\$0.00	\$65.17
10	75	\$38.33	\$13.00	\$16.82	\$0.00	\$68.15

## Notes :

App Prior 1/1/03; 30/35/40/45/50/55/65/70/75/80

Apprentice to Journeyworker Ratio:2:3\*\*\*

ELEVATOR CONSTRUCTOR  
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

Apprentice - *ELEVATOR CONSTRUCTOR - Local 4*

Effective Date - 01/01/2019

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental 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

Effective Date - 01/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$30.71	\$15.73	\$0.00	\$0.00	\$46.44
2	55	\$33.78	\$15.73	\$18.41	\$0.00	\$67.92
3	65	\$39.92	\$15.73	\$18.41	\$0.00	\$74.06
4	70	\$42.99	\$15.73	\$18.41	\$0.00	\$77.13
5	80	\$49.14	\$15.73	\$18.41	\$0.00	\$83.28

## Notes:

Steps 1-2 are 6 mos.; Steps 3-5 are 1 year

Apprentice to Journeyworker Ratio:1:1

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
ELEVATOR CONSTRUCTOR HELPER <i>ELEVATOR CONSTRUCTORS LOCAL 4</i>	01/01/2019	\$41.63	\$15.58	\$17.51	\$0.00	\$74.72
	01/01/2020	\$42.99	\$15.73	\$18.41	\$0.00	\$77.13
	01/01/2021	\$44.43	\$15.88	\$19.31	\$0.00	\$79.62
	01/01/2022	\$45.93	\$16.03	\$20.21	\$0.00	\$82.17
For apprentice rates see "Apprentice - ELEVATOR CONSTRUCTOR"						
FENCE & GUARD RAIL ERECTOR <i>LABORERS - ZONE 2</i>	12/01/2018	\$33.77	\$7.85	\$14.44	\$0.00	\$56.06
	06/01/2019	\$34.64	\$7.85	\$14.44	\$0.00	\$56.93
	12/01/2019	\$35.50	\$7.85	\$14.44	\$0.00	\$57.79
	06/01/2020	\$36.39	\$7.85	\$14.44	\$0.00	\$58.68
	12/01/2020	\$37.28	\$7.85	\$14.44	\$0.00	\$59.57
	06/01/2021	\$38.20	\$7.85	\$14.44	\$0.00	\$60.49
	12/01/2021	\$39.11	\$7.85	\$14.44	\$0.00	\$61.40
For apprentice rates see "Apprentice- LABORER"						
FIELD ENG.INST.PERSON-BLDG,SITE,HVY/HWY <i>OPERATING ENGINEERS LOCAL 4</i>	11/01/2018	\$43.19	\$11.00	\$15.50	\$0.00	\$69.69
	05/01/2019	\$44.33	\$11.00	\$15.50	\$0.00	\$70.83
	11/01/2019	\$45.33	\$11.00	\$15.50	\$0.00	\$71.83
	05/01/2020	\$46.48	\$11.00	\$15.50	\$0.00	\$72.98
	11/01/2020	\$47.48	\$11.00	\$15.50	\$0.00	\$73.98
	05/01/2021	\$48.68	\$11.00	\$15.50	\$0.00	\$75.18
	11/01/2021	\$49.63	\$11.00	\$15.50	\$0.00	\$76.13
	05/01/2022	\$50.78	\$11.00	\$15.50	\$0.00	\$77.28
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
FIELD ENG.PARTY CHIEF-BLDG,SITE,HVY/HWY <i>OPERATING ENGINEERS LOCAL 4</i>	11/01/2018	\$44.67	\$11.00	\$15.50	\$0.00	\$71.17
	05/01/2019	\$45.82	\$11.00	\$15.50	\$0.00	\$72.32
	11/01/2019	\$46.83	\$11.00	\$15.50	\$0.00	\$73.33
	05/01/2020	\$47.98	\$11.00	\$15.50	\$0.00	\$74.48
	11/01/2020	\$48.99	\$11.00	\$15.50	\$0.00	\$75.49
	05/01/2021	\$50.15	\$11.00	\$15.50	\$0.00	\$76.65
	11/01/2021	\$51.16	\$11.00	\$15.50	\$0.00	\$77.66
	05/01/2022	\$52.32	\$11.00	\$15.50	\$0.00	\$78.82
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
FIELD ENG.ROD PERSON-BLDG,SITE,HVY/HWY <i>OPERATING ENGINEERS LOCAL 4</i>	11/01/2018	\$22.45	\$11.00	\$15.50	\$0.00	\$48.95
	05/01/2019	\$23.13	\$11.00	\$15.50	\$0.00	\$49.63
	11/01/2019	\$23.72	\$11.00	\$15.50	\$0.00	\$50.22
	05/01/2020	\$24.39	\$11.00	\$15.50	\$0.00	\$50.89
	11/01/2020	\$24.98	\$11.00	\$15.50	\$0.00	\$51.48
	05/01/2021	\$25.66	\$11.00	\$15.50	\$0.00	\$52.16
	11/01/2021	\$26.26	\$11.00	\$15.50	\$0.00	\$52.76
	05/01/2022	\$26.93	\$11.00	\$15.50	\$0.00	\$53.43
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
FIRE ALARM INSTALLER <i>ELECTRICIANS LOCAL 103</i>	03/01/2019	\$51.10	\$13.00	\$18.88	\$0.00	\$82.98
For apprentice rates see "Apprentice- ELECTRICIAN"						
FIRE ALARM REPAIR / MAINTENANCE / COMMISSIONING <i>ELECTRICIANS LOCAL 103</i>	03/01/2019	\$38.33	\$13.00	\$16.82	\$0.00	\$68.15
For apprentice rates see "Apprentice- TELECOMMUNICATIONS TECHNICIAN"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
<b>FIREMAN (ASST. ENGINEER)</b> <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2018	\$39.13	\$11.50	\$15.60	\$0.00	\$66.23
	06/01/2019	\$40.04	\$11.50	\$15.60	\$0.00	\$67.14
	12/01/2019	\$40.99	\$11.50	\$15.60	\$0.00	\$68.09
	06/01/2020	\$41.90	\$11.50	\$15.60	\$0.00	\$69.00
	12/01/2020	\$42.85	\$11.50	\$15.60	\$0.00	\$69.95
	06/01/2021	\$43.76	\$11.50	\$15.60	\$0.00	\$70.86
	12/01/2021	\$44.71	\$11.50	\$15.60	\$0.00	\$71.81
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
<b>FLAGGER &amp; SIGNALER</b> <i>LABORERS - ZONE 2</i>	12/01/2018	\$22.50	\$7.85	\$14.44	\$0.00	\$44.79
	06/01/2019	\$22.50	\$7.85	\$14.44	\$0.00	\$44.79
	12/01/2019	\$23.50	\$7.85	\$14.44	\$0.00	\$45.79
	06/01/2020	\$23.50	\$7.85	\$14.44	\$0.00	\$45.79
	12/01/2020	\$24.50	\$7.85	\$14.44	\$0.00	\$46.79
	06/01/2021	\$24.50	\$7.85	\$14.44	\$0.00	\$46.79
	12/01/2021	\$24.50	\$7.85	\$14.44	\$0.00	\$46.79
For apprentice rates see "Apprentice- LABORER"						
<b>FLOORCOVERER</b> <i>FLOORCOVERERS LOCAL 2168 ZONE 1</i>	03/01/2016	\$42.13	\$9.80	\$17.62	\$0.00	\$69.55

**Apprentice - FLOORCOVERER - Local 2168 Zone 1**

**Effective Date - 03/01/2016**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total 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.

% After 09/1/17; 45/45/55/55/70/70/80/80 (1500hr Steps)

Step 1&2 \$30.55/ 3&4 \$36.49/ 5&6 \$53.33/ 7&8 \$59.33

**Apprentice to Journeyworker Ratio:1:1**

<b>FORK LIFT/CHERRY PICKER</b> <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2018	\$47.58	\$11.50	\$15.60	\$0.00	\$74.68
	06/01/2019	\$48.68	\$11.50	\$15.60	\$0.00	\$75.78
	12/01/2019	\$49.83	\$11.50	\$15.60	\$0.00	\$76.93
	06/01/2020	\$50.93	\$11.50	\$15.60	\$0.00	\$78.03
	12/01/2020	\$52.08	\$11.50	\$15.60	\$0.00	\$79.18
	06/01/2021	\$53.18	\$11.50	\$15.60	\$0.00	\$80.28
	12/01/2021	\$54.33	\$11.50	\$15.60	\$0.00	\$81.43

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
GENERATOR/LIGHTING PLANT/HEATERS <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2018	\$32.03	\$11.50	\$15.60	\$0.00	\$59.13
	06/01/2019	\$32.78	\$11.50	\$15.60	\$0.00	\$59.88
	12/01/2019	\$33.57	\$11.50	\$15.60	\$0.00	\$60.67
	06/01/2020	\$34.32	\$11.50	\$15.60	\$0.00	\$61.42
	12/01/2020	\$35.10	\$11.50	\$15.60	\$0.00	\$62.20
	06/01/2021	\$35.85	\$11.50	\$15.60	\$0.00	\$62.95
	12/01/2021	\$36.64	\$11.50	\$15.60	\$0.00	\$63.74
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
GLAZIER (GLASS PLANK/AIR BARRIER/INTERIOR SYSTEMS) <i>GLAZIERS LOCAL 35 (ZONE 2)</i>	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 - 01/01/2019**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$19.93	\$8.15	\$0.00	\$0.00	\$28.08
2	55	\$21.92	\$8.15	\$5.64	\$0.00	\$35.71
3	60	\$23.92	\$8.15	\$6.15	\$0.00	\$38.22
4	65	\$25.91	\$8.15	\$6.66	\$0.00	\$40.72
5	70	\$27.90	\$8.15	\$17.78	\$0.00	\$53.83
6	75	\$29.90	\$8.15	\$18.29	\$0.00	\$56.34
7	80	\$31.89	\$8.15	\$18.80	\$0.00	\$58.84
8	90	\$35.87	\$8.15	\$19.83	\$0.00	\$63.85

**Effective Date - 07/01/2019**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$20.48	\$8.15	\$0.00	\$0.00	\$28.63
2	55	\$22.53	\$8.15	\$5.64	\$0.00	\$36.32
3	60	\$24.58	\$8.15	\$6.15	\$0.00	\$38.88
4	65	\$26.62	\$8.15	\$6.66	\$0.00	\$41.43
5	70	\$28.67	\$8.15	\$17.78	\$0.00	\$54.60
6	75	\$30.72	\$8.15	\$18.29	\$0.00	\$57.16
7	80	\$32.77	\$8.15	\$18.80	\$0.00	\$59.72
8	90	\$36.86	\$8.15	\$19.83	\$0.00	\$64.84

**Notes:**

Steps are 750 hrs.

**Apprentice to Journeyworker Ratio:1:1**

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
HOISTING ENGINEER/CRANES/GRADALLS OPERATING ENGINEERS LOCAL 4	12/01/2018	\$47.58	\$11.50	\$15.60	\$0.00	\$74.68
	06/01/2019	\$48.68	\$11.50	\$15.60	\$0.00	\$75.78
	12/01/2019	\$49.83	\$11.50	\$15.60	\$0.00	\$76.93
	06/01/2020	\$50.93	\$11.50	\$15.60	\$0.00	\$78.03
	12/01/2020	\$52.08	\$11.50	\$15.60	\$0.00	\$79.18
	06/01/2021	\$53.18	\$11.50	\$15.60	\$0.00	\$80.28
	12/01/2021	\$54.33	\$11.50	\$15.60	\$0.00	\$81.43

**Apprentice - OPERATING ENGINEERS - Local 4**

**Effective Date - 12/01/2018**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	55	\$26.17	\$11.50	\$0.00	\$0.00	\$37.67
2	60	\$28.55	\$11.50	\$15.60	\$0.00	\$55.65
3	65	\$30.93	\$11.50	\$15.60	\$0.00	\$58.03
4	70	\$33.31	\$11.50	\$15.60	\$0.00	\$60.41
5	75	\$35.69	\$11.50	\$15.60	\$0.00	\$62.79
6	80	\$38.06	\$11.50	\$15.60	\$0.00	\$65.16
7	85	\$40.44	\$11.50	\$15.60	\$0.00	\$67.54
8	90	\$42.82	\$11.50	\$15.60	\$0.00	\$69.92

**Effective Date - 06/01/2019**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	55	\$26.77	\$11.50	\$0.00	\$0.00	\$38.27
2	60	\$29.21	\$11.50	\$15.60	\$0.00	\$56.31
3	65	\$31.64	\$11.50	\$15.60	\$0.00	\$58.74
4	70	\$34.08	\$11.50	\$15.60	\$0.00	\$61.18
5	75	\$36.51	\$11.50	\$15.60	\$0.00	\$63.61
6	80	\$38.94	\$11.50	\$15.60	\$0.00	\$66.04
7	85	\$41.38	\$11.50	\$15.60	\$0.00	\$68.48
8	90	\$43.81	\$11.50	\$15.60	\$0.00	\$70.91

**Notes:**

**Apprentice to Journeyworker Ratio:1:6**

HVAC (DUCTWORK) SHEETMETAL WORKERS LOCAL 17 - A	02/01/2019	\$46.50	\$13.20	\$24.12	\$2.52	\$86.34
	08/01/2019	\$48.10	\$13.20	\$24.12	\$2.56	\$87.98
	02/01/2020	\$49.75	\$13.20	\$24.12	\$2.61	\$89.68
	08/01/2020	\$51.35	\$13.20	\$24.12	\$2.66	\$91.33
	02/01/2021	\$53.00	\$13.20	\$24.12	\$2.71	\$93.03
	08/01/2021	\$54.75	\$13.20	\$24.12	\$2.76	\$94.83
	02/01/2022	\$56.50	\$13.20	\$24.12	\$2.81	\$96.63

For apprentice rates see "Apprentice- SHEET METAL WORKER"

HVAC (ELECTRICAL CONTROLS) ELECTRICIANS LOCAL 103	03/01/2019	\$51.10	\$13.00	\$18.88	\$0.00	\$82.98
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For apprentice rates see "Apprentice- ELECTRICIAN"

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
HVAC (TESTING AND BALANCING - AIR) <i>SHEETMETAL WORKERS LOCAL 17 - A</i>	02/01/2019	\$46.50	\$13.20	\$24.12	\$2.52	\$86.34
	08/01/2019	\$48.10	\$13.20	\$24.12	\$2.56	\$87.98
	02/01/2020	\$49.75	\$13.20	\$24.12	\$2.61	\$89.68
	08/01/2020	\$51.35	\$13.20	\$24.12	\$2.66	\$91.33
	02/01/2021	\$53.00	\$13.20	\$24.12	\$2.71	\$93.03
	08/01/2021	\$54.75	\$13.20	\$24.12	\$2.76	\$94.83
	02/01/2022	\$56.50	\$13.20	\$24.12	\$2.81	\$96.63
For apprentice rates see "Apprentice- SHEET METAL WORKER"						
HVAC (TESTING AND BALANCING - WATER) <i>PIPEFITTERS LOCAL 537</i>	03/01/2019	\$53.19	\$10.95	\$19.74	\$0.00	\$83.88
	09/01/2019	\$54.69	\$10.95	\$19.74	\$0.00	\$85.38
	03/01/2020	\$56.19	\$10.95	\$19.74	\$0.00	\$86.88
	09/01/2020	\$57.69	\$10.95	\$19.74	\$0.00	\$88.38
	03/01/2021	\$59.19	\$10.95	\$19.74	\$0.00	\$89.88
For apprentice rates see "Apprentice- PIPEFITTER" or "PLUMBER/PIPEFITTER"						
HVAC MECHANIC <i>PIPEFITTERS LOCAL 537</i>	03/01/2019	\$53.19	\$10.95	\$19.74	\$0.00	\$83.88
	09/01/2019	\$54.69	\$10.95	\$19.74	\$0.00	\$85.38
	03/01/2020	\$56.19	\$10.95	\$19.74	\$0.00	\$86.88
	09/01/2020	\$57.69	\$10.95	\$19.74	\$0.00	\$88.38
	03/01/2021	\$59.19	\$10.95	\$19.74	\$0.00	\$89.88
For apprentice rates see "Apprentice- PIPEFITTER" or "PLUMBER/PIPEFITTER"						
HYDRAULIC DRILLS <i>LABORERS - ZONE 2</i>	12/01/2018	\$34.27	\$7.85	\$14.44	\$0.00	\$56.56
	06/01/2019	\$35.14	\$7.85	\$14.44	\$0.00	\$57.43
	12/01/2019	\$36.00	\$7.85	\$14.44	\$0.00	\$58.29
	06/01/2020	\$36.89	\$7.85	\$14.44	\$0.00	\$59.18
	12/01/2020	\$37.78	\$7.85	\$14.44	\$0.00	\$60.07
	06/01/2021	\$38.70	\$7.85	\$14.44	\$0.00	\$60.99
	12/01/2021	\$39.61	\$7.85	\$14.44	\$0.00	\$61.90
For apprentice rates see "Apprentice- LABORER"						
INSULATOR (PIPES & TANKS) <i>HEAT &amp; FROST INSULATORS LOCAL 6 (BOSTON)</i>	09/01/2018	\$47.09	\$12.50	\$15.60	\$0.00	\$75.19
	09/01/2019	\$49.59	\$12.50	\$15.60	\$0.00	\$77.69

**Classification**

Effective Date    Base Wage    Health    Pension    Supplemental  
Unemployment    Total Rate

**Apprentice - ASBESTOS INSULATOR (Pipes & Tanks) - Local 6 Boston**
**Effective Date - 09/01/2018**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$23.55	\$12.50	\$11.40	\$0.00	\$47.45
2	60	\$28.25	\$12.50	\$12.24	\$0.00	\$52.99
3	70	\$32.96	\$12.50	\$13.08	\$0.00	\$58.54
4	80	\$37.67	\$12.50	\$13.92	\$0.00	\$64.09

**Effective Date - 09/01/2019**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$24.80	\$12.50	\$11.40	\$0.00	\$48.70
2	60	\$29.75	\$12.50	\$12.24	\$0.00	\$54.49
3	70	\$34.71	\$12.50	\$13.08	\$0.00	\$60.29
4	80	\$39.67	\$12.50	\$13.92	\$0.00	\$66.09

**Notes:**

Steps are 1 year

**Apprentice to Journeyworker Ratio:1:4**

IRONWORKER/WELDER	09/16/2018	\$46.07	\$8.00	\$22.85	\$0.00	\$76.92
IRONWORKERS LOCAL 7 (BOSTON AREA)						

**Apprentice - IRONWORKER - Local 7 Boston**
**Effective Date - 09/16/2018**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$27.64	\$8.00	\$22.85	\$0.00	\$58.49
2	70	\$32.25	\$8.00	\$22.85	\$0.00	\$63.10
3	75	\$34.55	\$8.00	\$22.85	\$0.00	\$65.40
4	80	\$36.86	\$8.00	\$22.85	\$0.00	\$67.71
5	85	\$39.16	\$8.00	\$22.85	\$0.00	\$70.01
6	90	\$41.46	\$8.00	\$22.85	\$0.00	\$72.31

**Notes:**

\*\* Structural 1:6; Ornamental 1:4

**Apprentice to Journeyworker Ratio:\*\***

JACKHAMMER & PAVING BREAKER OPERATOR	12/01/2018	\$33.77	\$7.85	\$14.44	\$0.00	\$56.06
LABORERS - ZONE 2						
	06/01/2019	\$34.64	\$7.85	\$14.44	\$0.00	\$56.93
	12/01/2019	\$35.50	\$7.85	\$14.44	\$0.00	\$57.79
	06/01/2020	\$36.39	\$7.85	\$14.44	\$0.00	\$58.68
	12/01/2020	\$37.28	\$7.85	\$14.44	\$0.00	\$59.57
	06/01/2021	\$38.20	\$7.85	\$14.44	\$0.00	\$60.49
	12/01/2021	\$39.11	\$7.85	\$14.44	\$0.00	\$61.40

For apprentice rates see "Apprentice- LABORER"

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
LABORER LABORERS - ZONE 2	12/01/2018	\$33.52	\$7.85	\$14.44	\$0.00	\$55.81
	06/01/2019	\$34.39	\$7.85	\$14.44	\$0.00	\$56.68
	12/01/2019	\$35.25	\$7.85	\$14.44	\$0.00	\$57.54
	06/01/2020	\$36.14	\$7.85	\$14.44	\$0.00	\$58.43
	12/01/2020	\$37.03	\$7.85	\$14.44	\$0.00	\$59.32
	06/01/2021	\$37.95	\$7.85	\$14.44	\$0.00	\$60.24
	12/01/2021	\$38.86	\$7.85	\$14.44	\$0.00	\$61.15

**Apprentice - LABORER - Zone 2**

**Effective Date - 12/01/2018**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$20.11	\$7.85	\$14.44	\$0.00	\$42.40
2	70	\$23.46	\$7.85	\$14.44	\$0.00	\$45.75
3	80	\$26.82	\$7.85	\$14.44	\$0.00	\$49.11
4	90	\$30.17	\$7.85	\$14.44	\$0.00	\$52.46

**Effective Date - 06/01/2019**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$20.63	\$7.85	\$14.44	\$0.00	\$42.92
2	70	\$24.07	\$7.85	\$14.44	\$0.00	\$46.36
3	80	\$27.51	\$7.85	\$14.44	\$0.00	\$49.80
4	90	\$30.95	\$7.85	\$14.44	\$0.00	\$53.24

Notes:

**Apprentice to Journeyworker Ratio:1:5**

LABORER: CARPENTER TENDER LABORERS - ZONE 2	12/01/2018	\$33.52	\$7.85	\$14.44	\$0.00	\$55.81
	06/01/2019	\$34.39	\$7.85	\$14.44	\$0.00	\$56.68
	12/01/2019	\$35.25	\$7.85	\$14.44	\$0.00	\$57.54
	06/01/2020	\$36.14	\$7.85	\$14.44	\$0.00	\$58.43
	12/01/2020	\$37.03	\$7.85	\$14.44	\$0.00	\$59.32
	06/01/2021	\$37.95	\$7.85	\$14.44	\$0.00	\$60.24
	12/01/2021	\$38.86	\$7.85	\$14.44	\$0.00	\$61.15

For apprentice rates see "Apprentice- LABORER"

LABORER: CEMENT FINISHER TENDER LABORERS - ZONE 2	12/01/2018	\$33.52	\$7.85	\$14.44	\$0.00	\$55.81
	06/01/2019	\$34.39	\$7.85	\$14.44	\$0.00	\$56.68
	12/01/2019	\$35.25	\$7.85	\$14.44	\$0.00	\$57.54
	06/01/2020	\$36.14	\$7.85	\$14.44	\$0.00	\$58.43
	12/01/2020	\$37.03	\$7.85	\$14.44	\$0.00	\$59.32
	06/01/2021	\$37.95	\$7.85	\$14.44	\$0.00	\$60.24
	12/01/2021	\$38.86	\$7.85	\$14.44	\$0.00	\$61.15

For apprentice rates see "Apprentice- LABORER"

LABORER: HAZARDOUS WASTE/ASBESTOS REMOVER LABORERS - ZONE 2	12/01/2018	\$33.72	\$7.85	\$14.39	\$0.00	\$55.96
	06/01/2019	\$34.59	\$7.85	\$14.39	\$0.00	\$56.83
	12/01/2019	\$35.45	\$7.85	\$14.39	\$0.00	\$57.69

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
For apprentice rates see "Apprentice- LABORER"						
LABORER: MASON TENDER	12/01/2018	\$33.77	\$7.85	\$14.44	\$0.00	\$56.06
LABORERS - ZONE 2	06/01/2019	\$34.64	\$7.85	\$14.44	\$0.00	\$56.93
	12/01/2019	\$35.50	\$7.85	\$14.44	\$0.00	\$57.79
	06/01/2020	\$36.39	\$7.85	\$14.44	\$0.00	\$58.68
	12/01/2020	\$37.28	\$7.85	\$14.44	\$0.00	\$59.57
	06/01/2021	\$38.20	\$7.85	\$14.44	\$0.00	\$60.49
	12/01/2021	\$39.11	\$7.85	\$14.44	\$0.00	\$61.40
For apprentice rates see "Apprentice- LABORER"						
LABORER: MULTI-TRADE TENDER	12/01/2018	\$33.52	\$7.85	\$14.44	\$0.00	\$55.81
LABORERS - ZONE 2	06/01/2019	\$34.39	\$7.85	\$14.44	\$0.00	\$56.68
	12/01/2019	\$35.25	\$7.85	\$14.44	\$0.00	\$57.54
	06/01/2020	\$36.14	\$7.85	\$14.44	\$0.00	\$58.43
	12/01/2020	\$37.03	\$7.85	\$14.44	\$0.00	\$59.32
	06/01/2021	\$37.95	\$7.85	\$14.44	\$0.00	\$60.24
	12/01/2021	\$38.86	\$7.85	\$14.44	\$0.00	\$61.15
For apprentice rates see "Apprentice- LABORER"						
LABORER: TREE REMOVER	12/01/2018	\$33.52	\$7.85	\$14.44	\$0.00	\$55.81
LABORERS - ZONE 2	06/01/2019	\$34.39	\$7.85	\$14.44	\$0.00	\$56.68
	12/01/2019	\$35.25	\$7.85	\$14.44	\$0.00	\$57.54
	06/01/2020	\$36.14	\$7.85	\$14.44	\$0.00	\$58.43
	12/01/2020	\$37.03	\$7.85	\$14.44	\$0.00	\$59.32
	06/01/2021	\$37.95	\$7.85	\$14.44	\$0.00	\$60.24
	12/01/2021	\$38.86	\$7.85	\$14.44	\$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"						
LASER BEAM OPERATOR	12/01/2018	\$33.77	\$7.85	\$14.44	\$0.00	\$56.06
LABORERS - ZONE 2	06/01/2019	\$34.64	\$7.85	\$14.44	\$0.00	\$56.93
	12/01/2019	\$35.50	\$7.85	\$14.44	\$0.00	\$57.79
	06/01/2020	\$36.39	\$7.85	\$14.44	\$0.00	\$58.68
	12/01/2020	\$37.28	\$7.85	\$14.44	\$0.00	\$59.57
	06/01/2021	\$38.20	\$7.85	\$14.44	\$0.00	\$60.49
	12/01/2021	\$39.11	\$7.85	\$14.44	\$0.00	\$61.40
For apprentice rates see "Apprentice- LABORER"						
MARBLE & TILE FINISHERS	02/01/2019	\$40.91	\$10.75	\$18.97	\$0.00	\$70.63
BRICKLAYERS LOCAL 3 - MARBLE & TILE	08/01/2019	\$41.99	\$10.75	\$19.11	\$0.00	\$71.85
	02/01/2020	\$42.50	\$10.75	\$19.11	\$0.00	\$72.36
	08/01/2020	\$43.58	\$10.75	\$19.26	\$0.00	\$73.59
	02/01/2021	\$44.09	\$10.75	\$19.26	\$0.00	\$74.10
	08/01/2021	\$45.21	\$10.75	\$19.42	\$0.00	\$75.38
	02/01/2022	\$45.68	\$10.75	\$19.42	\$0.00	\$75.85

**Classification**

**Effective Date   Base Wage   Health   Pension   Supplemental  
Unemployment   Total Rate**

**Apprentice - MARBLE & TILE FINISHER - Local 3 Marble & Tile**

**Effective Date - 02/01/2019**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$20.46	\$10.75	\$18.97	\$0.00	\$50.18
2	60	\$24.55	\$10.75	\$18.97	\$0.00	\$54.27
3	70	\$28.64	\$10.75	\$18.97	\$0.00	\$58.36
4	80	\$32.73	\$10.75	\$18.97	\$0.00	\$62.45
5	90	\$36.82	\$10.75	\$18.97	\$0.00	\$66.54

**Effective Date - 08/01/2019**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$21.00	\$10.75	\$19.11	\$0.00	\$50.86
2	60	\$25.19	\$10.75	\$19.11	\$0.00	\$55.05
3	70	\$29.39	\$10.75	\$19.11	\$0.00	\$59.25
4	80	\$33.59	\$10.75	\$19.11	\$0.00	\$63.45
5	90	\$37.79	\$10.75	\$19.11	\$0.00	\$67.65

**Notes:**

**Apprentice to Journeyworker Ratio:1:3**

MARBLE MASONS, TILELAYERS & TERRAZZO MECH	02/01/2019	\$53.57	\$10.75	\$20.66	\$0.00	\$84.98
BRICKLAYERS LOCAL 3 - MARBLE & TILE	08/01/2019	\$54.92	\$10.75	\$20.80	\$0.00	\$86.47
	02/01/2020	\$55.55	\$10.75	\$20.80	\$0.00	\$87.10
	08/01/2020	\$56.90	\$10.75	\$20.95	\$0.00	\$88.60
	02/01/2021	\$57.54	\$10.75	\$20.95	\$0.00	\$89.24
	08/01/2021	\$58.94	\$10.75	\$21.11	\$0.00	\$90.80
	02/01/2022	\$59.51	\$10.75	\$21.11	\$0.00	\$91.37

**Classification**

Effective Date    Base Wage    Health    Pension    Supplemental  
Unemployment    Total Rate

**Apprentice - MARBLE-TILE-TERRAZZO MECHANIC - Local 3 Marble & Tile**

Effective Date - 02/01/2019

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$26.79	\$10.75	\$20.66	\$0.00	\$58.20
2	60	\$32.14	\$10.75	\$20.66	\$0.00	\$63.55
3	70	\$37.50	\$10.75	\$20.66	\$0.00	\$68.91
4	80	\$42.86	\$10.75	\$20.66	\$0.00	\$74.27
5	90	\$48.21	\$10.75	\$20.66	\$0.00	\$79.62

Effective Date - 08/01/2019

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$27.46	\$10.75	\$20.80	\$0.00	\$59.01
2	60	\$32.95	\$10.75	\$20.80	\$0.00	\$64.50
3	70	\$38.44	\$10.75	\$20.80	\$0.00	\$69.99
4	80	\$43.94	\$10.75	\$20.80	\$0.00	\$75.49
5	90	\$49.43	\$10.75	\$20.80	\$0.00	\$80.98

Notes:

Apprentice to Journeyworker Ratio:1:5

MECH. SWEEPER OPERATOR (ON CONST. SITES)	12/01/2018	\$47.10	\$11.50	\$15.60	\$0.00	\$74.20
OPERATING ENGINEERS LOCAL 4	06/01/2019	\$48.19	\$11.50	\$15.60	\$0.00	\$75.29
	12/01/2019	\$49.33	\$11.50	\$15.60	\$0.00	\$76.43
	06/01/2020	\$50.41	\$11.50	\$15.60	\$0.00	\$77.51
	12/01/2020	\$51.55	\$11.50	\$15.60	\$0.00	\$78.65
	06/01/2021	\$52.64	\$11.50	\$15.60	\$0.00	\$79.74
	12/01/2021	\$53.78	\$11.50	\$15.60	\$0.00	\$80.88

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

MECHANICS MAINTENANCE	12/01/2018	\$47.10	\$11.50	\$15.60	\$0.00	\$74.20
OPERATING ENGINEERS LOCAL 4	06/01/2019	\$48.19	\$11.50	\$15.60	\$0.00	\$75.29
	12/01/2019	\$49.33	\$11.50	\$15.60	\$0.00	\$76.43
	06/01/2020	\$50.41	\$11.50	\$15.60	\$0.00	\$77.51
	12/01/2020	\$51.55	\$11.50	\$15.60	\$0.00	\$78.65
	06/01/2021	\$52.64	\$11.50	\$15.60	\$0.00	\$79.74
	12/01/2021	\$53.78	\$11.50	\$15.60	\$0.00	\$80.88

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

MILLWRIGHT (Zone 2)	10/01/2018	\$38.02	\$9.90	\$18.50	\$0.00	\$66.42
MILLWRIGHTS LOCAL 1121 - Zone 2	04/01/2019	\$38.87	\$9.90	\$18.50	\$0.00	\$67.27

**Classification**

Effective Date    Base Wage    Health    Pension    Supplemental  
Unemployment    Total Rate

**Apprentice - MILLWRIGHT - Local 1121 Zone 2**
**Effective Date - 10/01/2018**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	55	\$20.91	\$9.90	\$5.31	\$0.00	\$36.12
2	65	\$24.71	\$9.90	\$15.13	\$0.00	\$49.74
3	75	\$28.52	\$9.90	\$16.10	\$0.00	\$54.52
4	85	\$32.32	\$9.90	\$17.06	\$0.00	\$59.28

**Effective Date - 04/01/2019**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	55	\$21.38	\$9.90	\$5.31	\$0.00	\$36.59
2	65	\$25.27	\$9.90	\$15.13	\$0.00	\$50.30
3	75	\$29.15	\$9.90	\$16.10	\$0.00	\$55.15
4	85	\$33.04	\$9.90	\$17.06	\$0.00	\$60.00

**Notes:**

Steps are 2,000 hours

**Apprentice to Journeyworker Ratio:1:5**
**MORTAR MIXER**
*LABORERS - ZONE 2*

12/01/2018	\$33.77	\$7.85	\$14.44	\$0.00	\$56.06
06/01/2019	\$34.64	\$7.85	\$14.44	\$0.00	\$56.93
12/01/2019	\$35.50	\$7.85	\$14.44	\$0.00	\$57.79
06/01/2020	\$36.39	\$7.85	\$14.44	\$0.00	\$58.68
12/01/2020	\$37.28	\$7.85	\$14.44	\$0.00	\$59.57
06/01/2021	\$38.20	\$7.85	\$14.44	\$0.00	\$60.49
12/01/2021	\$39.11	\$7.85	\$14.44	\$0.00	\$61.40

For apprentice rates see "Apprentice- LABORER"

**OILER (OTHER THAN TRUCK CRANES,GRADALLS)**
*OPERATING ENGINEERS LOCAL 4*

12/01/2018	\$23.06	\$11.50	\$15.60	\$0.00	\$50.16
06/01/2019	\$23.61	\$11.50	\$15.60	\$0.00	\$50.71
12/01/2019	\$24.18	\$11.50	\$15.60	\$0.00	\$51.28
06/01/2020	\$24.73	\$11.50	\$15.60	\$0.00	\$51.83
12/01/2020	\$25.30	\$11.50	\$15.60	\$0.00	\$52.40
06/01/2021	\$25.85	\$11.50	\$15.60	\$0.00	\$52.95
12/01/2021	\$26.43	\$11.50	\$15.60	\$0.00	\$53.53

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

**OILER (TRUCK CRANES, GRADALLS)**
*OPERATING ENGINEERS LOCAL 4*

12/01/2018	\$27.42	\$11.50	\$15.60	\$0.00	\$54.52
06/01/2019	\$28.07	\$11.50	\$15.60	\$0.00	\$55.17
12/01/2019	\$28.74	\$11.50	\$15.60	\$0.00	\$55.84
06/01/2020	\$29.39	\$11.50	\$15.60	\$0.00	\$56.49
12/01/2020	\$30.07	\$11.50	\$15.60	\$0.00	\$57.17
06/01/2021	\$30.71	\$11.50	\$15.60	\$0.00	\$57.81
12/01/2021	\$31.39	\$11.50	\$15.60	\$0.00	\$58.49

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
OTHER POWER DRIVEN EQUIPMENT - CLASS II <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2018	\$47.10	\$11.50	\$15.60	\$0.00	\$74.20
	06/01/2019	\$48.19	\$11.50	\$15.60	\$0.00	\$75.29
	12/01/2019	\$49.33	\$11.50	\$15.60	\$0.00	\$76.43
	06/01/2020	\$50.41	\$11.50	\$15.60	\$0.00	\$77.51
	12/01/2020	\$51.55	\$11.50	\$15.60	\$0.00	\$78.65
	06/01/2021	\$52.64	\$11.50	\$15.60	\$0.00	\$79.74
	12/01/2021	\$53.78	\$11.50	\$15.60	\$0.00	\$80.88
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						

PAINTER (BRIDGES/TANKS) <i>PAINTERS LOCAL 35 - ZONE 2</i>	01/01/2019	\$50.36	\$8.15	\$20.85	\$0.00	\$79.36
	07/01/2019	\$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
	01/01/2021	\$54.76	\$8.15	\$20.85	\$0.00	\$83.76

**Apprentice - PAINTER Local 35 - BRIDGES/TANKS**

**Effective Date - 01/01/2019**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$25.18	\$8.15	\$0.00	\$0.00	\$33.33
2	55	\$27.70	\$8.15	\$5.64	\$0.00	\$41.49
3	60	\$30.22	\$8.15	\$6.15	\$0.00	\$44.52
4	65	\$32.73	\$8.15	\$6.66	\$0.00	\$47.54
5	70	\$35.25	\$8.15	\$17.78	\$0.00	\$61.18
6	75	\$37.77	\$8.15	\$18.29	\$0.00	\$64.21
7	80	\$40.29	\$8.15	\$18.80	\$0.00	\$67.24
8	90	\$45.32	\$8.15	\$19.83	\$0.00	\$73.30

**Effective Date - 07/01/2019**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$25.73	\$8.15	\$0.00	\$0.00	\$33.88
2	55	\$28.30	\$8.15	\$5.64	\$0.00	\$42.09
3	60	\$30.88	\$8.15	\$6.15	\$0.00	\$45.18
4	65	\$33.45	\$8.15	\$6.66	\$0.00	\$48.26
5	70	\$36.02	\$8.15	\$17.78	\$0.00	\$61.95
6	75	\$38.60	\$8.15	\$18.29	\$0.00	\$65.04
7	80	\$41.17	\$8.15	\$18.80	\$0.00	\$68.12
8	90	\$46.31	\$8.15	\$19.83	\$0.00	\$74.29

**Notes:**

Steps are 750 hrs.

**Apprentice to Journeyworker Ratio:1:1**

PAINTER (SPRAY OR SANDBLAST, NEW) *	01/01/2019	\$41.26	\$8.15	\$20.85	\$0.00	\$70.26
* If 30% or more of surfaces to be painted are new construction, NEW paint rate shall be used. <i>PAINTERS LOCAL 35 - ZONE 2</i>	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

**Classification**

**Effective Date   Base Wage   Health   Pension   Supplemental Unemployment   Total Rate**

**Apprentice - PAINTER Local 35 Zone 2 - Spray/Sandblast - New**

**Effective Date - 01/01/2019**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$20.63	\$8.15	\$0.00	\$0.00	\$28.78
2	55	\$22.69	\$8.15	\$5.64	\$0.00	\$36.48
3	60	\$24.76	\$8.15	\$6.15	\$0.00	\$39.06
4	65	\$26.82	\$8.15	\$6.66	\$0.00	\$41.63
5	70	\$28.88	\$8.15	\$17.78	\$0.00	\$54.81
6	75	\$30.95	\$8.15	\$18.29	\$0.00	\$57.39
7	80	\$33.01	\$8.15	\$18.80	\$0.00	\$59.96
8	90	\$37.13	\$8.15	\$19.83	\$0.00	\$65.11

**Effective Date - 07/01/2019**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$21.18	\$8.15	\$0.00	\$0.00	\$29.33
2	55	\$23.30	\$8.15	\$5.64	\$0.00	\$37.09
3	60	\$25.42	\$8.15	\$6.15	\$0.00	\$39.72
4	65	\$27.53	\$8.15	\$6.66	\$0.00	\$42.34
5	70	\$29.65	\$8.15	\$17.78	\$0.00	\$55.58
6	75	\$31.77	\$8.15	\$18.29	\$0.00	\$58.21
7	80	\$33.89	\$8.15	\$18.80	\$0.00	\$60.84
8	90	\$38.12	\$8.15	\$19.83	\$0.00	\$66.10

**Notes:**

Steps are 750 hrs.

**Apprentice to Journeyworker Ratio:1:1**

PAINTER (SPRAY OR SANDBLAST, REPAINT)	01/01/2019	\$39.32	\$8.15	\$20.85	\$0.00	\$68.32
PAINTERS LOCAL 35 - ZONE 2	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	\$42.62	\$8.15	\$20.85	\$0.00	\$71.62
	01/01/2021	\$43.72	\$8.15	\$20.85	\$0.00	\$72.72

**Classification**

**Effective Date   Base Wage   Health   Pension   Supplemental Unemployment   Total Rate**

**Apprentice - PAINTER Local 35 Zone 2 - Spray/Sandblast - Repaint**
**Effective Date - 01/01/2019**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$19.66	\$8.15	\$0.00	\$0.00	\$27.81
2	55	\$21.63	\$8.15	\$5.64	\$0.00	\$35.42
3	60	\$23.59	\$8.15	\$6.15	\$0.00	\$37.89
4	65	\$25.56	\$8.15	\$6.66	\$0.00	\$40.37
5	70	\$27.52	\$8.15	\$17.78	\$0.00	\$53.45
6	75	\$29.49	\$8.15	\$18.29	\$0.00	\$55.93
7	80	\$31.46	\$8.15	\$18.80	\$0.00	\$58.41
8	90	\$35.39	\$8.15	\$19.83	\$0.00	\$63.37

**Effective Date - 07/01/2019**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$20.21	\$8.15	\$0.00	\$0.00	\$28.36
2	55	\$22.23	\$8.15	\$5.64	\$0.00	\$36.02
3	60	\$24.25	\$8.15	\$6.15	\$0.00	\$38.55
4	65	\$26.27	\$8.15	\$6.66	\$0.00	\$41.08
5	70	\$28.29	\$8.15	\$17.78	\$0.00	\$54.22
6	75	\$30.32	\$8.15	\$18.29	\$0.00	\$56.76
7	80	\$32.34	\$8.15	\$18.80	\$0.00	\$59.29
8	90	\$36.38	\$8.15	\$19.83	\$0.00	\$64.36

**Notes:**

Steps are 750 hrs.

**Apprentice to Journeyworker Ratio:1:1**
**PAINTER (TRAFFIC MARKINGS)**
*LABORERS - ZONE 2*

12/01/2018	\$33.52	\$7.85	\$14.44	\$0.00	\$55.81
06/01/2019	\$34.39	\$7.85	\$14.44	\$0.00	\$56.68
12/01/2019	\$35.25	\$7.85	\$14.44	\$0.00	\$57.54
06/01/2020	\$36.14	\$7.85	\$14.44	\$0.00	\$58.43
12/01/2020	\$37.03	\$7.85	\$14.44	\$0.00	\$59.32
06/01/2021	\$37.95	\$7.85	\$14.44	\$0.00	\$60.24
12/01/2021	\$38.86	\$7.85	\$14.44	\$0.00	\$61.15

For Apprentice rates see "Apprentice- LABORER"

**PAINTER / TAPER (BRUSH, NEW) \***

\* If 30% or more of surfaces to be painted are new construction,  
NEW paint rate shall be used. *PAINTERS LOCAL 35 - ZONE 2*

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	\$44.25	\$8.15	\$20.85	\$0.00	\$73.25

**Classification**

**Effective Date   Base Wage   Health   Pension   Supplemental Unemployment   Total Rate**

**Apprentice - PAINTER - Local 35 Zone 2 - BRUSH NEW**

**Effective Date - 01/01/2019**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$19.93	\$8.15	\$0.00	\$0.00	\$28.08
2	55	\$21.92	\$8.15	\$5.64	\$0.00	\$35.71
3	60	\$23.92	\$8.15	\$6.15	\$0.00	\$38.22
4	65	\$25.91	\$8.15	\$6.66	\$0.00	\$40.72
5	70	\$27.90	\$8.15	\$17.78	\$0.00	\$53.83
6	75	\$29.90	\$8.15	\$18.29	\$0.00	\$56.34
7	80	\$31.89	\$8.15	\$18.80	\$0.00	\$58.84
8	90	\$35.87	\$8.15	\$19.83	\$0.00	\$63.85

**Effective Date - 07/01/2019**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$20.48	\$8.15	\$0.00	\$0.00	\$28.63
2	55	\$22.53	\$8.15	\$5.64	\$0.00	\$36.32
3	60	\$24.58	\$8.15	\$6.15	\$0.00	\$38.88
4	65	\$26.62	\$8.15	\$6.66	\$0.00	\$41.43
5	70	\$28.67	\$8.15	\$17.78	\$0.00	\$54.60
6	75	\$30.72	\$8.15	\$18.29	\$0.00	\$57.16
7	80	\$32.77	\$8.15	\$18.80	\$0.00	\$59.72
8	90	\$36.86	\$8.15	\$19.83	\$0.00	\$64.84

**Notes:**

Steps are 750 hrs.

**Apprentice to Journeyworker Ratio:1:1**

PAINTER / TAPER (BRUSH, REPAINT)	01/01/2019	\$37.92	\$8.15	\$20.85	\$0.00	\$66.92
PAINTERS LOCAL 35 - ZONE 2	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	\$71.32

**Classification**

Effective Date    Base Wage    Health    Pension    Supplemental  
Unemployment    Total Rate

**Apprentice - PAINTER Local 35 Zone 2 - BRUSH REPAINT**
**Effective Date - 01/01/2019**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$18.96	\$8.15	\$0.00	\$0.00	\$27.11
2	55	\$20.86	\$8.15	\$5.64	\$0.00	\$34.65
3	60	\$22.75	\$8.15	\$6.15	\$0.00	\$37.05
4	65	\$24.65	\$8.15	\$6.66	\$0.00	\$39.46
5	70	\$26.54	\$8.15	\$17.78	\$0.00	\$52.47
6	75	\$28.44	\$8.15	\$18.29	\$0.00	\$54.88
7	80	\$30.34	\$8.15	\$18.80	\$0.00	\$57.29
8	90	\$34.13	\$8.15	\$19.83	\$0.00	\$62.11

**Effective Date - 07/01/2019**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$19.51	\$8.15	\$0.00	\$0.00	\$27.66
2	55	\$21.46	\$8.15	\$5.64	\$0.00	\$35.25
3	60	\$23.41	\$8.15	\$6.15	\$0.00	\$37.71
4	65	\$25.36	\$8.15	\$6.66	\$0.00	\$40.17
5	70	\$27.31	\$8.15	\$17.78	\$0.00	\$53.24
6	75	\$29.27	\$8.15	\$18.29	\$0.00	\$55.71
7	80	\$31.22	\$8.15	\$18.80	\$0.00	\$58.17
8	90	\$35.12	\$8.15	\$19.83	\$0.00	\$63.10

**Notes:**

Steps are 750 hrs.

**Apprentice to Journeyworker Ratio:1:1**
**PANEL & PICKUP TRUCKS DRIVER**
*TEAMSTERS JOINT COUNCIL NO. 10 ZONE B*

12/01/2018	\$33.08	\$11.91	\$12.70	\$0.00	\$57.69
06/01/2019	\$34.08	\$11.91	\$12.70	\$0.00	\$58.69
08/01/2019	\$34.08	\$12.41	\$12.70	\$0.00	\$59.19
12/01/2019	\$34.08	\$12.41	\$13.72	\$0.00	\$60.21
06/01/2020	\$34.98	\$12.41	\$13.72	\$0.00	\$61.11
08/01/2020	\$34.98	\$12.91	\$13.72	\$0.00	\$61.61
12/01/2020	\$34.98	\$12.91	\$14.82	\$0.00	\$62.71
06/01/2021	\$35.78	\$12.91	\$14.82	\$0.00	\$63.51
08/01/2021	\$35.78	\$13.41	\$14.82	\$0.00	\$64.01
12/01/2021	\$35.78	\$13.41	\$16.01	\$0.00	\$65.20

**PIER AND DOCK CONSTRUCTOR (UNDERPINNING AND DECK)**
*PILE DRIVER LOCAL 56 (ZONE 1)*

For apprentice rates see "Apprentice- PILE DRIVER"

08/01/2018	\$46.57	\$9.90	\$21.15	\$0.00	\$77.62
08/01/2019	\$48.94	\$9.90	\$21.15	\$0.00	\$79.99

**PILE DRIVER**
*PILE DRIVER LOCAL 56 (ZONE 1)*

08/01/2018	\$46.57	\$9.90	\$21.15	\$0.00	\$77.62
08/01/2019	\$48.94	\$9.90	\$21.15	\$0.00	\$79.99

**Classification**

**Effective Date   Base Wage   Health   Pension   Supplemental Unemployment   Total Rate**

**Apprentice - PILE DRIVER - Local 56 Zone 1**

**Effective Date - 08/01/2018**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental 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

**Effective Date - 08/01/2019**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$24.47	\$9.90	\$21.15	\$0.00	\$55.52
2	60	\$29.36	\$9.90	\$21.15	\$0.00	\$60.41
3	70	\$34.26	\$9.90	\$21.15	\$0.00	\$65.31
4	75	\$36.71	\$9.90	\$21.15	\$0.00	\$67.76
5	80	\$39.15	\$9.90	\$21.15	\$0.00	\$70.20
6	80	\$39.15	\$9.90	\$21.15	\$0.00	\$70.20
7	90	\$44.05	\$9.90	\$21.15	\$0.00	\$75.10
8	90	\$44.05	\$9.90	\$21.15	\$0.00	\$75.10

**Notes:**

**Apprentice to Journeyworker Ratio:1:5**

PIPEFITTER & STEAMFITTER	03/01/2019	\$53.19	\$10.95	\$19.74	\$0.00	\$83.88
PIPEFITTERS LOCAL 537	09/01/2019	\$54.69	\$10.95	\$19.74	\$0.00	\$85.38
	03/01/2020	\$56.19	\$10.95	\$19.74	\$0.00	\$86.88
	09/01/2020	\$57.69	\$10.95	\$19.74	\$0.00	\$88.38
	03/01/2021	\$59.19	\$10.95	\$19.74	\$0.00	\$89.88

## Classification

Effective Date    Base Wage    Health    Pension    Supplemental  
Unemployment    Total Rate**Apprentice - PIPEFITTER - Local 537****Effective Date - 03/01/2019**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	\$21.28	\$10.95	\$8.00	\$0.00	\$40.23
2	45	\$23.94	\$10.95	\$19.74	\$0.00	\$54.63
3	60	\$31.91	\$10.95	\$19.74	\$0.00	\$62.60
4	70	\$37.23	\$10.95	\$19.74	\$0.00	\$67.92
5	80	\$42.55	\$10.95	\$19.74	\$0.00	\$73.24

**Effective Date - 09/01/2019**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	\$21.88	\$10.95	\$8.00	\$0.00	\$40.83
2	45	\$24.61	\$10.95	\$19.74	\$0.00	\$55.30
3	60	\$32.81	\$10.95	\$19.74	\$0.00	\$63.50
4	70	\$38.28	\$10.95	\$19.74	\$0.00	\$68.97
5	80	\$43.75	\$10.95	\$19.74	\$0.00	\$74.44

**Notes:**

\*\* 1:3; 3:15; 1:10 thereafter / Steps are 1 yr.

Refrig/AC Mechanic \*\*1:1;1:2;2:4;3:6;4:8;5:10;6:12;7:14;8:17;9:20;10:23(Max)

**Apprentice to Journeyworker Ratio:\*\***

PIPELAYER	12/01/2018	\$33.77	\$7.85	\$14.44	\$0.00	\$56.06
LABORERS - ZONE 2	06/01/2019	\$34.64	\$7.85	\$14.44	\$0.00	\$56.93
	12/01/2019	\$35.50	\$7.85	\$14.44	\$0.00	\$57.79
	06/01/2020	\$36.39	\$7.85	\$14.44	\$0.00	\$58.68
	12/01/2020	\$37.28	\$7.85	\$14.44	\$0.00	\$59.57
	06/01/2021	\$38.20	\$7.85	\$14.44	\$0.00	\$60.49
	12/01/2021	\$39.11	\$7.85	\$14.44	\$0.00	\$61.40
For apprentice rates see "Apprentice- LABORER"						
PLUMBERS & GASFITTERS	03/01/2019	\$56.69	\$11.82	\$16.51	\$0.00	\$85.02
PLUMBERS & GASFITTERS LOCAL 12	09/01/2019	\$58.19	\$11.82	\$16.51	\$0.00	\$86.52
	03/01/2020	\$59.69	\$11.82	\$16.51	\$0.00	\$88.02
	09/01/2020	\$61.19	\$11.82	\$16.51	\$0.00	\$89.52
	03/01/2021	\$62.69	\$11.82	\$16.51	\$0.00	\$91.02

**Classification**

**Effective Date   Base Wage   Health   Pension   Supplemental Unemployment   Total Rate**

**Apprentice - PLUMBER/GASFITTER - Local 12**
**Effective Date - 03/01/2019**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	35	\$19.84	\$11.82	\$5.98	\$0.00	\$37.64
2	40	\$22.68	\$11.82	\$6.79	\$0.00	\$41.29
3	55	\$31.18	\$11.82	\$9.25	\$0.00	\$52.25
4	65	\$36.85	\$11.82	\$10.85	\$0.00	\$59.52
5	75	\$42.52	\$11.82	\$12.50	\$0.00	\$66.84

**Effective Date - 09/01/2019**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	35	\$20.37	\$11.82	\$5.98	\$0.00	\$38.17
2	40	\$23.28	\$11.82	\$6.79	\$0.00	\$41.89
3	55	\$32.00	\$11.82	\$9.25	\$0.00	\$53.07
4	65	\$37.82	\$11.82	\$10.85	\$0.00	\$60.49
5	75	\$43.64	\$11.82	\$12.50	\$0.00	\$67.96

**Notes:**

\*\* 1:2; 2:6; 3:10; 4:14; 5:19/Steps are 1 yr  
Step4 with lic\$63.17, Step5 with lic\$70.47

**Apprentice to Journeyworker Ratio:\*\***

PNEUMATIC CONTROLS (TEMP.)	03/01/2019	\$53.19	\$10.95	\$19.74	\$0.00	\$83.88
PIPEFITTERS LOCAL 537	09/01/2019	\$54.69	\$10.95	\$19.74	\$0.00	\$85.38
	03/01/2020	\$56.19	\$10.95	\$19.74	\$0.00	\$86.88
	09/01/2020	\$57.69	\$10.95	\$19.74	\$0.00	\$88.38
	03/01/2021	\$59.17	\$10.95	\$19.74	\$0.00	\$89.86

For apprentice rates see "Apprentice- PIPEFITTER" or "PLUMBER/PIPEFITTER"

PNEUMATIC DRILL/TOOL OPERATOR	12/01/2018	\$33.77	\$7.85	\$14.44	\$0.00	\$56.06
LABORERS - ZONE 2	06/01/2019	\$34.64	\$7.85	\$14.44	\$0.00	\$56.93
	12/01/2019	\$35.50	\$7.85	\$14.44	\$0.00	\$57.79
	06/01/2020	\$36.39	\$7.85	\$14.44	\$0.00	\$58.68
	12/01/2020	\$37.28	\$7.85	\$14.44	\$0.00	\$59.57
	06/01/2021	\$38.20	\$7.85	\$14.44	\$0.00	\$60.49
	12/01/2021	\$39.11	\$7.85	\$14.44	\$0.00	\$61.40

For apprentice rates see "Apprentice- LABORER"

POWDERMAN & BLASTER	12/01/2018	\$34.52	\$7.85	\$14.44	\$0.00	\$56.81
LABORERS - ZONE 2	06/01/2019	\$35.39	\$7.85	\$14.44	\$0.00	\$57.68
	12/01/2019	\$36.25	\$7.85	\$14.44	\$0.00	\$58.54
	06/01/2020	\$37.14	\$7.85	\$14.44	\$0.00	\$59.43
	12/01/2020	\$38.03	\$7.85	\$14.44	\$0.00	\$60.32
	06/01/2021	\$38.95	\$7.85	\$14.44	\$0.00	\$61.24
	12/01/2021	\$39.86	\$7.85	\$14.44	\$0.00	\$62.15

For apprentice rates see "Apprentice- LABORER"

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
POWER SHOVEL/DERRICK/TRENCHING MACHINE <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2018	\$47.58	\$11.50	\$15.60	\$0.00	\$74.68
	06/01/2019	\$48.68	\$11.50	\$15.60	\$0.00	\$75.78
	12/01/2019	\$49.83	\$11.50	\$15.60	\$0.00	\$76.93
	06/01/2020	\$50.93	\$11.50	\$15.60	\$0.00	\$78.03
	12/01/2020	\$52.08	\$11.50	\$15.60	\$0.00	\$79.18
	06/01/2021	\$53.18	\$11.50	\$15.60	\$0.00	\$80.28
	12/01/2021	\$54.33	\$11.50	\$15.60	\$0.00	\$81.43
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
PUMP OPERATOR (CONCRETE) <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2018	\$47.58	\$11.50	\$15.60	\$0.00	\$74.68
	06/01/2019	\$48.68	\$11.50	\$15.60	\$0.00	\$75.78
	12/01/2019	\$49.83	\$11.50	\$15.60	\$0.00	\$76.93
	06/01/2020	\$50.93	\$11.50	\$15.60	\$0.00	\$78.03
	12/01/2020	\$52.08	\$11.50	\$15.60	\$0.00	\$79.18
	06/01/2021	\$53.18	\$11.50	\$15.60	\$0.00	\$80.28
	12/01/2021	\$54.33	\$11.50	\$15.60	\$0.00	\$81.43
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
PUMP OPERATOR (DEWATERING, OTHER) <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2018	\$32.03	\$11.50	\$15.60	\$0.00	\$59.13
	06/01/2019	\$32.78	\$11.50	\$15.60	\$0.00	\$59.88
	12/01/2019	\$33.57	\$11.50	\$15.60	\$0.00	\$60.67
	06/01/2020	\$34.32	\$11.50	\$15.60	\$0.00	\$61.42
	12/01/2020	\$35.10	\$11.50	\$15.60	\$0.00	\$62.20
	06/01/2021	\$35.85	\$11.50	\$15.60	\$0.00	\$62.95
	12/01/2021	\$36.64	\$11.50	\$15.60	\$0.00	\$63.74
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 <i>TEAMSTERS LOCAL 25c</i>	07/01/2017	\$29.48	\$8.48	\$9.72	\$0.00	\$47.68
RECLAIMERS <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2018	\$47.10	\$11.50	\$15.60	\$0.00	\$74.20
	06/01/2019	\$48.19	\$11.50	\$15.60	\$0.00	\$75.29
	12/01/2019	\$49.33	\$11.50	\$15.60	\$0.00	\$76.43
	06/01/2020	\$50.41	\$11.50	\$15.60	\$0.00	\$77.51
	12/01/2020	\$51.55	\$11.50	\$15.60	\$0.00	\$78.65
	06/01/2021	\$52.64	\$11.50	\$15.60	\$0.00	\$79.74
	12/01/2021	\$53.78	\$11.50	\$15.60	\$0.00	\$80.88
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
RIDE-ON MOTORIZED BUGGY OPERATOR <i>LABORERS - ZONE 2</i>	12/01/2018	\$33.77	\$7.85	\$14.44	\$0.00	\$56.06
	06/01/2019	\$34.64	\$7.85	\$14.44	\$0.00	\$56.93
	12/01/2019	\$35.50	\$7.85	\$14.44	\$0.00	\$57.79
	06/01/2020	\$36.39	\$7.85	\$14.44	\$0.00	\$58.68
	12/01/2020	\$37.28	\$7.85	\$14.44	\$0.00	\$59.57
	06/01/2021	\$38.20	\$7.85	\$14.44	\$0.00	\$60.49
	12/01/2021	\$39.11	\$7.85	\$14.44	\$0.00	\$61.40
For apprentice rates see "Apprentice- LABORER"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
ROLLER/SPREADER/MULCHING MACHINE <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2018	\$47.10	\$11.50	\$15.60	\$0.00	\$74.20
	06/01/2019	\$48.19	\$11.50	\$15.60	\$0.00	\$75.29
	12/01/2019	\$49.33	\$11.50	\$15.60	\$0.00	\$76.43
	06/01/2020	\$50.41	\$11.50	\$15.60	\$0.00	\$77.51
	12/01/2020	\$51.55	\$11.50	\$15.60	\$0.00	\$78.65
	06/01/2021	\$52.64	\$11.50	\$15.60	\$0.00	\$79.74
	12/01/2021	\$53.78	\$11.50	\$15.60	\$0.00	\$80.88
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
ROOFER (Inc.Roofing Waterproofing &Roofing Dampproofing) <i>ROOFERS LOCAL 33</i>	02/01/2019	\$43.36	\$11.50	\$15.90	\$0.00	\$70.76

**Apprentice - ROOFER - Local 33**

**Effective Date - 02/01/2019**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$21.68	\$11.50	\$3.69	\$0.00	\$36.87
2	60	\$26.02	\$11.50	\$15.90	\$0.00	\$53.42
3	65	\$28.18	\$11.50	\$15.90	\$0.00	\$55.58
4	75	\$32.52	\$11.50	\$15.90	\$0.00	\$59.92
5	85	\$36.86	\$11.50	\$15.90	\$0.00	\$64.26

**Notes: \*\* 1:5, 2:6-10, the 1:10; Reroofing: 1:4, then 1:1**  
 Step 1 is 2000 hrs.; Steps 2-5 are 1000 hrs.  
 (Hot Pitch Mechanics' receive \$1.00 hr. above ROOFER)

**Apprentice to Journeyworker Ratio:\*\***

ROOFER SLATE / TILE / PRECAST CONCRETE <i>ROOFERS LOCAL 33</i>	02/01/2019	\$43.61	\$11.50	\$15.90	\$0.00	\$71.01
For apprentice rates see "Apprentice- ROOFER"						
SHEETMETAL WORKER <i>SHEETMETAL WORKERS LOCAL 17 - A</i>	02/01/2019	\$46.50	\$13.20	\$24.12	\$2.52	\$86.34
	08/01/2019	\$48.10	\$13.20	\$24.12	\$2.56	\$87.98
	02/01/2020	\$49.75	\$13.20	\$24.12	\$2.61	\$89.68
	08/01/2020	\$51.35	\$13.20	\$24.12	\$2.66	\$91.33
	02/01/2021	\$53.00	\$13.20	\$24.12	\$2.71	\$93.03
	08/01/2021	\$54.75	\$13.20	\$24.12	\$2.76	\$94.83
	02/01/2022	\$56.50	\$13.20	\$24.12	\$2.81	\$96.63

Classification

Effective Date    Base Wage    Health    Pension    Supplemental  
Unemployment    Total Rate

Apprentice - SHEET METAL WORKER - Local 17-A

Effective Date - 02/01/2019

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	42	\$19.53	\$13.20	\$5.89	\$0.00	\$38.62
2	42	\$19.53	\$13.20	\$5.89	\$0.00	\$38.62
3	47	\$21.86	\$13.20	\$11.13	\$1.39	\$47.58
4	47	\$21.86	\$13.20	\$11.13	\$1.39	\$47.58
5	52	\$24.18	\$13.20	\$12.08	\$1.48	\$50.94
6	52	\$24.18	\$13.20	\$12.33	\$1.49	\$51.20
7	60	\$27.90	\$13.20	\$13.70	\$1.64	\$56.44
8	65	\$30.23	\$13.20	\$14.65	\$1.74	\$59.82
9	75	\$34.88	\$13.20	\$16.56	\$1.94	\$66.58
10	85	\$39.53	\$13.20	\$17.96	\$2.12	\$72.81

Effective Date - 08/01/2019

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	42	\$20.20	\$13.20	\$5.89	\$0.00	\$39.29
2	42	\$20.20	\$13.20	\$5.89	\$0.00	\$39.29
3	47	\$22.61	\$13.20	\$11.13	\$1.41	\$48.35
4	47	\$22.61	\$13.20	\$11.13	\$1.41	\$48.35
5	52	\$25.01	\$13.20	\$12.08	\$1.51	\$51.80
6	52	\$25.01	\$13.20	\$12.33	\$1.52	\$52.06
7	60	\$28.86	\$13.20	\$13.70	\$1.67	\$57.43
8	65	\$31.27	\$13.20	\$14.65	\$1.77	\$60.89
9	75	\$36.08	\$13.20	\$16.56	\$1.98	\$67.82
10	85	\$40.89	\$13.20	\$17.96	\$2.16	\$74.21

Notes:

Steps are 6 mos.

Apprentice to Journeyworker Ratio:1:4

SIGN ERECTOR

PAINTERS LOCAL 35 - ZONE 2

06/01/2013    \$25.81    \$7.07    \$7.05    \$0.00    \$39.93

Classification

Effective Date    Base Wage    Health    Pension    Supplemental  
Unemployment    Total Rate

**Apprentice - SIGN ERECTOR - Local 35 Zone 2**

Effective Date - 06/01/2013

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$12.91	\$7.07	\$0.00	\$0.00	\$19.98
2	55	\$14.20	\$7.07	\$2.45	\$0.00	\$23.72
3	60	\$15.49	\$7.07	\$2.45	\$0.00	\$25.01
4	65	\$16.78	\$7.07	\$2.45	\$0.00	\$26.30
5	70	\$18.07	\$7.07	\$7.05	\$0.00	\$32.19
6	75	\$19.36	\$7.07	\$7.05	\$0.00	\$33.48
7	80	\$20.65	\$7.07	\$7.05	\$0.00	\$34.77
8	85	\$21.94	\$7.07	\$7.05	\$0.00	\$36.06
9	90	\$23.23	\$7.07	\$7.05	\$0.00	\$37.35

**Notes:**

Steps are 4 mos.

**Apprentice to Journeyworker Ratio:1:1**

**SPECIALIZED EARTH MOVING EQUIP < 35 TONS**

TEAMSTERS JOINT COUNCIL NO. 10 ZONE B

12/01/2018	\$33.54	\$11.91	\$12.70	\$0.00	\$58.15
06/01/2019	\$34.54	\$11.91	\$12.70	\$0.00	\$59.15
08/01/2019	\$34.54	\$12.41	\$12.70	\$0.00	\$59.65
12/01/2019	\$34.54	\$12.41	\$13.72	\$0.00	\$60.67
06/01/2020	\$35.44	\$12.41	\$13.72	\$0.00	\$61.57
08/01/2020	\$35.44	\$12.91	\$13.72	\$0.00	\$62.07
12/01/2020	\$35.44	\$12.91	\$14.82	\$0.00	\$63.17
06/01/2021	\$36.24	\$12.91	\$14.82	\$0.00	\$63.97
08/01/2021	\$36.24	\$13.41	\$14.82	\$0.00	\$64.47
12/01/2021	\$36.24	\$13.41	\$16.01	\$0.00	\$65.66

**SPECIALIZED EARTH MOVING EQUIP > 35 TONS**

TEAMSTERS JOINT COUNCIL NO. 10 ZONE B

12/01/2018	\$33.83	\$11.91	\$12.70	\$0.00	\$58.44
06/01/2019	\$34.83	\$11.91	\$12.70	\$0.00	\$59.44
08/01/2019	\$34.83	\$12.41	\$12.70	\$0.00	\$59.94
12/01/2019	\$34.83	\$12.41	\$13.72	\$0.00	\$60.96
06/01/2020	\$35.73	\$12.41	\$13.72	\$0.00	\$61.86
08/01/2020	\$35.73	\$12.91	\$13.72	\$0.00	\$62.36
12/01/2020	\$35.73	\$12.91	\$14.82	\$0.00	\$63.46
06/01/2021	\$36.53	\$12.91	\$14.82	\$0.00	\$64.26
08/01/2021	\$36.53	\$13.41	\$14.82	\$0.00	\$64.76
12/01/2021	\$36.53	\$13.41	\$16.01	\$0.00	\$65.95

**SPRINKLER FITTER**

SPRINKLER FITTERS LOCAL 550 - (Section A) Zone 1

03/01/2019	\$58.98	\$9.47	\$19.60	\$0.00	\$88.05
10/01/2019	\$60.48	\$9.47	\$19.60	\$0.00	\$89.55
03/01/2020	\$61.98	\$9.47	\$19.60	\$0.00	\$91.05
10/01/2020	\$63.48	\$9.47	\$19.60	\$0.00	\$92.55
03/01/2021	\$64.98	\$9.47	\$19.60	\$0.00	\$94.05

**Classification**

**Effective Date   Base Wage   Health   Pension   Supplemental Unemployment   Total Rate**

**Apprentice - SPRINKLER FITTER - Local 550 (Section A) Zone 1**
**Effective Date - 03/01/2019**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	35	\$20.64	\$9.47	\$9.10	\$0.00	\$39.21
2	40	\$23.59	\$9.47	\$9.10	\$0.00	\$42.16
3	45	\$26.54	\$9.47	\$9.10	\$0.00	\$45.11
4	50	\$29.49	\$9.47	\$9.10	\$0.00	\$48.06
5	55	\$32.44	\$9.47	\$9.10	\$0.00	\$51.01
6	60	\$35.39	\$9.47	\$10.60	\$0.00	\$55.46
7	65	\$38.34	\$9.47	\$10.60	\$0.00	\$58.41
8	70	\$41.29	\$9.47	\$10.60	\$0.00	\$61.36
9	75	\$44.24	\$9.47	\$10.60	\$0.00	\$64.31
10	80	\$47.18	\$9.47	\$10.60	\$0.00	\$67.25

**Effective Date - 10/01/2019**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	35	\$21.17	\$9.47	\$9.10	\$0.00	\$39.74
2	40	\$24.19	\$9.47	\$9.10	\$0.00	\$42.76
3	45	\$27.22	\$9.47	\$9.10	\$0.00	\$45.79
4	50	\$30.24	\$9.47	\$9.10	\$0.00	\$48.81
5	55	\$33.26	\$9.47	\$9.10	\$0.00	\$51.83
6	60	\$36.29	\$9.47	\$10.60	\$0.00	\$56.36
7	65	\$39.31	\$9.47	\$10.60	\$0.00	\$59.38
8	70	\$42.34	\$9.47	\$10.60	\$0.00	\$62.41
9	75	\$45.36	\$9.47	\$10.60	\$0.00	\$65.43
10	80	\$48.38	\$9.47	\$10.60	\$0.00	\$68.45

Notes: Apprentice entered prior 9/30/10:  
40/45/50/55/60/65/70/75/80/85  
Steps are 850 hours

**Apprentice to Journeyworker Ratio:1:3**

STEAM BOILER OPERATOR	12/01/2018	\$47.10	\$11.50	\$15.60	\$0.00	\$74.20
OPERATING ENGINEERS LOCAL 4	06/01/2019	\$48.19	\$11.50	\$15.60	\$0.00	\$75.29
	12/01/2019	\$49.33	\$11.50	\$15.60	\$0.00	\$76.43
	06/01/2020	\$50.41	\$11.50	\$15.60	\$0.00	\$77.51
	12/01/2020	\$51.55	\$11.50	\$15.60	\$0.00	\$78.65
	06/01/2021	\$52.64	\$11.50	\$15.60	\$0.00	\$79.74
	12/01/2021	\$53.78	\$11.50	\$15.60	\$0.00	\$80.88

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
TAMPERS, SELF-PROPELLED OR TRACTOR DRAWN OPERATING ENGINEERS LOCAL 4	12/01/2018	\$47.10	\$11.50	\$15.60	\$0.00	\$74.20
	06/01/2019	\$48.19	\$11.50	\$15.60	\$0.00	\$75.29
	12/01/2019	\$49.33	\$11.50	\$15.60	\$0.00	\$76.43
	06/01/2020	\$50.41	\$11.50	\$15.60	\$0.00	\$77.51
	12/01/2020	\$51.55	\$11.50	\$15.60	\$0.00	\$78.65
	06/01/2021	\$52.64	\$11.50	\$15.60	\$0.00	\$79.74
	12/01/2021	\$53.78	\$11.50	\$15.60	\$0.00	\$80.88
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
TELECOMMUNICATION TECHNICIAN ELECTRICIANS LOCAL 103	03/01/2019	\$38.33	\$13.00	\$16.82	\$0.00	\$68.15

**Apprentice - TELECOMMUNICATION TECHNICIAN - Local 103**

**Effective Date - 03/01/2019**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	\$15.33	\$13.00	\$0.46	\$0.00	\$28.79
2	40	\$15.33	\$13.00	\$0.46	\$0.00	\$28.79
3	45	\$17.25	\$13.00	\$13.42	\$0.00	\$43.67
4	45	\$17.25	\$13.00	\$13.42	\$0.00	\$43.67
5	50	\$19.17	\$13.00	\$13.73	\$0.00	\$45.90
6	55	\$21.08	\$13.00	\$14.03	\$0.00	\$48.11
7	60	\$23.00	\$13.00	\$14.34	\$0.00	\$50.34
8	65	\$24.91	\$13.00	\$14.66	\$0.00	\$52.57
9	70	\$26.83	\$13.00	\$14.96	\$0.00	\$54.79
10	75	\$28.75	\$13.00	\$15.27	\$0.00	\$57.02

Notes:

Apprentice to Journeyworker Ratio:1:1

TERRAZZO FINISHERS BRICKLAYERS LOCAL 3 - MARBLE & TILE	02/01/2019	\$52.49	\$10.75	\$20.66	\$0.00	\$83.90
	08/01/2019	\$53.84	\$10.75	\$20.80	\$0.00	\$85.39
	02/01/2020	\$54.48	\$10.75	\$20.80	\$0.00	\$86.03
	08/01/2020	\$55.83	\$10.75	\$20.95	\$0.00	\$87.53
	02/01/2021	\$56.47	\$10.75	\$20.95	\$0.00	\$88.17
	08/01/2021	\$57.87	\$10.75	\$21.11	\$0.00	\$89.73
	02/01/2022	\$58.46	\$10.75	\$21.11	\$0.00	\$90.32

**Classification**

Effective Date    Base Wage    Health    Pension    Supplemental  
Unemployment    Total Rate

**Apprentice - TERRAZZO FINISHER - Local 3 Marble & Tile**
**Effective Date - 02/01/2019**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$26.25	\$10.75	\$20.03	\$0.00	\$57.03
2	60	\$31.49	\$10.75	\$20.03	\$0.00	\$62.27
3	70	\$36.74	\$10.75	\$20.03	\$0.00	\$67.52
4	80	\$41.99	\$10.75	\$20.03	\$0.00	\$72.77
5	90	\$47.24	\$10.75	\$20.03	\$0.00	\$78.02

**Effective Date - 08/01/2019**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$26.92	\$10.75	\$20.80	\$0.00	\$58.47
2	60	\$32.30	\$10.75	\$20.80	\$0.00	\$63.85
3	70	\$37.69	\$10.75	\$20.80	\$0.00	\$69.24
4	80	\$43.07	\$10.75	\$20.80	\$0.00	\$74.62
5	90	\$48.46	\$10.75	\$20.80	\$0.00	\$80.01

**Notes:**
**Apprentice to Journeyworker Ratio:1:3**

TEST BORING DRILLER <i>LABORERS - FOUNDATION AND MARINE</i>	12/01/2018	\$40.00	\$7.85	\$15.55	\$0.00	\$63.40
	06/01/2019	\$41.00	\$7.85	\$15.55	\$0.00	\$64.40
	12/01/2019	\$42.00	\$7.85	\$15.55	\$0.00	\$65.40
	06/01/2020	\$42.99	\$7.85	\$15.55	\$0.00	\$66.39
	12/01/2020	\$43.97	\$7.85	\$15.55	\$0.00	\$67.37
	06/01/2021	\$44.99	\$7.85	\$15.55	\$0.00	\$68.39
	12/01/2021	\$46.00	\$7.85	\$15.55	\$0.00	\$69.40
For apprentice rates see "Apprentice- LABORER"						
TEST BORING DRILLER HELPER <i>LABORERS - FOUNDATION AND MARINE</i>	12/01/2018	\$38.72	\$7.85	\$15.55	\$0.00	\$62.12
	06/01/2019	\$39.72	\$7.85	\$15.55	\$0.00	\$63.12
	12/01/2019	\$40.72	\$7.85	\$15.55	\$0.00	\$64.12
	06/01/2020	\$41.71	\$7.85	\$15.55	\$0.00	\$65.11
	12/01/2020	\$42.69	\$7.85	\$15.55	\$0.00	\$66.09
	06/01/2021	\$43.71	\$7.85	\$15.55	\$0.00	\$67.11
	12/01/2021	\$44.72	\$7.85	\$15.55	\$0.00	\$68.12
For apprentice rates see "Apprentice- LABORER"						
TEST BORING LABORER <i>LABORERS - FOUNDATION AND MARINE</i>	12/01/2018	\$38.60	\$7.85	\$15.55	\$0.00	\$62.00
	06/01/2019	\$39.60	\$7.85	\$15.55	\$0.00	\$63.00
	12/01/2019	\$40.60	\$7.85	\$15.55	\$0.00	\$64.00
	06/01/2020	\$41.59	\$7.85	\$15.55	\$0.00	\$64.99
	12/01/2020	\$42.57	\$7.85	\$15.55	\$0.00	\$65.97
	06/01/2021	\$43.59	\$7.85	\$15.55	\$0.00	\$66.99
	12/01/2021	\$44.60	\$7.85	\$15.55	\$0.00	\$68.00
For apprentice rates see "Apprentice- LABORER"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
TRACTORS/PORTABLE STEAM GENERATORS <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2018	\$47.10	\$11.50	\$15.60	\$0.00	\$74.20
	06/01/2019	\$48.19	\$11.50	\$15.60	\$0.00	\$75.29
	12/01/2019	\$49.33	\$11.50	\$15.60	\$0.00	\$76.43
	06/01/2020	\$50.41	\$11.50	\$15.60	\$0.00	\$77.51
	12/01/2020	\$51.55	\$11.50	\$15.60	\$0.00	\$78.65
	06/01/2021	\$52.64	\$11.50	\$15.60	\$0.00	\$79.74
	12/01/2021	\$53.78	\$11.50	\$15.60	\$0.00	\$80.88
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
TRAILERS FOR EARTH MOVING EQUIPMENT <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE B</i>	12/01/2018	\$34.12	\$11.91	\$12.70	\$0.00	\$58.73
	06/01/2019	\$35.12	\$11.91	\$12.70	\$0.00	\$59.73
	08/01/2019	\$35.12	\$12.41	\$12.70	\$0.00	\$60.23
	12/01/2019	\$35.12	\$12.41	\$13.72	\$0.00	\$61.25
	06/01/2020	\$36.02	\$12.41	\$13.72	\$0.00	\$62.15
	08/01/2020	\$36.02	\$12.91	\$13.72	\$0.00	\$62.65
	12/01/2020	\$36.02	\$12.91	\$14.82	\$0.00	\$63.75
	06/01/2021	\$36.82	\$12.91	\$14.82	\$0.00	\$64.55
	08/01/2021	\$36.82	\$13.41	\$14.82	\$0.00	\$65.05
	12/01/2021	\$36.82	\$13.41	\$16.01	\$0.00	\$66.24
TUNNEL WORK - COMPRESSED AIR <i>LABORERS (COMPRESSED AIR)</i>	12/01/2018	\$50.88	\$7.85	\$15.95	\$0.00	\$74.68
	06/01/2019	\$51.88	\$7.85	\$15.95	\$0.00	\$75.68
	12/01/2019	\$52.88	\$7.85	\$15.95	\$0.00	\$76.68
	06/01/2020	\$53.87	\$7.85	\$15.95	\$0.00	\$77.67
	12/01/2020	\$54.85	\$7.85	\$15.95	\$0.00	\$78.65
	06/01/2021	\$55.87	\$7.85	\$15.95	\$0.00	\$79.67
	12/01/2021	\$56.88	\$7.85	\$15.95	\$0.00	\$80.68
For apprentice rates see "Apprentice- LABORER"						
TUNNEL WORK - COMPRESSED AIR (HAZ. WASTE) <i>LABORERS (COMPRESSED AIR)</i>	12/01/2018	\$52.88	\$7.85	\$15.95	\$0.00	\$76.68
	06/01/2019	\$53.88	\$7.85	\$15.95	\$0.00	\$77.68
	12/01/2019	\$54.88	\$7.85	\$15.95	\$0.00	\$78.68
	06/01/2020	\$55.87	\$7.85	\$15.95	\$0.00	\$79.67
	12/01/2020	\$56.85	\$7.85	\$15.95	\$0.00	\$80.65
	06/01/2021	\$57.87	\$7.85	\$15.95	\$0.00	\$81.67
	12/01/2021	\$58.88	\$7.85	\$15.95	\$0.00	\$82.68
For apprentice rates see "Apprentice- LABORER"						
TUNNEL WORK - FREE AIR <i>LABORERS (FREE AIR TUNNEL)</i>	12/01/2018	\$42.95	\$7.85	\$15.95	\$0.00	\$66.75
	06/01/2019	\$43.95	\$7.85	\$15.95	\$0.00	\$67.75
	12/01/2019	\$44.95	\$7.85	\$15.95	\$0.00	\$68.75
	06/01/2020	\$45.94	\$7.85	\$15.95	\$0.00	\$69.74
	12/01/2020	\$46.92	\$7.85	\$15.95	\$0.00	\$70.72
	06/01/2021	\$47.94	\$7.85	\$15.95	\$0.00	\$71.74
	12/01/2021	\$48.95	\$7.85	\$15.95	\$0.00	\$72.75
For apprentice rates see "Apprentice- LABORER"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
<b>TUNNEL WORK - FREE AIR (HAZ. WASTE)</b> <i>LABORERS (FREE AIR TUNNEL)</i>	12/01/2018	\$44.95	\$7.85	\$15.95	\$0.00	\$68.75
	06/01/2019	\$45.95	\$7.85	\$15.95	\$0.00	\$69.75
	12/01/2019	\$46.95	\$7.85	\$15.95	\$0.00	\$70.75
	06/01/2020	\$47.94	\$7.85	\$15.95	\$0.00	\$71.74
	12/01/2020	\$48.92	\$7.85	\$15.95	\$0.00	\$72.72
	06/01/2021	\$49.94	\$7.85	\$15.95	\$0.00	\$73.74
	12/01/2021	\$50.95	\$7.85	\$15.95	\$0.00	\$74.75
For apprentice rates see "Apprentice- LABORER"						
<b>VAC-HAUL</b> <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE B</i>	12/01/2018	\$33.54	\$11.91	\$12.70	\$0.00	\$58.15
	06/01/2019	\$34.54	\$11.91	\$12.70	\$0.00	\$59.15
	08/01/2019	\$34.54	\$12.41	\$12.70	\$0.00	\$59.65
	12/01/2019	\$34.54	\$12.41	\$13.72	\$0.00	\$60.67
	06/01/2020	\$35.44	\$12.41	\$13.72	\$0.00	\$61.57
	08/01/2020	\$35.44	\$12.91	\$13.72	\$0.00	\$62.07
	12/01/2020	\$35.44	\$12.91	\$14.82	\$0.00	\$63.17
	06/01/2021	\$36.24	\$12.91	\$14.82	\$0.00	\$63.97
	08/01/2021	\$36.24	\$13.41	\$14.82	\$0.00	\$64.47
	12/01/2021	\$36.24	\$13.41	\$16.01	\$0.00	\$65.66
<b>WAGON DRILL OPERATOR</b> <i>LABORERS - ZONE 2</i>	12/01/2018	\$33.77	\$7.85	\$14.44	\$0.00	\$56.06
	06/01/2019	\$34.64	\$7.85	\$14.44	\$0.00	\$56.93
	12/01/2019	\$35.50	\$7.85	\$14.44	\$0.00	\$57.79
	06/01/2020	\$36.39	\$7.85	\$14.44	\$0.00	\$58.68
	12/01/2020	\$37.28	\$7.85	\$14.44	\$0.00	\$59.57
	06/01/2021	\$38.20	\$7.85	\$14.44	\$0.00	\$60.49
	12/01/2021	\$39.11	\$7.85	\$14.44	\$0.00	\$61.40
For apprentice rates see "Apprentice- LABORER"						
<b>WASTE WATER PUMP OPERATOR</b> <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2018	\$47.58	\$11.50	\$15.60	\$0.00	\$74.68
	06/01/2019	\$48.68	\$11.50	\$15.60	\$0.00	\$75.78
	12/01/2019	\$49.83	\$11.50	\$15.60	\$0.00	\$76.93
	06/01/2020	\$50.93	\$11.50	\$15.60	\$0.00	\$78.03
	12/01/2020	\$52.08	\$11.50	\$15.60	\$0.00	\$79.18
	06/01/2021	\$53.18	\$11.50	\$15.60	\$0.00	\$80.28
	12/01/2021	\$54.33	\$11.50	\$15.60	\$0.00	\$81.43
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
<b>WATER METER INSTALLER</b> <i>PLUMBERS &amp; GASFITTERS LOCAL 12</i>	03/01/2019	\$56.69	\$11.82	\$16.51	\$0.00	\$85.02
	09/01/2019	\$58.19	\$11.82	\$16.51	\$0.00	\$86.52
	03/01/2020	\$59.69	\$11.82	\$16.51	\$0.00	\$88.02
	09/01/2020	\$61.19	\$11.82	\$16.51	\$0.00	\$89.52
	03/01/2021	\$62.69	\$11.82	\$16.51	\$0.00	\$91.02
For apprentice rates see "Apprentice- PLUMBER/PIPEFITTER" or "PLUMBER/GASFITTER"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
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Additional Apprentice Information:

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.

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## SECTION 01010

### SUMMARY OF THE WORK

#### PART 1 - GENERAL

##### 1.1 DESCRIPTION

A. Work included:

1. The Work of this Contract is located in the Town of Natick, MA, at locations on East Central Street, Bacon Street, Town Forest Water Storage Tank Transmission Main, Worcester Street (Route 9) and North Main Street (Route 27).
2. The Work on East Central Street includes the abandonment of a six-inch (6") diameter cast iron water main and connection of water services to the existing 10-inch diameter cast iron water main. Work also includes cleaning and lining approximately 3,100 linear feet of 10-inch diameter water main under the base Contract, prior to connecting services from the 6-inch water main.
  - a. East Central water service work also includes installation of a two-inch (2") diameter PVC sleeve under East Central as a sleeve for the new water services.
  - b. Work also includes installation, maintenance and removal of temporary water mains as required by the cleaning and lining process.
  - c. Work also includes the abandonment of a six-inch (6") diameter water main, including removal of gate box tops, filling with gravel and pavement.
  - d. Work also includes furnish and installing hydrant branches where shown on the Contract Documents.
  - e. Work will require excavation under stone walls to install new water service from existing water service. This may require removing and replacing wall to existing condition if it is a dry wall.
  - f. All roadway trenches and driveway trenches to be backfilled with flowable fill.
  - g. Pavement restoration consists of permanent pit and trench paving. See specifications and drawings for required depths and type.
  - h. Contractor shall also furnish hydrants, delivered to the Owner's Department of Public Works building for future use.
3. The Work at Bacon Street intersection with Town Forest water tank access Road, and Town Forest tank includes installation of twelve-inch diameter water main connections in two locations to the existing water mains. One is located on Bacon Street and the other is located near the water tank.
  - a. Work includes fittings, gate valves and pipe installation to provide for future extension of the water main.

4. The Work on North Main Street (Route 27) and Worcester Street (Route 9) includes the replacement of a six-inch (6") diameter cast iron water main with a new eight-inch (8") diameter ductile iron water main. The total length of six-inch (6") diameter main replacement is approximately eight hundred and twenty (820) linear feet.
  - a. Work also includes installation and maintenance and removal of temporary water piping as required by the new water main installation.
  - b. Work also includes cleaning and lining approximately one thousand six hundred and eighty (1,680) linear feet of 8-inch diameter cast iron water main.
  - c. Work is covered under a MassDOT permit for work in a state roadway. See permit in the appendix for additional details. The MassDOT permit includes limitations on work items if construction vehicles are in the paved roadway.
5. The additional work, if authorized on East Central (Wellesley) and Bacon Street includes cleaning and lining approximately 2,500 linear feet of 10-inch diameter water main in East Central and Bacon Street under Additional Items.
  1. Work includes temporary water piping, cleaning and lining 10" water pipe and pit piping.
  2. Pits in Rt 135 to be backfilled with flowable fill.
6. Traffic Management Plan
  1. A majority of the work is located within high volume vehicle traveled roadways, Route 135 (East Central Street), Route 9 (Worcester Road) and Route 27 (North Main Street). In addition, sections of the work in North Main Street is within a section of the MassHighway system.
  2. Included in with the specifications and drawings are minimum requirements for traffic control devices, with assumptions as to how the work will be completed. Actual work logistics completed by the Contractor that may require alternative signage as required by the Owner, Police Departmental the MassDOT shall be implemented by the Contractor.

END OF SECTION

## SECTION 01015

### PRICE ADJUSTMENTS FOR SPECIFIC MATERIALS

#### PART 1 - GENERAL

##### 1.1 DESCRIPTION

- A. In accordance with the requirements of Chapter 30, Section 38A of the General Laws of Massachusetts municipal contracts for water and sewer projects bid under Chapter 30 Section 39M shall include a price adjustment clause for each of the following: fuel, both diesel and gasoline; liquid asphalt; and Portland cement contained in cast-in-place concrete.
1. Payment or Credit shall be applied to the monthly Application for Partial Payment and Application for Final Payment.
  2. Compliance with this provision is required; there is no "opting-in" or "opting-out"
  3. Price adjustments will only be made if the variance is 5% or more. A variance can result in the Period Price being either higher or lower than the Contractor's Price. Once a 5% difference has been reached, the adjustment will apply.
  4. No adjustment will be paid for work done beyond the extended completion date of any contract unless the Awarding Authority has approved an extension of Contract Time for the Contract.
  5. Should the Contractor fail to submit delivery documentation as specified in this section, the Owner may calculate the price adjustment using alternative methods and include a credit for the Owners additional expense of estimating these values.
- B. This Contract is subject to Price Adjustments based on cost increases and cost decreases for diesel fuel per gallon and gasoline is per gallon. **Price Adjustments** shall be based on monthly price listings as provided by AAA's Daily Fuel Gauge Report <http://fuelgaugereport.aaa.com>, Massachusetts Average, for diesel fuel and regular grade gasoline.
- C. This Contract is subject to Price Adjustments based on cost increases and cost decreases for liquid asphalt, per ton. **Price Adjustments** shall be based on monthly price listings as provided by ENR Engineering News Record, Construction Economics [http://enr.construction.com/economics/current\\_costs](http://enr.construction.com/economics/current_costs), Material Price Index, Boston, for Asphalt, Paving PG58
- D. This Contract is subject to Price Adjustments based on cost increases and cost decreases for Portland cement, per ton. **Price Adjustments** shall be based on monthly price listings as provided by ENR Engineering News Record, Construction Economics [http://enr.construction.com/economics/current\\_costs](http://enr.construction.com/economics/current_costs), Material Price Index, Boston for Portland cement.

## 1.2 SPECIAL PROVISIONS

- A. **MONTHLY PRICE ADJUSTMENT FOR DIESEL FUEL AND GASOLINE:** This adjustment will provide for either additional compensation to the Contractor or repayment to the Owner, depending on an increase or decrease in the average price of diesel or gasoline. This adjustment will be based on actual on-site fuel utilized during the Contract.
1. Base Price: Base Price of diesel fuel is \$3.044 and regular unleaded gasoline is \$2.439 shall be utilizing the AAA Daily Fuel Gauge Report web site, which includes State Tax.
  2. Period Price: Period Price will be the prices listed on AAA website on the first business day of a given month.
  3. Total Gallons will be the actual substantiated monthly quantity of fuel used for on-site equipment during the work period from start through the extended time of completion date, reported on a monthly basis.
  4. The Price Adjustment will be determined by calculating the price difference between the Base Price (remains constant) and the Period Price (varies monthly), and if that increase or decrease is greater than 5% for that period, the gallons verified for on-site use that period multiplied by the cost difference between the Base Price and the Period Price for that period.
  5. It shall be the Contractor's responsibility to provide a summary with backup receipts at the end of each month, which are to include date of purchase, gallons of fuel, type of fuel and company from which the fuel was purchased.

### Example Calculation – Diesel Fuel

Base Price <u>AAA</u>	Period Price <u>AAA</u>	Difference <u>Per Gallon</u>	% Change <u>+ Or -</u>	Change <u>≥ 5%</u>
\$3.50	\$3.75	+ \$0.25	7%	Yes

### Contractor's Substantiated Monthly Adjustment

Total Gallons	Difference Per Gallon	Price Adjustment
1000	+ \$0.25	+ \$250.00

- B. **MONTHLY PRICE ADJUSTMENT FOR ASPHALT CEMENT:** The Price Adjustment applies only to the actual virgin liquid asphalt content in the mixture placed on the project.
1. Base Price: Base Price of liquid asphalt is \$422.48 per ton utilizing the ENR Material Price Index.
  2. Period Price: Period Price of liquid asphalt will be referenced to the first report of the month listed on the ENR website for a given month.
  3. Total Tons will be derived from the actual substantiated tonnage slips for the month(s) material is delivered.

4. The Price Adjustment will be determined by multiplying the price difference between the Base Price (remains constant) and the Period Price (varies monthly) times the number of tons of asphaltic paving placed during each monthly period times the percentage of liquid asphalt content. The calculations will use the midpoint of the specified content range for liquid asphalt (bitumen) content specified by the contract documents for the material delivered.
5. It shall be the Contractor's responsibility to provide a summary with backup tonnage slips at the end of each month, which are to include date of purchase, type of asphaltic paving and company from which the mixture was purchased.

Example Calculation – Asphalt Cement

<u>Base Price</u> <u>ENR</u>	<u>Period Price</u> <u>ENR</u>	<u>Difference</u> <u>Per Ton</u>	<u>% Change</u> <u>+ Or -</u>	<u>Change</u> <u>&gt; 5%</u>
\$415.71	\$392.18	- \$23.53	5.6%	Yes

Contractor's Substantiated Monthly Adjustment

1000 tons of binder course mix at 4.5 to 5.5% liquid asphalt (bitumen) content

<u>Total</u> <u>Tons</u> <u>Mix</u>	<u>Asphalt</u> <u>Content</u> <u>%</u>	<u>Total</u> <u>Tons</u> <u>Asphalt</u>	<u>Difference</u> <u>Per Ton</u>	<u>Price</u> <u>Adjustment</u>
1000	5%	50	- \$23.53	- \$1,176.50

- C. MONTHLY PRICE ADJUSTMENT FOR PORTLAND CEMENT: The Price Adjustment applies only to the actual Portland cement content in the mixture placed on the project.
1. Base Price: Base Price of Portland cement is \$125.86 per ton utilizing the ENR Material Price Index.
  2. Period Price: Period Price of Portland cement will be referenced to the first report of the month on the ENR website for a given month.
  3. Total Tons will be derived from the actual substantiated cubic yardage or tonnage slips for the month(s) material is delivered.
  4. The Price Adjustment will be a separate payment item and will be determined by multiplying the price difference between the Base Price (remains constant) and the Period Price (varies monthly) times the number of cubic yards of concrete mix delivered during each monthly period times the Portland cement content in tons per cubic yard. The calculations will use the minimum Portland cement content specified by the contract documents for the material delivered.
  5. It shall be the Contractor's responsibility to provide a summary with backup delivery slips at the end of each month, which are to include date of purchase, type of concrete mix and company from which the concrete was purchased. Site mixed concrete shall be based upon the weight of the dry product delivered and used, adjusted to Portland cement content if necessary.

Example Calculation – Portland Cement

<u>Base Price</u> <u>ENR</u>	<u>Period Price</u> <u>ENR</u>	<u>Difference</u> <u>Per Ton</u>	<u>% Change</u> <u>+ Or -</u>	<u>Change</u> <u>&gt; 5%</u>
\$95.50	\$110.00	+ \$14.50	15.2%	Yes

Contractor's Substantiated Monthly Adjustment

100 cubic yards of Class A concrete mix at 0.26 tons (520 pounds) of Portland cement per cubic yard

<u>Total</u> <u>Mix</u> <u>CY</u>	<u>Cement</u> <u>Content</u> <u>tons/CY</u>	<u>Total</u> <u>Tons</u> <u>Cement</u>	<u>Difference</u> <u>Per Ton</u>	<u>Price</u> <u>Adjustment</u>
100	.26	26	+ \$14.50	+ \$377

END OF SECTION

## SECTION 01025

### MEASUREMENT AND PAYMENT

#### PART 1 - GENERAL

##### 1.01 DESCRIPTION

- A. Purpose: The purpose of this section is to define the method of measurement and payment for each of the unit prices or lump sums listed in the Bid.
  - 1. The Contractor shall thoroughly review the work required for each payment item.
  - 2. The Contractor shall have included in his various bid items an amount to cover costs for additional work which may be necessary to construct in close proximity to Underground Facilities, services, poles, and other facilities which may exist. The discovery of an Underground Facility not shown on Contract Drawings during construction shall not constitute automatic initiation of a Change Order, and the additional work required to cross or pass this Underground Facility must be substantial, in the opinion of the Owner/Engineer for consideration for additional payment.
- B. Related Work:
  - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 thru Division 3 of these Specifications.

##### 1.02 PAYMENT LIMITS

- A. Linear Trench Payment Limits

The measurements for trench payment limits shall be used for the volume of material used to refill trenches, computing excavation below grade, and pavement quantities.

  - 1. Classification of Excavation:
    - i. All excavation will be classified as either earth or rock. Rock excavation shall be igneous, sedimentary, metamorphic, and conglomerate rock, which must be drilled and blasted, broken, or ripped by an excavator, boulders one (1) cubic yard or more in volume, as defined in 02227, and concrete masonry or stone masonry. All other materials encountered in the excavations will be classified as earth.
  - 2. Lines of Excavation:
    - i. All excavation shall be made in such a manner and to such widths as will give ample room for properly installing, building and inspecting pipelines and structures they are to contain.
    - ii. The width of trenches shall be sufficient to allow thorough compacting of the refill adjacent to the lower quarters of the pipe or structures. At pipe joints, such additional width and depth shall be excavated as necessary to give ample room for properly making and inspecting the pipe joints. Trench

- width at the level of the top of the pipe shall be kept as narrow as practicable for the proper execution of pipe laying and backfill.
- iii. Trench width payment limits in earth and rock trenches containing one pipe shall be measured within vertical lines, to the actual width excavated, but shall not exceed a width of four (4) feet for 6" diameter pipe and five (5') feet for 8" diameter and larger pipe. Boulders excavated within the width limits for rock trenches will be paid for at the total volume removed, under the Rock and Boulder Removal item, but only if larger than 1 cubic yard.
  - iv. The above specified trench limits shall be used for computing the volume of the purchased material if necessary, to refill trenches from grade to the bottom of roadway sub-base material including below grade excavation and refill, and shall be referred to as "excavation and refill payment limits" hereinafter in this Contract. Any excavation or refilling beyond these limits made necessary by the Contractor's method of construction shall not be eligible for payment. If additional width beyond above specified limits, or below grade excavation is ordered by the Engineer, the width ordered will be considered for payment, as will the refill material.
  - v. Earth excavation for pipeline trenches from the existing ground surface to grade shall not be paid for separately, and all costs for this excavation shall be included in the unit prices paid for the various pipe items.
  - vi. The maximum payment width limits for gravel sub-base in the trench area shall be as follows:

GRAVEL SUB-BASE LIMITS		
<u>PIPE DEPTH</u>	<u>6"and Smaller Pipe</u>	<u>8",10" &amp; 12" Pipe</u>
	<u>WIDTH LIMITS</u>	<u>WIDTH LIMITS</u>
0-8 feet	5.5 feet	6.5 feet
8-12 feet	6.5 feet	7.5 feet
> 12 feet	7.5 feet	8.5 feet

**B. Miscellaneous Piping Pits and Additional Excavation and test pits**

1. It is the intent of this Contract that all costs associated with trench excavation and refill with excavated material within the normal trench limits for miscellaneous piping pits is to be included under the miscellaneous piping pits item. Excavation and refill beyond these limits ordered by the Owner or necessary due to movement or alteration of an excavated pit, or for fitting or valve replacement within an insertion pit that requires the pit to be enlarged beyond 130% of the payment limits for pits will be considered for payment under the Additional Excavation and Test Pits item. Excavation and refill beyond these limits due to the Contractor's methods of operation will not be considered for payment.
  - a. Satisfactory trench excavated materials, unless otherwise restricted, meeting the classification of Ordinary or Select Borrow shall be utilized as trench refill material, and the costs for handling and placing this material shall be included in the appropriate pit or additional excavation item .

- b. The maximum payment limits for a miscellaneous piping pit shall be the actual width, length and depth as measured in the field. Payment will not exceed the maximum limits of 9-feet in length, 7-feet in width, and 7-feet in depth (1.0-foot below pipe). Excavation beyond these limits due to Contractor's convenience will be at no additional cost to the Owner. If pipe depth dictates a trench depth greater than 7-feet, payment for additional approved excavation will be compensated under Additional Excavation and Test Pits item. If pit has to be expanded, as approved by Owner/Engineer, and the pit exceeds the maximum pit size, the additional excavation will be paid under the additional excavation item.
- c. All costs for furnishing, installing, and removing sheeting bracing or the use of a steel supported box shall be included in this item.
- d. Pavement Limits – It is the intent of this Contract to minimize the insertion pit and miscellaneous pit excavation size, and all payment associated with resurfacing will be based on actual size up to a maximum measurement of 9-feet in length and 7-feet in width. Pavement limits shall not be exceeded unless the Contractor is required to cut edges of trench back due to cracked pavement.

C. Pavement Payment Limits – Linear Trench

1. Payment to be measured as written under the appropriate pavement item.
  - i. A 5% service factor shall be allowed if a comparison between measurements and delivery slips indicate that additional material was placed. If a comparison between delivery slips and measurements indicate less material was placed, the slip quantity shall be used for payment. The Contractor shall submit to the Engineer one (1) copy of the certified weight delivery slips for all asphaltic concrete used in the Work.
2. The maximum payment width limits for pavement resurfacing within existing roadway shall be as follows:

<u>PIPE DEPTH</u>	<u>TEMPORARY WIDTH LIMITS</u>	<u>PERMANENT WIDTH LIMITS</u>
0-8 feet	6.5 feet	8.5 feet
8-12 feet	7.5 feet	9.5 feet
> 12 feet	8.5 feet	10.5 feet

3. Width exception: If trench pavement limits are reached and the remaining existing pavement width on either side of trench is less than 3 feet, then the pavement width limit will be extended to the edge of the existing road pavement for each side meeting this exception. All costs for removing remaining pavement shall be included under the trench base pavement item.

### 1.03 SURPLUS MATERIAL

- A. All costs for stockpiling, loading, hauling and disposing of surplus material shall be included in the pits and additional excavation items.

#### 1.04 DEWATERING

- A. All costs for furnishing, installing and operating a water pipe and groundwater (if present) dewatering system shall be included in the miscellaneous pit and cleaning and lining items.

#### 1.05 UNIFORMED POLICE OFFICERS

- A. Uniformed Police Officers are required for protection of persons or property; the Contractor shall be responsible for making of all arrangements and scheduling in relation thereto. The Police Department shall bill the Water Department directly on a weekly basis, and the Water Department shall pay the amounts due.
- B. If the Contractor fails to cancel a police detail in a timely manner as stipulated by the police department, the contractor shall be responsible for paying that detail cost.

#### 1.06 MEASUREMENT OF QUANTITIES

- A. The quantities of the various items of work performed shall be determined, for purposes of progress and final payment, by the Contractor and the Engineer.

The method of measurements to be used in the determination of quantities of the Work of this Contract shall be as specified in this Section.

1. Area Measurements
  - i. Unless otherwise specified, measurement, for area computations shall be made along the surface and taken to the nearest half (1/2) foot.
2. Linear Foot Measurements
  - i. Measurement for length for all items, such as pipe cleaning, lining and television inspection will be along the horizontal centerline of the pipe, with no deductions for valves or fittings. Measurement will be to the nearest tenth of a foot.
3. Volume Measurements: In figuring volumes of excavation the following shall apply:
  - i. Excavation Below Grade: Measurements shall be taken to the lines and grades actually excavated as ordered by the Engineer.
  - ii. Test Pits: Measurements shall be taken to the lines and grades actually excavated, as directed by the Engineer.
  - iii. Process Gravel, Ordinary and Select Borrow: Volumes shall be calculated from certified weight slips. Conversion factor of weight to volume, of the materials shall be: Gravel - 2800 lbs = 1 c.y.
4. Lump Sum: the term "lump sum", when used as a unit of payment, shall mean complete payment for the work described in the Contract Documents.

5. Ton: When used as a pavement payment item, shall be arrived at by the following method:
  - i. Payment shall be calculated by measurements of the surface area, within the payment limits, by square yards, times the depth of pavement, times a factor of .060 for a conversion to ton basis.
  - ii. A five (5) percent service factor over the measurement amount shall be allowed if a comparison between measurements and delivery slips indicate that additional material was placed. If delivery slips indicate less material placed than the measurements indicates, the slip quantity shall be used for payment. The Contractor shall submit to the Engineer, one (1) copy of the certified weight delivery slips for all asphaltic concrete used in the Work.

## 1.07 PAYMENT ITEMS

### Base Contract Payment Item Number

### Description

1.	Mobilization
2	Excavation Below Grade
3.	Test Pits
4.	Rock and Boulder Removal
5.	Process Gravel
6.	Ordinary Borrow
7.	Select Borrow
8.	Concrete Sidewalk
9.	Temporary Trench Paving
10.	Permanent Pit Paving
11.	Permanent Trench Resurfacing
12.	Full Width Overlay Rt 135
13.	Dust Control
14.	Milling Rt 135
15.	Granite Curb
16.	Bituminous Sidewalk
17.	Loam and Seed
18.	6 and 8-Inch Gate Valves
19.	10 and 12-Inch Gate Valves
20.	Solid Sleeves
21.	Fittings
22.	Temporary Water Service Rt 9, 27 & 135
23.	Water Services Rt 135
24.	Water Services
25.	Service Valves
26.	Hydrant Assemblies
27.	Furnishing Hydrants
28.	Pit Pipe 6-12"
29.	Miscellaneous Pits
30.	Environmental Controls

31.	Bacon St. & Town Forest Connection
32.	Rt 9 Water Main Replacement
33.	Rt 9, 8" & 6" Cleaning and Lining
34.	Rt 9, 12" Cleaning and Lining
35.	East Central 10" Cleaning and Lining
36.	Pit Flowable Fill
37.	Drain Replacement
38.	Electronic Message Boards
39.	Line Painting
40.	Traffic Management, Rt 9 & 27
41.	Traffic Management, East Central & Town Forest

#### Add Item Payment

<u>Item Number</u>	<u>Description</u>
A1.	10" Gate Valves
A2.	Solid Sleeves
A3.	Fittings
A4.	Temporary Water Main
A5.	Pit Pipe 10" & 6"
A6.	Miscellaneous Pits
A7.	Bacon & East Central Cleaning and Lining
A8.	Temporary and Permanent Pit Resurfacing

### 1.08 (ITEM 1) MOBILIZATION

#### A. Measurement

1. Measurement of Mobilization costs shall be on a lump sum basis with 80% at time of start of work upon providing bonds and insurance permits, approval of submittals, and for satisfactory completion of the set up at the site and storage yard, including transportation of materials and equipment, 15% at mid-point of construction upon satisfactory completion of maintenance program, and the final 5% upon satisfactory completion of the storage yard cleanup and removal of equipment.

#### B. Payment

1. Payment for Mobilization shall be made at the lump sum price under Item No. 1 in the Agreement. The price shall be full compensation for all costs associated with Mobilization including but not limited to bonds and insurance, Contractor administration, transportation of equipment and materials to the construction site, if necessary, paying all costs associated with obtaining land for storage yard, obtaining of all permits, set up of storage yard, maintenance of same, and removal of equipment and materials upon completion of work.
2. It is the Contractor's responsibility for obtaining and maintaining a storage and staging area at no additional cost.
3. The total bid price for Mobilization shall not exceed 5% of the total remaining bid items.

## 1.09 (ITEM 2) EXCAVATION BELOW GRADE

### A. Measurement

1. Measurement of Excavation Below Grade shall be taken to the lines and grades actually excavated or as ordered, and within the trench width limits specified in this Section. If the trench bottom is excavated below normal grade through error by the Contractor, or if improper dewatering disturbs the sub-grade and additional excavation in the trench is required, such removal and replacement of material will not be measured for payment.

### B. Payment

1. Payment for Excavation Below Grade shall be made at the unit price per cubic yard under Item No. 2 in the Agreement. The price shall be full compensation for all costs associated with Excavation Below Grade, including but not limited to labor and equipment to complete the work, excavation, shoring, bracing, plating, dewatering, removal and disposal of unsuitable material, and replacement and compaction of the refill material. Refill material, if purchased, shall be payable under the ordinary borrow item.
2. This item shall apply if unsuitable or soft bottom is found at pipe grade and not through the fault of the Contractor. It is agreed that such unsuitable foundation material is recognized as characteristic in the type of construction under this Contract and that the unit prices for Excavation Below Grade fulfill the applicable requirements of Section 39N of Chapter 30 of the Massachusetts General Laws (Ter. Edition) and will be used for reimbursement to the Contractor for such excavation.

## 1.10 (ITEM 3) TEST PITS

### A. Measurement

1. Measurement for Test Pits shall be taken to the lines and grades actually excavated, as directed by the Engineer.

### B. Payment

1. Payment for Test Pits shall be made at the unit price per cubic yard under Item No. 3 in the Agreement. The price shall be full compensation for all costs associated with Test Pits, including but not limited to test pit excavation by machine or hand, pavement cutting, dewatering, shoring, plating, backfilling and compaction of backfill, disposal of unsuitable material, as specified herein or reasonably implied. In general, the width of the test pit shall be kept at a minimum width.
2. Payment for Test Pits shall be only as directed by the Owner or Engineer for locations of existing utilities.

## 1.11 (ITEM 4) ROCK AND BOULDER REMOVAL

### A. Measurement

1. Rocks and Boulders encountered within the trench which can be removed and

disposed of without the use of explosives shall be removed and measured on the surface in three dimensions to determine volume.

B. Payment

1. Payment for Rock and Boulder Removal shall be made at the unit price per cubic yard under Item No. 4 in the Agreement. The price shall be full compensation for all costs associated with Rock and Boulder Removal, including but not limited to rock excavation by machine or hand, without use of explosives, and disposal.
2. Only Rocks and Boulders larger than one (1) cubic yard will be considered for payment under this item. Rocks and Boulders smaller than one (1) cubic yard will be classified as earth excavation and not subject to payment under this item.
3. Disintegrated rock which can be removed without the use of explosives or heavy power ripping and boulders smaller in volume than one (1) cubic yard will not be considered for payment under this item, and shall be classified as earth excavation.
4. Broken ledge from previous blasting operations by prior contracting, removed without heavy ripping, will be considered earth excavation and all costs associated will be paid for under the various pipe item.
5. Reinforced concrete road sub-base on West Central Street will not be considered as rock. All costs associated with cutting, removing, hauling, and disposal of the concrete road sub-base shall be included in the applicable pipe items.

1.12 (ITEM 5) PROCESS GRAVEL

A. Measurement

1. Measurement for Process Gravel shall be the actual quantity placed and compacted within the trench limits specified in section 1.2 of this specification section, where ordered by the Owner. Volume shall be calculated from certified weight slips, using a weight to volume conversion factor of 2,800 lbs to 1 cubic yard.
2. Contractor shall submit to the Engineer one (1) copy of the certified weight delivery slips for all Process Gravel used in the Work.

B. Payment

1. Payment for Process Gravel shall be made at the unit price per cubic yard under Item No. 5 in the Agreement. The price shall be full compensation for all costs associated with Process Gravel, including but not limited to furnishing, hauling, placing, and compacting Process Gravel, as specified herein or reasonably implied.
2. No allowance will be made for loss from consolidation of material and all costs associated with re-grading or adding additional gravel for road sub-base due to trench settlement will not be eligible for payment.
3. Process Gravel placed in excess of the trench limits due to Contractor's construction methods, without prior approval of the Engineer, will not be eligible for payment.

1.13 (ITEM 6) ORDINARY BORROW

A. Measurement

1. Measurement for Ordinary Borrow shall be the actual quantity furnished, placed, and compacted within the trench limits in Section 1.2 of this specifications section, where

ordered by the Owner. Truck measurement will not be permitted.

B. Payment

1. Payment for Ordinary Borrow shall be made at the unit price per cubic yard under Item No. 6 in the Agreement. The price shall be full compensation for all costs associated with Ordinary Borrow, including but not limited to furnishing, hauling, placing, and compacting Ordinary Borrow, as specified herein or reasonably implied.
2. Surplus excavated material obtained from construction sites within the limits of this Contract, used for Ordinary Borrow backfill, will not be eligible for payment. Costs for transporting, placing, and consolidating such surplus material shall be included in the unit price for installing pipe.
3. No allowance will be made for loss from consolidation of material.

1.14 (ITEM 7) SELECT BORROW

A. Measurement

1. Measurement for Select Borrow shall be the actual quantity furnished, placed, and compacted within the trench limits in Section 1.2 of this specifications section, where ordered by the Owner.

B. Payment

1. Payment for Select Borrow shall be made at the unit price per cubic yard under Item No. 7 in the Agreement. The price shall be full compensation for all costs associated with Select Borrow, including but not limited to furnishing, hauling, placing, and compacting Select Borrow, as specified herein or reasonably implied.
2. Surplus excavated material obtained from construction sites within the limits of this Contract, used for Select Borrow backfill, will not be eligible for payment. Costs for transporting, placing, and consolidating such surplus material shall be included in the unit price for installing pipe.
3. Surplus material obtained from construction sites within the limits of this Contract may be used for Select Borrow if soil and sieve analysis verifies the material will meet the specifications for Select Borrow under Section 02221, and approved by the Engineer and Owner. Further, representative soil and sieve analysis shall be repeated throughout the project when observed changes in material occur.
4. No allowance will be made for loss from consolidation of material.

1.15 (ITEM 8) CONCRETE SIDEWALK

A. Measurement

1. Measurement for Concrete Sidewalks shall be the actual quantity placed and finished.

B. Payment

1. Payment for Concrete Sidewalk shall be made at the unit price per square yard under Item No. 8 in the Agreement. The price shall be full compensation for all costs associated with Concrete Sidewalk, including but not limited to excavation, grading, compacting and furnishing, placing, reinforcing where required, and finishing concrete, expansion joints and forms, and pipe supports.

2. Precast concrete sections for hydrant and valve support shall not be considered for payment under this item.

#### 1.16 (ITEM 9) TEMPORARY TRENCH PAVING

##### A. Measurement

1. Measurement for Temporary Trench Paving for Route 9 water main replacement shall be calculated by multiplying the actual surface area (square yards) paved, not to exceed the Pavement Payment Limits as specified under this Specification, times the compacted depth of pavement, times a factor of 0.060 for a conversion to ton basis.
2. Temporary Trench Paving to be 3 inches in depth.
3. Contractor shall submit to the Engineer one (1) copy of the certified weight delivery slips for all asphaltic concrete used in the Work.

##### B. Payment

1. Payment for Temporary Trench Paving shall be made at the unit price per ton under Item No. 9 in the Agreement. The price shall be full compensation for all costs associated with Temporary Trench paving, including but not limited to removal of loose asphaltic concrete, hauling and disposal, trench preparation, furnishing pavement mix, placing, grading, and compacting asphaltic concrete, and valve box and rim adjustments as needed.
2. Pavement placed beyond the specified limits under Pavement Payment Limits in this Specification, without prior approval of the Owner and due to the Contractor's operations, shall not be eligible for payment.
3. Additional asphalt needed for roadway patching, as requested by Owner, will be considered for payment under this item.

#### 1.17 (ITEM 10 and 11) PERMANENT TRENCH AND PERMANENT PIT RESURFACING

##### A. Measurement

1. Measurement for Permanent Trench and Permanent Pit Resurfacing shall be calculated by multiplying the actual surface area (square yards) paved, not to exceed the Pavement Payment Limits as specified under this Specification, times the compacted depth of pavement, times a factor of 0.060 for a conversion to ton basis.
2. Contractor shall submit to the Engineer one (1) copy of the certified weight delivery slips for all asphaltic concrete used in the Work.

##### B. Payment

1. Payment for Permanent Trench and Permanent Pit Resurfacing shall be made at the unit price per ton under Item No. 10 No. 11 in the Agreement. The price shall be full compensation for all costs associated with Permanent Trench and Pit Resurfacing, including but not limited to cutting existing pavement and concrete subbase, asphaltic and cement concrete removal, hauling and disposal, tack coat, sand seal, joint and crack sealer, placing, grading, and compacting asphaltic concrete, and valve box and frame adjustments as needed.
2. Pavement placed beyond the specified limits under Pavement Payment Limits in this Specification, without prior approval of the Owner and due to the Contractor's operations, shall not be eligible for payment.

#### 1.18 (ITEM 12) FULL WIDTH OVERLAY RT 135

##### A. Measurement

1. Measurement for Full width Overlay on Rt 135 (East Central Street) shall be calculated by multiplying the actual surface area (square yards) paved, curb to curb, times the compacted depth of pavement, times a factor of 0.060 for a conversion to ton basis.
2. Contractor shall submit to the Engineer one (1) copy of the certified weight delivery slips for all asphaltic concrete used in the Work.

##### B. Payment

1. Payment for Full Width Overlay Resurfacing shall be made at the unit price per ton under Item No. 12 in the Agreement. The price shall be full compensation for all costs associated with overlay paving, including but not limited to sweeping roadway, tack coat, sand seal at each end, joint and crack sealer at each end, placing, grading, and compacting asphaltic concrete.

#### 1.19 (ITEM 13) DUST CONTROL

##### A. Measurement

1. Measurement for payment of dust control treatment shall be by CWT (100 pound measure), for the actual quantity placed.

##### B. Payment

1. Payment for dust control treatment shall be made at the unit price per one hundred (100) lbs. spread under Item No. 13 in the Agreement. The price shall be full compensation for all costs associated with furnishing and placing treatment for dust control.
2. If Contractor has been instructed by the Engineer to install resurfacing but has failed to comply with this instruction and conditions require additional applications, these additional applications shall not be eligible for payment.

#### 1.20 (ITEM 14) MILLING EAST CENTRAL

##### A. Measurement

1. Measurement for Milling East Central shall be calculated by multiplying the actual surface area (square yards) milled.

##### B. Payment

1. Payment for Milling Rt 135 (East Central) shall be made at the unit price per square yard under Item No. 14 in the Agreement. The price shall be full compensation for all costs associated with pavement milling to the required depth, including but not limited to milling, removing millings, sweeping roadway of millings and painting structure edges for vehicle warning.

#### 1.21 (ITEM 15) GRANITE CURB

- A. Measurement
  - 1. Measurement of Granite Curb will be for the actual amount of granite curb removed, reinstalled, and placed, as directed by the Engineer, in linear feet.
- B. Payment
  - 1. Payment for Granite Curb shall be made at the unit price per linear foot under Item No. 15 in the Agreement, where damaged by construction or directed by the Owner. The bid price shall be full compensation for all costs associated with a complete installation, including but not limited to, excavation, backfilling, and compacting, removal, hauling, and disposal of damaged material, and the labor necessary for the first class installation of a new granite curb, concrete facing and the mortaring of all joints as specified or reasonably implied.
  - 2. Granite curb damaged outside payment limits or due to Contractor's negligence shall be replaced by Contractor and will not be eligible for payment.

#### 1.22 (ITEM 16) BITUMINOUS SIDEWALK REPLACEMENT

- A. Measurement
  - 1. Measurement for payment of bituminous sidewalk replacement will be for the amount actually placed, as directed by the Engineer.
- B. Payment
  - 1. Payment for bituminous sidewalk replacement shall be made at the unit price per linear foot, within the payment limits as described in 1.2 Pavement Limits s determined by the Engineer, under Item No. 16 in the Agreement. The price shall be full compensation for all costs for work, including removal and disposal of existing pavement to straight parallel lines furnishing, installing and compacting bituminous concrete and all labor and equipment necessary to complete the work as specified, directed by the Engineer, or reasonably implied.
  - 2. Sidewalk outside the payment limits damaged by the Contractor's negligence shall be replaced by the Contractor and will not be eligible for payment.

#### 1.23 (ITEM 17) LOAM AND SEED

- A. Measurement
  - 1. Measurement for Loam and Seed shall be the actual area covered, in square yards.
- B. Payment
  - 1. Payment for Loam and Seed shall be made at the unit price per square yard under Item No. 17 in the Agreement. The price shall be full compensation for all labor, materials, and equipment incidental thereto for furnishing, hauling and placing loam and spreading seed, lime and fertilizer.
  - 2. Disturbed areas beyond right of ways, or disturbed for Contractor's convenience, shall be restored at the Contractor's expense.
  - 3. The Contractor shall be responsible for periodic water applications and reseeding all areas which do not take. All costs shall be included under this item.

1.24 (ITEM 18 & 19) 6-INCH AND 8-INCH GATE VALVES, 10-INCH AND 12-INCH GATE VALVES

A. Measurement

1. Measurement for 6-Inch, 8-Inch, 10-Inch, and 12-Inch Gate Valves shall be for each Gate Valve furnished and installed as shown on the Drawings or as directed by the Owner.

B. Payment

1. Payment for 6-Inch, 8-Inch, 10-Inch and 12-Inch Gate Valves shall be made at the unit price per each under Item No. 18 and 19, respectively, in the Agreement. The price shall be full compensation for all costs associated with furnishing and installing Gate Vales, including but not limited to setting, supporting, and joint assembly, cleaning, furnishing, and adjustment of valve boxes, and the furnishing and operation of all equipment, tools, and labor necessary for the first class installation of main line gate valves.
2. Work including excavation and backfilling of lining and miscellaneous pits to install Gate Valves is included under the lining or miscellaneous pit items.
3. Gate valves for hydrant assemblies are not included under this item.
4. Gate valve locations may be moved depending on lining and miscellaneous pit locations and Owner approval. Contractor to provide a plan showing proposed bursting pit locations prior to the start of work.
5. Owner may require additional gate valve installed should side street valves not hold water tight. These gate valves will be installed under this item.

1.25 (ITEM 20) SOLID SLEEVES

A. Measurement

1. Measurement for Solid Sleeves shall be for each Solid Sleeve furnished and installed as shown on the Drawings or as directed by the Owner.

B. Payment

1. Payment for Solid Sleeves shall be made at the unit price per each under Item No. 20 in the Agreement. The price shall be full compensation for all costs associated with Solid Sleeves, including but not limited to furnishing, setting, supporting, mechanical joint assembly, retainer gland installation, adjustment of sleeve, and the furnishing and operation of all equipment, tools, and labor necessary for the first class installation of Solid Sleeves.
2. 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 excessive grinding of wall thickness to fit sleeve is required, in the opinion of the engineer, Solid Sleeves are not an option, the Contractor shall furnish and install a "Romac" coupling with Thrust restraint at no additional cost.

1.26 (ITEM 21) FITTINGS

A. Measurement

1. Measurement for Fittings shall be per pound of body weight, excluding the weight of the accessories, such as gaskets, glands, and stainless-steel nuts and bolts.

B. Payment

1. Payment for Fittings shall be made at the unit price per pound under Item No. 21 in the Agreement. The price shall be full compensation for all costs associated with a complete installation, including but not limited to furnishing, setting, supporting, and joint assembly, and the furnishing and operation of all equipment, tools, and labor necessary for the first-class installation of Fittings.
2. Costs associated with retainer glands, joint glands, gaskets, and nuts and bolts shall be included in the cost per pound of fitting body weight.
3. Anchor tees for hydrants to be paid for under this item.

1.27 (ITEM 22) TEMPORARY WATER SERVICE RT 9 & 27 AND EAST CENTRAL

A. Measurement

1. Measurement for payment of Temporary Water Service shall be on a lump sum basis with 60% satisfactory completion of the setup of temporary water bypass, and the final 40% upon satisfactory completion of the temporary water bypass cleanup and removal of equipment.

B. Payment

1. Payment for Temporary Water Service shall be made at the lump sum contract price under Item No. 22 in the Agreement. The price shall be full compensation for all work and costs associated with Temporary Water Service including but not limited to furnishing, maintaining and removal, installing including excavation, trenching pipe across parking lot access, shoring, backfilling, and compaction of individual temporary service connections, disinfection, testing, maintaining, and removing a complete temporary water supply and fire protection for dwellings and businesses affected by the work.
2. All fire connections shall be approved by and meet the requirements of the Fire Chief.
3. At all service connections and couplings, an attached traffic cone shall be provided for safety.
4. Restoration of driveways and/or lawns by gravel, paving, and/or loam and seed application shall be paid for under their respective items.

1.28 (ITEM 23) WATER SERVICES RT 135

A. Measurement

1. Measurement for payment of Water Services in East Central Street shall be the length in linear feet from the main to the curb stop along the centerline of the pipe, as shown on the Drawings or directed by the Owner.

B. Payment

1. Payment for furnishing and installing Water Services shall be made at the price per linear foot under Item 23 in the Agreement. The price shall be full compensation for all costs associated with a complete installation, including but not limited to cutting,

removing and disposal of pavement and concrete sub-base across roadway, excavation of trench and at the water main and curb stop, shoring, backfill (off paved roadway) and compaction, accessing existing curb stop and closing, connecting to existing service pipe, PE pipe, fittings, joint assembly, and cleaning, furnishing, and installation of hardware.

2. All cost to furnish and install 2" diameter PVC sleeve across roadway for new water service to be included in this item.
3. All costs associated with installation in close proximity to trees, poles, walls, landscaping, to be included in this item.
4. All costs required to return landscaping and walls to existing conditions shall be included in this item.
5. Cost to remove and re-set granite curb stone and repair of asphaltic sidewalk, shall be included under appropriate items.
6. All Costs to furnish and install curb stop and box and corporation including tapping of the main shall be included in the Service Valve item.
7. All costs associated with furnishing and installing flowable fill for the service trenches in paved roadway shall be included in this Item No. 23.

#### 1.29 (ITEM 24) WATER SERVICES

##### A. Measurement

1. Measurement for payment of Water Services other than in Route 135 (East Central Street) shall be the length in linear feet from the main to the curb stop along the centerline of the pipe, as shown on the Drawings or directed by the Owner.

##### B. Payment

1. Payment for furnishing and installing Water Services shall be made at the price per linear foot under Item 24 in the Agreement. The price shall be full compensation for all costs associated with a complete installation, including but not limited to excavation at the water main and curb stop, shoring, backfill and compaction of pits, cutting, removal, hauling, and disposing pavement, accessing existing curb stop and closing, connecting to existing service pipe, PE pipe, fittings, joint assembly, and cleaning, furnishing, and installation of hardware.
2. All costs associated with installation in close proximity to trees, poles, walls, landscaping, to be included in this item.
3. All costs required to return landscaping and walls to existing conditions shall be included in this item.
4. Cost to remove and re-set granite curb stone and repair of asphaltic sidewalk, shall be included under appropriate items.
5. All Costs to furnish and install curb stop and box and corporation including tapping of the main shall be included in the Service Valve item.

#### 1.30 (ITEM 25) SERVICE VALVES

A. Measurement for service valves shall be made per each set, curb stop and corporation installed.

B. Payment for service valves shall be made at the unit price per each set under Item 25 in the

Agreement. The price shall be full compensation for all labor, materials, and equipment incidental for a complete installation, including but not limited to furnishing corporation stops, curb stop, curb box, installation of valves, tapping main and making connection to new service.

#### 1.31 (ITEM 26) HYDRANT BRANCHES

##### A. Measurement

1. Measurement for Hydrant shall be per each hydrant branch installed.

##### B. Payment

1. Payment for Hydrant Branches shall be made at the unit price per each under Item No. 26 in the Agreement. The price shall be full compensation for all labor, materials, and equipment incidental thereto for a complete installation, including but not limited to pavement and concrete subbase cutting, removal and disposal, excavation, backfill, and compaction, removal and disposal of existing hydrant branch piping, valves (as necessary), hydrant, installing anchor tee, 6-inch gate valve and box, stainless steel nuts and bolts, 6-inch ductile iron pipe, hydrant, concrete thrust blocks, and fittings, and placing crushed stone drain.
2. Hydrant branch pipe placed beyond ten (10) feet shall be paid under 8" DI Pipe item No. 32.

#### 1.32 (ITEM 27) FURNISHING HYDRANTS

##### A. Measurement

1. Measurement for Furnishing Hydrants shall be per each hydrant furnished and delivered to the Town of Natick DPW gravel pit on Oak Street.

##### B. Payment

1. Payment for Furnishing Hydrants shall be made at the unit price per each hydrant under Item No. 27 in the Agreement. The price shall be full compensation for furnishing, transporting, and delivering hydrants to the Town of Natick DPW yard.

#### 1.33 (ITEM 28) PIT PIPE: 6-INCH THROUGH 12-INCH

##### A. Measurement

1. Measurement for 6-Inch through 12-inch Ductile Iron Pipe installed in pits (Lining and Miscellaneous) shall be in linear feet along the centerline of pipe installed.

##### B. Payment

1. Payment for 6-Inch, 8-Inch, and 10-Inch and 12-Inch Ductile Iron Pipe shall be made at the unit price per linear foot under Item No.28 in the Agreement. The price shall be full compensation for all costs associated with protection of above and below ground utilities and structures, cutting, furnishing and installing new ductile iron pipe and accessories. Newly installed water pipe and appurtenances to be connected to the new and existing water main, pressure tested, bacteria tested, and flushed with cleaned and lined water main.
2. Excavation and backfilling and associated materials to be included under the appropriate items, such as the Miscellaneous Pit item.

## 1.34 (ITEM 29) MISCELLANEOUS PITS

### A. Measurement

1. Measurement for Miscellaneous Pits shall be taken to the lines and grades actually excavated, as approved by the Engineer.

### B. Payment

1. Payment for miscellaneous piping pits shall be made at the unit price per square yard under Item No. 29 in the Agreement. The price shall be full compensation for all costs associated with miscellaneous piping pits, including but not limited to pavement and concrete subbase cutting removal and disposing, excavation by machine or by hand, dewatering, trench support and worker safety systems, exposing and removing pipe, dewatering, removal and disposal of unsuitable material, protection of open trench throughout work, installation of steel plate over excavation when work is not occurring in trench, backfilling and compaction of the backfill, as specified herein or reasonably implied.
2. All costs required to replace side branch gate valves and adding gate valves for the cleaning and lining work to obtain a watertight shut down shall be included in this item.
3. Payment for solid sleeves, replacement pipe, valves, ordinary borrow, process gravel, and asphaltic concrete trench resurfacing will be paid for under appropriate items.
4. Payment for pipe bedding, hauling and disposal of surplus material, shoring and bracing of trenches, utilization of steel shoring boxes, removing and replacement of signs, mail boxes and fences, supporting utility poles, furnishing and display of detour signs, lighted caution horses or barriers, barricades, temporary bridging, shall be included under this item.
5. Payment for refill material purchased by Contractor will be made under the appropriate unit prices, and measured within the specified insertion pit payment limits. Excavation or material placed in excess of the specified payment limits shall be done at the Contractor's expense and will not be eligible for payment, unless additional length, depth or width is ordered by the Owner. Test pits, and pits to replace water services are not included under this item, and shall be paid for under their respective items.
6. Costs for lining pits excavated for the purpose of cement lining will be included under the water main Cleaning and Cement Lining Water Main Items.
7. If Contractor obtains ordinary borrow from the construction project, all costs associated with utilizing the material as trench refill will be included under this item. No payment will be made under the ordinary borrow item.
8. For pits in Route 9 and East Central Street paved roadway require flowable fill for complete backfill. All costs for furnishing and installing flowable fill shall be under the appropriate flowable fill item.
9. All costs associated with loam and seed damaged lawn areas to be included under the loam and seed item.
10. Miscellaneous piping pits shown on Drawings are for estimating purposes only. All costs for miscellaneous piping pits and any additional miscellaneous piping pits not shown on the drawings but excavated by the Contractor as necessary to complete the project shall be compensated under this item.

### 1.35 (ITEM 30) ENVIRONMENTAL CONTROLS

#### A. Measurement

1. Measurement for Environmental Controls shall be the complete implementation of Environmental Controls in compliance with these specifications.

#### B. Payment

1. Payment for Environmental Controls shall be made at the lump sum price under Item No. 30 in the Agreement. The price shall be full compensation for all labor, materials, and equipment associated with Environmental Controls, including but not limited to placement, maintenance, and cleanup of the filter sock, and catch basin silt baskets where directed by the Owner or Engineer, and the placement, maintenance, and disposal of dewatering discharge.

### 1.36 (ITEM 31) BACON ST & TOWN FOREST CONNECTIONS

#### A. Measurement

1. Measurement for Open Cut 12-inch Water Main connections shall be measured when completed.

#### B. Payment

1. Payment for Open Cut 12-inch Water Main connections shall be made at the lump sum price under Item No. 31 in the Agreement. The price shall be full compensation for all costs including but not limited to cutting, removal, hauling, and disposal of pavement, excavation to grade, shoring and bracing of trenches, protection of above and below ground utilities and structures, complete dewatering systems, cutting, draining, removal, and disposal of existing water main and appurtenances as necessary, furnishing and installing new 12-inch ductile iron pipe and accessories, hauling, stockpiling, placement, and compaction of surplus backfill valves, and hauling and disposal of surplus material. Replacement water pipe and appurtenances to be connected to the existing water main and pressure tested.
2. All costs associated with connecting the proposed 12-inch ductile iron pipe to existing 12-inch cast iron pipe on each end shall be included under this item, except as noted below.
3. All costs associated with furnishing select and ordinary borrow and flowable fill for Bacon Street connection (in Bacon Street), and process gravel to be included under the appropriate items.
4. Payment for fittings are included under fittings item.

### 1.37 (ITEM 32) ROUTE 9 WATER MAIN REPLACEMENT

#### A. Measurement

1. Measurement for Open Cut 8-inch Water Main shall be measured along the centerline of the pipe without deductions for valves and fittings for the 8-inch water main.

#### B. Payment

1. Payment for Open Cut 8-inch Water Main shall be made at the unit price under Item No. 32 in the Agreement. The price shall be full compensation for all costs including but not limited to cutting, removal, hauling, and disposal of pavement and concrete sub-base, excavation to grade, shoring and bracing of trenches, protection of above and below ground utilities and structures, complete dewatering systems, cutting, draining, removal, and disposal of existing water main and appurtenances as necessary, furnishing and installing new 8-inch ductile iron pipe and accessories, hauling, stockpiling, placement, and compaction of surplus backfill, and hauling and disposal of surplus material. Replacement water pipe and appurtenances to be connected to the existing water main, pressure tested, bacteria tested, and flushed.
2. All costs associated with connecting the proposed 8-inch ductile iron pipe to existing 8-inch ductile iron and 8-inch cast iron pipe on each end shall be included under this item, except as noted below.
3. All costs associated with furnishing select and ordinary borrow, and process gravel to be included under the appropriate items.
4. Payment for fittings and gate valves are not included under this item.
5. All costs associated with completing work at night shall be included in this item.

1.38 (ITEM 33, 34 & 35) RT 9 8", RT 9 12" & RT 135 10" CLEANING AND LINING

A. Measurement

1. Measurement for the cleaning and lining Rt 9 8-inch, Rt 9 12-inch and Rt 135 (East Central Street) 10-inch C.I. pipe shall be per linear foot. Measurement for length will be along the horizontal centerline of the pipe, with no deductions for valves or fittings. Measurement will be to the nearest tenth of a foot.

B. Payment

1. Payment for cleaning and lining water mains shall be made at the unit price under the appropriate Item no. 33,34 or 35 in the Agreement. Payment for cleaning and cement lining the water mains shall be full compensation for furnishing all labor site preparation, equipment, materials necessary to clean and cement line the existing pipe including but not limited to; cutting and disposal of pavement lining pit excavation, backfilling lining pits, sheeting and bracing lining pits as required, placing and compacting backfill material; removing and disposing of existing pipe, hydrants, valves, fittings and appurtenances, as shown on drawings; cutting existing water mains for access to clean, tv and cement line; water main and trench dewatering, cleaning, inspecting, cement lining including curing, disinfection (chlorinating) the pipe, bacteria testing, thrust restraint where required; removing and reinstalling sections of pipe for visual inspections; cleanup and all related work specified and all else in connection for which separate payment is not provided under other items.
2. All cost associated with water main pre-cement lining and post-cement lining tv-inspection shall be included under this item.\
3. All cost for excavation, hauling and disposal of excavated and surplus materials, backfilling of lining pits (not in Route 9 or 135 pavement), maintenance of backfill material for pipe openings; dewatering, pipe bedding, utilization of steel shoring, boxes and plates and bracing, lining pits where necessary and all other work will be

considered incidental to the cleaning and lining of the water main shall be included under this item.

4. All costs associated with furnishing and installing flowable fill for pits in Route 9, 27 and 135 paved roadway shall be included in the flowable fill item.
5. All costs associated with capturing and properly disposing of all sludge removed from pipe during cleaning shall be included in this item.
6. All costs associated with a third-party leak detection of the completed cleaning and lining segments shall be included in this item.
7. All costs associated with excavating leaks detected in miscellaneous piping pits and lining pits shall be included in this item, with no additional cost paid under this item or other items.

#### 1.39 (ITEM 36) PIT FLOWABLE FILL

##### A. Measurement

1. Measurement for flowable fill for pits on Route 9 and Route 135 (Base Contract) will be made based on length, depth and width of pit filled.

##### B. Payment

2. Payment for flowable fill for pits shall be made at the unit price per cubic yards under Item No. 36 in the Agreement. The price shall be full compensation for a complete installation included but not limited to hauling and installing flowable fill into pits installing and maintaining steel roadway plates until flowable fill has set-up.

#### 1.40 (ITEM 37) DRAIN REPLACEMENT – Where approved by Owner and Engineer

##### A. Measurement

1. Measurement for storm drain replacement will be along the horizontal centerline of the pipe and measurement will be to the nearest tenth of a foot.

##### B. Payment

1. Payment for drain replacement shall be made at the unit price per linear foot for all depths under Item No. 37 in the Agreement. The price shall be full compensation for a complete installation included but not limited to cutting, removal, hauling and disposal of concrete road sub-base and pavement, trench excavation to grade, cutting, removal, hauling and disposal of existing RCP drain, and disposal of surplus material, where required by utility installation and where indicated on the Drawings, protection of above and below ground facilities and structures, complete dewatering systems, new RCP drain, and accessories, placement, compaction and maintenance of backfill material including transportation of excess material from other sites on project to be used as backfill, shoring and bracing of trenches, steel shoring boxes, furnishing and display of detour signs, lighted caution horses or barriers, barricades, temporary bridging, testing, clean-up of construction area, and the furnishing and operation of all equipment, tools, and labor necessary for the first class installation of piping, as herein specified or reasonably implied.
8. Payment for drain replacement will be for approved replacement. Drain, crossing trenches, which are in good shape (Owner's opinion), and are removed by Contractor for convenience will not be eligible for payment under this item. All costs for

convenience drain replacement shall be included in the sewer pipe force main pipe and water main items. All costs for supporting and crossing under drains shall be included the appropriate pipe items.

9. All costs associated with maintaining storm water during work shall be included under this item.
10. If excess material from other Construction sites within this Contract is approved material for backfilling, all costs for transporting, placing and compacting the approved material shall be included in this Item.
11. All costs for furnishing and placing bedding material from grade to 12-inches above crown shall be included in this Item.
12. All costs associated with connecting to existing or new catch basins or manholes including cutting, coring, patching and purging shall be included in this item.

#### 1.41 (ITEM 38) ELECTRONIC MESSAGE BOARDS

##### A. Measurement

1. Measurement for Electronic Message Boards shall be the number of days that electronic message boards are provided for traffic management as directed by the Owner.

##### B. Payment

1. Payment for Electronic Message Boards shall be made at the bid price per day under Bid Item No. 38 in the Agreement. The price shall be full compensation for all labor, materials, and equipment incidental thereto for providing, programming, maintaining, and removing electronic message boards.
2. When an Electronic Message Board is required, it will be maintained on the site for a minimum of seven (7) days for each occasion, in some cases the board may remain for duration of the work, depending on traffic flows.
3. It is possible, depending on Contractors scheduling, that one, two or three signs may be required, one on each site at the same time.

#### 1.42 (ITEM 39) LINE PAINTING

##### A. Measurement

1. Measurement for payment of pavement markings will be for the length of line actually placed, as directed by the Engineer. Cross walk lines will be measured for each individual line painted.

##### B. Payment

1. Payment for pavement markings shall be made at the unit price per linear foot measure as determined by the Engineer under Item No. 39 in the Agreement. The price shall be full compensation for all costs for this work, including material, labor and equipment necessary to complete the work as specified, directed by the Engineer or reasonably implied.
2. Line painting to include white fog lines, double yellow lines, stop lines, cross walk lines and turning arrow lines.

#### 1.43 (ITEM 40 & 41) TRAFFIC MANAGEMENT

A. Measurement

1. Measurement of traffic management shall be made at the following percentages:
  - a. 75% at install as approved by Engineer
  - b. 25% upon removal of signs from Project site after work is completed

B. Payment

1. Payment for traffic management shall be made at the lump sum price under Items No. 40 and 41 in the appropriate percentage for each. The price shall be full compensation for furnishing, installing, maintaining and removing all traffic control devices as specified and shown on the drawings, required by Massachusetts Highway Department and Natick Police Department. Work shall include but not be limited to display of construction signs, detour signs, lighted caution horses or barrels, barricades, concrete "Jersey" barriers including set-up, maintenance and removal.
2. The drawings and specifications detail the minimum requirements for the Traffic Management Plan for each project area. If additional devices are required due to the Contractors approach to the project, then all costs associated shall be included under this item.
3. Route 9 and Route 27 ramp closures and related detours, are included on the traffic management drawings, in case they are needed to complete the work. The Owner would like to avoid closing Route 9 ramps if at all possible, due to traffic volume. All costs associated with providing the traffic control devices as detailed in the specifications and drawings shall be included in this item.
4. If Contractor chooses or is required to complete work at night, other than as required by the specifications and drawings, no additional costs will be considered for traffic management.

## ADDITIONAL ITEMS

### 1.44 (ADD ITEM 1) FOR 10-INCH GATE VALVES

A. Measurement

1. Measurement for 10-Inch Gate Valves shall be for each Gate Valve furnished and installed as shown on the Drawings or as directed by the Owner.

B. Payment

1. Payment for 10-Inch Gate Valves shall be made at the unit price per each under Additional Item No. 1 in the Agreement. The price shall be full compensation for all costs associated with furnishing and installing Gate Vales, including but not limited to setting, supporting, and joint assembly, cleaning, furnishing, and adjustment of valve boxes, and the furnishing and operation of all equipment, tools, and labor necessary for the first class installation of main line gate valves.
2. Work including excavation and backfilling of lining of miscellaneous pits to install Gate Valves is not included under this item.
3. Gate valves for hydrant assemblies are not included under this item.
4. Gate valve locations may be moved depending on lining and miscellaneous pit locations and Owner approval. Contractor to provide a plan showing proposed

- bursting pit locations prior to the start of work.
5. Owner may require additional gate valve installed should side street valves not hold water tight. These gate valves will be installed under this item, with pit excavation and backfill paid under Add. Item 6.

#### 1.45 (ADD ITEM 2) SOLID SLEEVES

- A. Measurement
  1. Measurement for Solid Sleeves shall be for each Solid Sleeve furnished and installed as shown on the Drawings or as directed by the Owner.
- B. Payment
  1. Payment for Solid Sleeves shall be made at the unit price per each under Additional Item No. 2 in the Agreement. The price shall be full compensation for all costs associated with Solid Sleeves, including but not limited to furnishing, setting, supporting, mechanical joint assembly, retainer gland installation, adjustment of sleeve, and the furnishing and operation of all equipment, tools, and labor necessary for the first class installation of Solid Sleeves.
  2. 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 excessive grinding of wall thickness to fit sleeve is required, in the opinion of the engineer, Solid Sleeves are not an option, the Contractor shall furnish and install a "Romac" coupling with Thrust restraint at no additional cost.

#### 1.46 (ADD ITEM 3) FITTINGS

- A. Measurement
  1. Measurement for Fittings shall be per pound of body weight, excluding the weight of the accessories, such as gaskets, glands, and stainless-steel nuts and bolts.
- B. Payment
  1. Payment for Fittings shall be made at the unit price per pound under Additional Item No. 3 in the Agreement. The price shall be full compensation for all costs associated with a complete installation, including but not limited to furnishing, setting, supporting, and joint assembly, and the furnishing and operation of all equipment, tools, and labor necessary for the first-class installation of Fittings.
  2. Costs associated with retainer glands, joint glands, gaskets, and nuts and bolts shall be included in the cost per pound of fitting body weight.
  3. Anchor tees for hydrants to be paid for under the Hydrant Branch item.

#### 1.47 (ADD ITEM 4) TEMPORARY WATER SERVICE

- A. Measurement
  1. Measurement for payment of Temporary Water Service shall be on a lump sum basis with 60% satisfactory completion of the setup of temporary water bypass, and the final 40% upon satisfactory completion of the temporary water bypass cleanup and removal of equipment.

B. Payment

1. Payment for Temporary Water Service shall be made at the lump sum contract price under Additional Item No. 4 in the Agreement. The price shall be full compensation for all work and costs associated with Temporary Water Service including but not limited to furnishing, installing (including excavation, trenching pipe across side streets, backfilling, and compaction of individual temporary service connections), disinfection, testing, maintaining, and removing a complete temporary water supply and fire protection for dwellings and businesses affected by the work.
2. At all service connections and couplings, an attached traffic cone shall be provided for safety.
3. Restoration of driveways and/or lawns by gravel, paving, and/or loam and seed application shall be paid for under their respective items.

1.48 (ADD ITEM 5) PIT PIPE 10" & 6"

A. Measurement

1. Measurement for 10-inch (10") and 6-inch (6") Ductile Iron Pipe installed in pits. Lining and miscellaneous shall be in linear feet along the centerline of pipe installed.

B. Payment

1. Payment for 10 & 6 -Inch Ductile Iron Pipe shall be made at the unit price per linear foot under Additional Item No. 5 in the Agreement. The price shall be full compensation for all costs associated with protection of above and below ground utilities and structures, cutting, furnishing and installing new ductile iron pipe and accessories. Newly installed water pipe and appurtenances to be connected to the new and existing water main, pressure tested, bacteria tested, and flushed with cleaned and lined water main.
2. Excavation and backfilling and associated materials to be included under the appropriate items, such as the Miscellaneous Pit item.

1.49 (ADD ITEM 6) MISCELLANEOUS PITS

A. Measurement

1. Measurement for Miscellaneous Pits shall be taken to the lines and grades actually excavated, as appr by the Engineer.

B. Payment

1. Payment for miscellaneous piping pits shall be made at the unit price per cubic yard under Additional Item No. 6 in the Agreement The price shall be full compensation for all costs associated with miscellaneous piping pits, including but not limited to pavement cutting, excavation by machine or by hand, dewatering, trench support and worker safety systems, exposing and removing pipe, dewatering, removal and disposal of unsuitable material, protection of open trench throughout work, installation of steel plate over excavation when work is not occurring in trench, backfilling and compaction of the backfill, as specified herein or reasonably

- implied.
2. Payment under this item to include pits for removing fitting and gate valves if necessary prior to pipe bursting, and other pits as directed by the Engineer.
  3. Payment for solid sleeves, replacement pipe, valves, ordinary borrow, process gravel, and asphaltic concrete trench resurfacing will be paid for under appropriate items.
  4. Payment for pipe bedding, hauling and disposal of surplus material, shoring and bracing of trenches, utilization of steel shoring boxes, removing and replacement of signs, mail boxes and fences, supporting utility poles, furnishing and display of detour signs, lighted caution horses or barriers, barricades, temporary bridging, shall be included under this item.
  5. Payment for refill material purchased by Contractor will be made under the appropriate unit prices, and measured within the specified insertion pit payment limits. Excavation or material placed in excess of the specified payment limits shall be done at the Contractor's expense and will not be eligible for payment, unless additional length, depth or width is ordered by the Owner. Test pits and pits to replace water services and hydrant connections are not included under this item, and shall be paid for under their respective items.
  6. Costs for lining pits excavated for the purpose of cement lining will be included under the water main Cleaning and Cement Lining Water Main Add. Item.
  7. If Contractor obtains ordinary borrow from the construction project, all costs associated with utilizing the material as trench refill will be included under this item. No payment will be made under the ordinary borrow item.
  8. All costs associated with loam and seed damaged lawn areas to be included under the loam and seed item.
  9. Miscellaneous piping pits shown on Drawings are for estimating purposes only. All costs for miscellaneous piping pits and any additional miscellaneous piping pits not shown on the drawings but excavated by the Contractor as necessary to complete the project shall be compensated under this item.

#### 1.50 (ADD ITEM 7) BACON & EAST CENTRAL CLEANING AND LINING

##### A. Measurement

1. Measurement for the cleaning and lining of 10-inch C.I. pipe on East Central Street (in Wellesley) and in Bacon Street, shall be per linear foot. Measurement for length will be along the horizontal centerline of the pipe, with no deductions for valves or fittings. Measurement will be to the nearest tenth of a foot.

##### B. Payment

1. Payment for cleaning and lining water mains shall be made at the unit price under Additional Item 7 in the Agreement. Payment for cleaning and cement lining the water mains shall be full compensation for furnishing all labor site preparation, equipment, materials necessary to clean and cement line the existing pipe including but not limited to: traffic control, cutting and disposal of pavement insertion pit excavation, excavating and backfilling lining pits, sheeting and bracing lining pits as required, placing and compacting backfill material; removing and disposing of existing pipe, hydrants, valves, fittings and appurtenances, as shown on drawings; cutting existing water mains for access to clean and cement line; water main and

- trench dewatering, cleaning, inspecting, cement lining including curing, disinfection (chlorinating) the pipe, bacteria testing, thrust restraint where required; removing and reinstalling sections of pipe for visual inspections; cleanup and all related work specified and all else in connection for which separate payment is not provided under other items.
2. All Mobilization costs including but not limited to equipment mobilizing and demobilizing, insurance, bonds, contract administration shall be included in this item.
  3. All cost associated with water main pre-cement lining and post-cement lining tv-inspection shall be included under this item.
  4. All cost for excavation, hauling and disposal of excavated and surplus materials, backfilling of lining pits, maintenance of backfill material for pipe openings; dewatering, pipe bedding, utilization of steel shoring, boxes and plates and bracing, lining pits and where necessary and all other work will be considered incidental to the cleaning and lining of the water main shall be included under this item.
  5. All costs associated with furnishing and installing flowable fill in East Central Street pits shall be included in this item.
  6. All costs associated with a third-party leak detection of the completed cleaning and lining segments shall be included in this item.
  7. All costs associated with excavating leaks detected in miscellaneous piping pits and lining pits shall be included in this item, with no additional cost paid under this item or other items.
  8. All cost for traffic management shall be included in this item.

#### 1.51 (ADD ITEM 8) TEMPORARY AND PERMANENT PIT RESURFACING

##### A. Measurement

1. Measurement for Permanent and Temporary Pit Resurfacing shall be calculated by multiplying the actual surface area (square yards) paved, not to exceed the Pavement Payment Limits as specified under this Specification, times the compacted depth of pavement, times a factor of 0.060 for a conversion to ton basis.
2. Contractor shall submit to the Engineer one (1) copy of the certified weight delivery slips for all asphaltic concrete used in the Work.

##### B. Payment

1. Payment for Permanent and Temporary Pit Resurfacing shall be made at the unit price per ton under Add Item No. 8 in the Agreement. The price shall be full compensation for all costs associated with Permanent and Temporary Pit Resurfacing, including but not limited to cutting existing pavement back one foot from initial cut, hauling and disposal, tack coat, sand seal, joint and crack sealer, placing, grading, and compacting asphaltic concrete, and valve box adjustments as needed.
2. Pavement placed beyond the specified limits under Pavement Payment Limits in this Specification, without prior approval of the Owner and due to the Contractor's operations, shall not be eligible for payment.

END OF SECTION

## SECTION 01036

### CHANGES IN CONTRACT WORK, COST OR TIME

#### PART 1 - GENERAL

##### 1.1 DESCRIPTION

- A. Work Included: Contractor shall make such changes in the Work, in the Contract Sum, in the Contract Time of Completion, or any combination thereof, as are described in a Written Amendment, Change Order or Work Change Directive, signed by Owner and issued after execution of the Contract, in accordance with the provisions of this Section, Articles 10, 11, and 12 of the General Conditions, and amendments contained in the Supplemental Conditions.
- B. Owner reserves the right to at any time order additions, deletions, or revisions in the Work, which shall be authorized by Written Amendment, a Change Order, a Work Change Directive, or a Field Order, and Contractor shall promptly proceed with the Work involved.
- C. If Owner or Contractor are unable to agree as to the extent, if any, of an adjustment in the Contract Price or an adjustment in the Contract Times that should be allowed as the result of a Work Change Directive, a claim may be made in accordance with the provisions of Article 10 of the General Conditions.
- D. Upon receipt of any such document, Contractor shall promptly proceed with the Work involved which is to be performed under the applicable conditions of the Contract Documents, unless otherwise specifically provided.
- E. See a full definition of the above in the General Conditions, Article 1, Definitions.

##### 1.2 QUALITY ASSURANCE

- A. Within Contractor's quality assurance program, Contractor shall include such measures as are needed to assure familiarity of Contractor's staff and employees with these procedures for processing Change Order data.
- B. Contractor shall conduct all Work in a first-class, workmanlike manner, and he/she shall use reasonable and appropriate care and skill in the performance of the Work under this Section.

### 1.3 CONTRACT PRICE

- A. The Contract Price constitutes the total compensation (subject to authorized adjustments) payable to Contractor for performing the Work. All duties, responsibilities, and obligations assigned to or undertaken by Contractor shall be at Contractor's expense without change in the Contract Price.
- B. The Contract Price may only be changed by a Change Order or a Written Amendment.

### 1.4 PROCESS FOR INITIATING AND FINALIZING A CHANGE IN CONTRACT PRICE

- A. Any claim for an adjustment in the Contract Price by either party to the Contract shall be based upon written notice delivered by the party making the claim to the other party and Engineer promptly after the start of the occurrence or event giving rise to the claim, and stating the general nature of the claim.
- B. Notice shall be accompanied by claimant's written statement that the adjustment claimed covers all known amounts to which the claimant is entitled as a result of said occurrence or event.
- C. Documentation of the costs for the Work shall be prepared and submitted in accordance with the provisions of Article 11 of the General Conditions and as amended in the Supplementary Conditions of this Contract.
- D. Once the extent of changed Work and compensation amount is finalized in accordance with the provisions of Article 11 of the General Conditions as amended in the Supplementary Conditions, a Change Order Form, as included in Section 00810, with the documentation attached shall be prepared by Engineer and submitted to both parties for review and signing.
- E. Contractor's disagreement with the Change Order shall in no way relieve him/her from the responsibility to immediately proceed with the change as indicated in the Change Order, and to seek settlement of the dispute under the pertinent provisions of this Contract.
- F. Any delay in the completion of the Work associated with a disagreement in the amount of the Change Order shall not constitute a viable reason for granting an extension of time.
- G. No claim for an adjustment in the Contract Price shall be valid unless it is submitted in accordance with the provisions above and those of Article 11 of the General Conditions as amended in the Supplementary Conditions of this Contract.

## 1.5 PROCESS FOR INITIATING AND FINALIZING A CHANGE IN CONTRACT TIME

- A. Any claim for an adjustment in the Contract Time shall be made by a Change Order or Written Amendment, shall be based upon written notice delivered by the party making the claim to the other party and Engineer promptly after the start of the occurrence or event giving rise to the claim, and stating the general nature of the claim.
- B. Notice shall be accompanied by claimant's written statement that the adjustment claimed is the entire adjustment to which the claimant has reason to believe it is entitled as a result of the occurrence of said event.
- C. Once the extent of changed Contract Time, if any, is prepared in accordance with the provisions of Article 12 of the General Conditions, a Change Order shall be prepared for review and signing by both parties.
- D. Contractor's disagreement with the refusal to grant a requested extension in the Contract Time shall in no way relieve him/her from the responsibility to proceed immediately with the Work, and to seek settlement of the dispute under the pertinent provisions of this Contract. Any delay in the completion of the Work shall not constitute a viable reason for granting an extension of time.
- E. No claim for an adjustment in the Contract Time shall be valid if it is not submitted in accordance with the provisions above, as well as those of Article 12 of the General Conditions as supplemented in the Supplementary Conditions of this Contract.

END OF SECTION

## SECTION 01050

### FIELD ENGINEERING

#### PART 1 - GENERAL

##### 1.1 DESCRIPTION

- A. Work Included: Provide such field engineering services as are required for proper completion of the Work including, but not necessarily limited to:
  - 1. Establishing and maintaining lines and levels.
  - 2. Structural design of shores, forms, and similar items provided by the Contractor as part of his means and methods of construction.
- B. Related Work:
  - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.
  - 2. Additional requirements for field engineering also may be described in other sections of these Specifications.

##### 1.2 QUALITY ASSURANCE

- A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the Work of this Section.
- B. The Contractor shall conduct all work in a first-class workmanlike manner, and he/she shall use reasonable and appropriate care and skill in the performance of the Work under this Section.

##### 1.3 PROCEDURES

- A. In addition to procedures directed by the Contractor for proper performance of the Contractor's responsibilities:
  - 1. Locate and protect control points before starting work on the site.
  - 2. Preserve permanent reference points during progress of the Work.
  - 3. Verification of all reference points. If a discrepancy is found, promptly notify Engineer.
  - 4. Promptly advise the Engineer when a reference point is lost or destroyed, or requires relocation because of changes in the Work.

##### 1.4 SURVEY REQUIREMENTS

- A. Contractor shall establish a minimum of two (2) permanent benchmarks on site, reference to data established by survey control points.

- B. Contractor to establish and maintain elevation lines and levels. Locate and lay out by instrumentation and similar appropriate means:
1. Site improvements, including pavements, stakes for grading, fill, and topsoil placement, utility locations, slopes, and invert elevations.
  2. Grid or axis for structures.
  3. Controlling lines and levels required for mechanical and electrical trades.

END OF SECTION

## SECTION 01065

### UNDERGROUND FACILITIES

#### PART 1 - GENERAL

##### 1.1 DESCRIPTION

- A. Work Included: In the performance of the Work of this Contract, the Contractor shall take all the preventative measures to ensure the safety of all the underground facilities encountered. See General Conditions for definition of Underground Facilities.
- B. Related Work:
  - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.
  - 2. Section 02221 Trenching, Backfilling and Compacting

##### 1.2 QUALITY ASSURANCE

- A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specific requirements and the methods needed for proper performance of the Work of this Section.
- B. The Contractor shall conduct all work in a first-class workmanlike manner, and he/she shall use reasonable and appropriate care and skill in the performance of the Work under this Section.

##### 1.3 DEFINITIONS

- A. The words "facilities" and "utilities" as used in these specifications are synonymous.

##### 1.4 UNDERGROUND FACILITIES

- A. It shall be the Contractors responsibility to contact "Dig Safe" and any other utility company not covered under "Dig Safe", for accurate field locations prior to construction, so that the underground facility may be avoided during the operation of the excavating equipment.
  - 1. The Contractor shall familiarize himself with Massachusetts General Law, Chapter 82, Section 40.

## 1.5 PROTECTION OF UNDERGROUND FACILITIES

- A. All existing water pipes and services, gas pipes, electric and telephone conduits, sewers, drains or other underground facilities which are uncovered by the excavation and which do not, in the opinion of the Engineer, require to be changed in location, shall be carefully supported and protected from injury by the Contractor. The Contractor shall be responsible for notifying all underground facility companies of actual damage, suspected disturbance, or any other condition associated with said underground facility, which could remotely result in a leak or break.
  - 1. If the Contractor causes damage to any of the underground facilities during his construction process, and the locations supplied by the various utility companies and departments were "reasonably accurate" (hereinafter defined), the Contractor shall be liable for all costs incurred to repair or replace the damage.
  - 2. For this contract the terminology "reasonably accurate" shall mean within a distance of 4 feet, in any direction, from the location mark supplied by the particular underground facility company or department.

## 1.6 RELOCATION OF UNDERGROUND FACILITIES

- A. Whenever it becomes necessary, in the opinion of the Engineer, to change the location of any underground facility uncovered by the excavation and not otherwise provided for in these Specifications, the Contractor shall do the whole or such portions of making such changes as the Engineer may direct, such Work to be paid for under a Change Order. In removing existing pipes which, in the opinion of the Engineer, are in condition to justify relaying, the Contractor will be held responsible and shall pay for any unnecessary breakage, except that necessary in cutting in at the points of disconnection.
- B. The Contractor shall provide assistance as required to any utility company or department which has to relocate an underground facility due to conflict with the Work of this Contract.

## 1.7 OBSTRUCTION OF FLOWS

- A. The Contractor shall provide suitable temporary channels for the flow of all water courses and shall hold the Owner harmless against all claims for damage growing out of obstruction of the flow in sewers, drains or gutters.

END OF SECTION

## SECTION 01080

### ELECTRONIC VARIABLE MESSAGE SIGN/TRAFFIC MANAGEMENT PLAN

#### PART 1 - GENERAL

##### 1.1 DESCRIPTION

- A. Work Included: The transportation of all equipment to the site, set-up, programming, protection, maintenance, and removal each time the Owner requests the installation of the portable changeable message sign. Contractor shall also be responsible for traffic management, including construction signage as required, and for protecting vehicles and pedestrian traffic. All messages displayed shall be approved by Owner.
- B. Related Work:
  - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.

##### 1.2 QUALITY ASSURANCE

- A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the Work of this Section.
- B. The Contractor shall conduct all work in a first-class workmanlike manner, and he/she shall use reasonable and appropriate care and skill in the performance of the Work under this Section.

##### 1.3 SUBMITTALS

- A. Comply with pertinent provisions of Section 01340.

##### 1.4 PRODUCT HANDLING

- A. Comply with pertinent provisions of Section 01610.

## PART 2 - PRODUCTS

### 2.1 PORTABLE CHANGEABLE MESSAGE SIGN

- A. The portable changeable message sign shall be capable of performing all functions at ambient temperatures ranging from -30°F to 165°F. There shall be no degradation of operation due to fog, rain or snow.
- B. Message board shall be as follows:
  - 1. Type: The display shall be LED.
  - 2. Size: The message board shall have a minimum height of 48 inches, maximum height 72 inches and a minimum width of 60 inches, maximum width of 72 inches.
  - 3. Colors: The display shall be either fluorescent yellow or ITE amber.
  - 4. Lines: The signboard shall have the capability of displaying at least three (3) lines of 12-inch characters with 1 to 9 characters per line.
  - 5. Visibility and viewing angle: The sign shall be visible from a minimum distance of 300 feet with a viewing angle or no less than 30 degrees. The sign shall be either internally or externally illuminated for nighttime visibility.
- C. Operator Interface shall consist of a means of creating and controlling the on-site display message(s) with each sign. The operator interface shall contain, at a minimum, the following:
  - 1. Controller (CPU).
  - 2. Lockable weatherproof enclosure for interface components.
  - 3. Operator's display terminal with keyboard, providing a full screen display to allow the operator to preview the message content and format before it is sent to the sign panel. The keyboard shall be of a standard design.
- D. Controller shall possess, at a minimum, the following features:
  - 1. Full 64K user memory, minimum or as required for the project messages.
  - 2. Changeable message flash rate capability.
  - 3. A minimum of 24-hour battery back-up.
  - 4. Password activation software shall be available.
  - 5. Capacity to store a minimum of 199 pre-defined messages and a minimum of 50 user-created messages (not to exceed 32K).
- E. Power Supply shall consist of the following:
  - 1. A battery with solar charging.
  - 2. The power supply shall have a cover for weather protection and shall be lockable for security.

## 2.2 TRAFFIC MANAGEMENT SIGNS

- A. All traffic management signs shall be in accordance with the Manual on Uniform Traffic Control Devices. At a minimum, see drawings for typical traffic control signs, and traffic control drawings for State road traffic control.
- B. All other traffic control devices/signs (i.e., reflectorized drums with flashing lights) provided for normal operations shall also be provided.
- C. All signs shall be approved by the Owner and shall be in accordance with the contract drawings.

## PART 3 - EXECUTION

### 3.1 GENERAL

- A. The changeable message sign shall be installed and operational for a 7 day period on a minimum of three separate occasions, and be positioned at the direction of the Owner. All other signs shall be used during the entire period of construction. The Contractor shall be responsible for the maintenance of such devices and appurtenances, throughout its use on the project with no additional compensation thereof. Should the units be found to be defective in any way, they shall be replaced immediately at the Contractor's expense.

### 3.2 INSTALLATION AND OPERATION

- A. The Contractor shall be responsible for furnishing, programming, installing, and operating the portable changeable message sign for a period, at a minimum, as required by the Owner.
- B. The Work under this Section includes delivery to required site, set-up of various messages and work required to insure the message sign will operate to the satisfaction of the Owner from 6:00 A.M. to 9:00 P.M. on the days designated by the Owner.
- C. Once the "message sign" is removed from the site, permanent signs indicating "CONSTRUCTION AHEAD. TO AVOID DELAY, SEEK ALTERNATE ROUTES" shall replace the electronic variable message sign.

## 2.3 TRAINING

- A. Contractor to provide the Owner with appropriate training on the unit to allow the Owner to revise the message only.

END OF SECTION

## SECTION 01092

### ABBREVIATIONS

#### PART 1 - GENERAL

##### 1.1 DESCRIPTION

- A. Listing of Abbreviations: The listing of abbreviations in this Specification Section represent the Standard Organization named.
- B. Related Work:
  - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications:
  - 2. All related Specification Sections shall be used in conjunction with this Section.

##### 1.2 QUALITY ASSURANCE

- A. For products or workmanship specified by association, trade, or Federal Standards, comply with requirements of the Standard, except when more stringent requirements are specified or are required by applicable codes.
- B. Conform to reference standard by date of issue current on date for receiving bids.
- C. See Article 3, par 3.3 of the General Conditions.
- D. The Contractor shall conduct all work in a first-class workmanlike manner, and he/she shall use reasonable and appropriate care and skill in the performance of the Work under this Section.

##### 1.3 LISTING OF STANDARD ORGANIZATIONS AND THEIR ABBREVIATIONS:

AA	- Aluminum Association
AAN	- American Association of Nurserymen
AASHTO	- American Association of State Highway and Transportation Officials
ACI	- American Concrete Institute
ADC	- Air Diffusion Council
AGA	- American Gas Association
AHDGA	- American Hot Dip Galvanizers Association
AI	- Asphalt Institute
AIA	- American Institute of Architects
AISC	- American Institute of Steel Construction
AISI	- American Iron and Steel Institute
ANSI	- American National Standards Institute
APA	- American Plywood Association

API	- American Petroleum Institute
ASCE	- American Society of Civil Engineers
ASHRAE	- American Society of Heating, Refrigerating, and Air Conditioning Engineers
ASME	- American Society of Mechanical Engineers
ASTM	- American Society of Testing and Materials
AWPA	- American Wood Preservers Association
AWS	- American Welding Society
AWWA	- American Water Works Association
BIA	- Brick Institute of America
CRSI	- Concrete Reinforcing Steel Institute
CSA	- Canadian Standards Association
DEP	- Department of Environmental Protection
DHI	- Door and Hardware Institute
DIPRA	- Ductile Iron Pipe Research Association
EJCDC	- Engineers Joint Contract Documents Committee
EPA	- Environmental Protection Agency
FM	- Factory Mutual System
Fed. Spec.	- Federal Specification
HI	- Hydraulic Institute
IEEE	- Institute of Electrical and Electronics Engineers
ISA	- Instrument Society of America
MIA	- Masonry Institute of America
MIL	- Military Specification
MSBC	- Massachusetts State Building Code
MSS	- Manufacturers Standardization Society of the Valve and Fitting Industry
NAAMM	- National Association of Architectural Metal Manufacturers
NCMA	- National Concrete Masonry Association
NEC	- National Electrical Code
NEMA	- National Electrical Manufacturers Association
NFPA	- National Fire Protection Association
NRCA	- National Roofing Contractors Association
OSHA	- Occupational Safety and Health Administration
PCA	- Portland Cement Association
PCI	- Prestressed Concrete Institute
PPI	- Plastic Pipe Institute
PS	- Product Standard of the National Bureau of Standards
SDI	- Steel Door Institute
SIGMA	- Sealed Insulating Glass Manufacturers
SMACNA	- Sheet Metal and Air Conditioning Contractors National Association
SPI	- Society of the Plastics Industry
SSPC	- Steel Structures Painting Council
TCA	- Tile Council of America
TPI	- Truss Plate Institute
UL	- Underwriters Laboratories

END OF SECTION

## SECTION 01200

### PROJECT MEETINGS

#### PART 1 - GENERAL

##### 1.1 DESCRIPTION

- A. Work Included: To enable orderly review during progress of the Work, and to provide for systematic discussion of problems, the Engineer will conduct project meetings throughout the construction period.
- B. Related Work:
  - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.
  - 2. 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.

##### 1.2 QUALITY ASSURANCE

- A. 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.
- B. The Contractor shall conduct all work in a first-class workmanlike manner, and he/she shall use reasonable and appropriate care and skill in the performance of the Work under this Section.

##### 1.3 SUBMITTALS

- A. Agenda Items: To the maximum extent practicable, advise the Engineer at least 24 hours in advance of project meetings regarding items to be added to the agenda.
- B. Minutes:
  - 1. The Engineer will compile minutes of each project meeting, and will furnish three (3) copies to the Contractor and required copies to the Owner.
  - 2. Recipients of copies may make and distribute such other copies as they wish.

#### PART 2 - PRODUCTS - No products are required in this Section.

## PART 3 - EXECUTION

### 3.1 MEETING SCHEDULE

- A. Except as noted below for Pre-construction Meeting, project meetings will be held bi-weekly if work progress warrants.
- B. Coordinate as necessary to establish mutually acceptable schedule for meetings.

### 3.2 MEETING LOCATION

- A. The Engineer will establish meeting location. To the maximum extent practicable, meetings will be held at the job site.

### 3.3 PRE-CONSTRUCTION MEETING

- A. Pre-construction Meeting will be scheduled to be held within 15 working days after the Owner has issued the Notice to Proceed.
  - 1. Provide attendance by authorized representatives of the Contractor and major subcontractors.
  - 2. The Engineer will advise other interested parties, including the Owner, and request their attendance.
- B. 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 Engineer.
  - 2. Channels and procedures for communications.
  - 3. Construction schedule, including sequence of critical work.
  - 4. Contract Documents, including distribution of required copies of original Documents and revisions.
  - 5. Processing of Shop Drawings and other data submitted to the Engineer for review.
  - 6. Processing of Bulletins, field decisions, and Change Orders.
  - 7. Rules and regulations governing performance of the Work; and
  - 8. Procedures for security, quality control, housekeeping, and related matters.

### 3.4 PROJECT MEETINGS

- A. 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. Subcontractors, materials suppliers, and others may be invited to attend those project meetings in which their aspect of the Work is involved.
- B. Minimum Agenda:
  - 1. Review, revise as necessary, and approve minutes of previous meetings.
  - 2. Review progress of the Work since last meeting, including status of submittals for approval.
  - 3. Identify problems which impede planned progress.

4. Develop corrective measures and procedures to regain planned schedule.
  5. Complete other current business.
- C. Revisions to Minutes:
1. Unless published minutes are challenged in writing prior to the next regularly scheduled progress 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 as priority portions of "old business" at the next regularly scheduled meeting.

END OF SECTION

## SECTION 01310

### CONSTRUCTION SCHEDULES

#### PART 1 - GENERAL

##### 1.1 SUMMARY

- A. Work Included: To assure adequate planning and execution of the Work so that the Work is completed within the number of calendar days allowed in the Contract, and to assist the Engineer in appraising the reasonableness of the proposed schedule and evaluating progress of the Work, prepare and maintain the schedules and reports described in this Section.
- B. Related Work:
  - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Divisions 1 thru 3 of these Specifications.
  - 2. Preliminary Schedules: General Conditions Sections 2.05-2.07
  - 3. Progress Schedules: General Conditions Section 6.04
  - 4. Change of Schedule: General Conditions Sections 12.02-12.03
  - 5. Failure to Adhere to Schedule: General Conditions Section 15.02
- C. The Construction period shall be that as indicated in the Agreement Section of this Contract.
- D. In accordance with Par. 17.02 of the General Conditions, when calculating any period of time 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.
- E. For purposes of this Contract, a calendar day of 24 hours measured from midnight to the next midnight will constitute a day.

##### 1.2 QUALITY ASSURANCE

- A. Employ a scheduler who is thoroughly trained and experienced in compiling construction schedule data, and in preparing and issuing periodic reports as required.
- B. Perform data preparation, analysis, charting, and updating in accordance with standards approved by the Engineer.
- C. Reliance upon the approved schedule:

1. The construction schedule as approved by the Engineer will be an integral part of the Contract and will establish interim completion dates for the various activities under the Contract.
  2. Should any activity not be completed within 10 days after the stated scheduled date, the Engineer may request the reason for the delay in schedule from the Contractor. The Contractor shall supply the requested information and the steps which he intends to take to get back on schedule.
  3. It is expressly understood and agreed that failure by the Engineer to exercise the option either to order the Contractor to expedite an activity or to expedite the activity by other means shall not be considered to set a precedent for any other activities.
- D. The Contractor shall conduct all work in a first-class workmanlike manner, and he/she shall use reasonable and appropriate care and skill in the performance of the Work under this Section.

### 1.3 SUBMITTALS

- A. Comply with pertinent provisions of Section 01340.
- B. Preliminary Analysis: Within 10 calendar days after the Contractor has received the Owner's Notice to Proceed, submit one (1) electronic copy of a preliminary construction schedule prepared in accordance with Par. 3.1 of this Section.
- C. Construction Schedule: Within 30 calendar days after the Contractor has received the Owner's Notice to Proceed, submit one (1) electronic copy and four (4) printed copies of a construction schedule prepared in accordance with Par. 3.2 of this Section.
- D. Periodic Reports: On the first working day of every month following the submittal described in Par. 1.3.C. above, submit one (1) electronic copy and four (4) printed copies of the updated construction schedule in accordance with Par. 3.3 of this Section.

## PART 2 - PRODUCTS

### 2.1 CONSTRUCTION ANALYSIS

- A. Graphically show by bar-chart, or by other means acceptable to the Engineer, the order and interdependence of all activities necessary to complete the Work, and the sequence in which each activity is to be accomplished, as planned by the Contractor and his project field superintendent, in coordination with all subcontractors whose work is shown on the diagram.
- B. Include, but do not necessarily limit indicated activities to:
1. Project mobilization;
  2. Submittal and approval of Shop Drawings and Samples;
  3. Procurement of equipment and critical materials;
  4. Fabrication of special material and equipment, and its installation and testing;

5. Final cleanup;
6. Final inspecting and testing; and
7. All activities by the Engineer that affect progress, require dates for completion, or both, for all and each part of the Work.

## PART 3 - EXECUTION

### 3.1 PRELIMINARY ANALYSIS

- A. Show all activities of the Contractor under this Work for the period between receipt of Notice to Proceed and submittal of construction schedule.
- B. Show the Contractor's general approach to remainder of the Work.
- C. Show cost of all activities scheduled for performance before submittal and approval of the construction schedule.
- D. Submit in accordance with Par. 1.3.B. of this Section.

### 3.2 CONSTRUCTION SCHEDULE

- A. Within 30 calendar days from receipt of Notice to Proceed, complete the construction analysis in preliminary form, meet with the Engineer, review contents of the proposed construction schedule, and make all revisions agreed upon.
- B. Submit in accordance with Par. 1.3.C. of this Section.

### 3.3 PERIODIC REPORTS

- A. Update the approved construction schedule.
  1. Indicate "actual" progress in percent completion for each activity.
  2. Provide written narrative summary of revisions causing delay in the program, and an explanation of corrective actions taken or proposed.
- B. Submit in accordance with Par. 1.3.D. of this Section.

### 3.4 REVISIONS

- A. Make only those revisions to approved construction schedule as are approved in advance by the Engineer.

END OF SECTION

## SECTION 01340

### SUBMITTALS AND SUBSTITUTIONS

#### PART 1 - GENERAL

##### 1.1 DESCRIPTION

- A. Work Included: Make submittals required by the Contract Documents, and revise and resubmit as necessary to establish compliance with the Contract Document requirements.
- B. Related Work:
  - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Divisions 1 thru 3 of these Specifications.
- C. Work Not Included:
  - 1. Submittals not required under this Contract will not be reviewed by the Engineer.
  - 2. The Contractor may require his subcontractors to provide drawings, setting diagrams, and similar information to help coordinate the Work, but such data shall remain between the Contractor and his subcontractors and will not be reviewed by the Engineer unless specifically called for within the Contract Documents.

##### 1.2 QUALITY ASSURANCE

- A. Coordination of Submittals:
  - 1. Prior to each submittal, carefully review and coordinate all aspects of each item being submitted.
  - 2. Verify that each item and the submittal for its conformity in all respects with the specified requirements.
  - 3. By affixing the Contractor's signature to each submittal, certify that this coordination has been performed.
- B. Substitutions:
  - 1. The Contract is based on the standards of quality established in the Contract Documents. Substitutions will be considered only when they meet those standards of quality.
  - 2. Do not substitute materials, equipment, or methods unless such substitution has been specifically approved in writing for this Work by the Engineer.
- C. "Or equal":
  - 1. Where the phrase "or equal" or "or equal as approved by the Engineer" occurs in the Contract Documents, see Par. 6.05 of the General Conditions.
  - 2. The decision of the Engineer shall be final.

- D. The Contractor shall conduct all work in a first-class workmanlike manner, and he/she shall use reasonable and appropriate care and skill in the performance of the Work under this Section.

### 1.3 SUBMITTALS

- A. Make submittals of Shop Drawings, samples, substitution requests, and other items in accordance with the provisions of this Section.

## PART 2 - PRODUCTS

### 2.1 SHOP DRAWINGS

- A. Scale and Measurements: Make Shop Drawings accurately to a scale sufficiently large to show all pertinent aspects of the item and its method of connection to the Work.
- B. Types of Prints Required:
  - 1. Submit Shop Drawings in the form of six (6) blackline prints of each sheet.
  - 2. Blueprints will not be acceptable.
- C. Review comments of the Engineer will be shown on the blackline print when it is returned to the Contractor. The Contractor may make and distribute such copies as are required for his purposes.

### 2.2 MANUFACTURERS' LITERATURE

- A. Where contents of submitted literature from manufacturers includes data for more than one size, model, or other, clearly indicate which portion of the content is being submitted for review.

### 2.3 SAMPLES

- A. Provide Sample(s) identical to the precise article proposed to be provided. Identify as described under Par. 3.1 in this Section.
- B. Number of Samples Required:
  - 1. Unless otherwise specified, submit Samples in the quantity which is required to be returned, plus one (1) which will be retained by the Engineer.
  - 2. By prearrangement in specific cases, a single Sample may be submitted for review and, when approved, be installed in the Work at a location agreed upon by the Engineer.

### 2.4 COLORS AND PATTERNS

- A. Unless the precise color and pattern is specifically called out in the Contract Documents, and whenever a choice of color or pattern is available in the specified products, submit accurate color and pattern charts to the Engineer for selection.

## PART 3 - EXECUTION

### 3.1 IDENTIFICATION OF SUBMITTALS

- A. Consecutively number all submittals.
  - 1. When material is submitted for any reason, transmit under a new letter of transmittal and with a new transmittal number.
  - 2. On resubmittals, cite the original submittal number and date for reference.
- B. Accompany each submittal with a letter of transmittal showing all information required for identification and checking.
- C. On at least the first page of each submittal, and elsewhere as required for positive identification, show the submittal number in which the item was included.
- D. Maintain an accurate submittal log for the duration of the Work, showing current status of all submittals at all times. Make the submittal log available to the Engineer for his review upon request.

### 3.2 GROUPING OF SUBMITTALS

- A. Unless otherwise specified, make submittals in groups containing all associated items to assure that information is available for checking each item when it is received.
  - 1. Partial submittals may be rejected as not complying with the provisions of the Contract.
  - 2. The Contractor may be held liable for delays so occasioned.

### 3.3 TIMING OF SUBMITTALS

- A. Make submittals in accordance with the schedule listed under the submittal paragraph of each Section of this document which requires submittals. The materials and equipment that need to be included in the submittals are listed, but not limited to, those indicated in the submittal paragraph of each Section of the document.
- B. Make submittals far enough in advance of scheduled dates for installation to provide time required for reviews, for securing necessary approvals, for possible revisions and re-submittals, and for placing orders and securing delivery.
- C. In scheduling, allow at least twenty (20) working days for review by the Engineer following his receipt of the submittal.

### 3.4 ENGINEER'S REVIEW

- A. Review by the Engineer does not relieve the Contractor from responsibility for errors which may exist in the submitted data.

B. Revisions:

1. Make revisions required by the Engineer.
2. If the Contractor considers any required revision to be a change, he shall so notify the Engineer as provided for in Paragraph 10.05 of the General Conditions.
3. Make only those revisions directed or approved by the Engineer.
4. Revise previous submittal drawings or data and resubmit, as specified for the initial submittal.

END OF SECTION

## SECTION 01410

### TESTING LABORATORY SERVICES

#### PART 1 - GENERAL

##### 1.1 DESCRIPTION

- A. Work Included:
  - 1. Cooperate with the Owner's testing agency and all others responsible for testing and inspecting the Work.
  - 2. Provide such other testing and inspecting as are specified to be furnished by the Contractor in this Section and/or elsewhere in the Contract Documents.
- B. Related Work:
  - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.
  - 2. Requirements for testing may be described in various Sections of these Specifications.
  - 3. Where no testing requirements are described, but the Owner decides that testing is required, the Owner may require such testing to be performed under current pertinent standards for testing. Payment for such testing will be made as described in this Section.
- C. Work Not Included:
  - 1. Payment for compaction testing will be the responsibility of the Owner.
  - 2. Selection of testing laboratory: The Owner will select a pre-qualified independent testing laboratory.

##### 1.2 QUALITY ASSURANCE

- A. The testing laboratory will be qualified to the Owner's approval, in accordance with ASTM E329.
- B. Testing, when required, will be in accordance with all pertinent codes and regulations, and with selected standards of the American Society for Testing and Materials.
- C. The Contractor shall conduct all work in a first-class workmanlike manner, and he/she shall use reasonable and appropriate care and skill in the performance of the Work under this Section.

##### 1.3 PRODUCT HANDLING

- A. Comply with pertinent provisions of Section 01610.

- B. Promptly process and distribute required copies of test reports and related instructions to assure necessary re-testing and replacement of materials with the least possible delay in progress of the Work.

## PART 2 - PRODUCTS

### 2.1 PAYMENT FOR TESTING

- A. Initial Services:
  - 1. The Owner will pay for initial and follow up compaction testing services requested by the Engineer. Contractor to pay for subsequent testing of the same area if failure of compaction results continue.
- B. Retesting: When initial test and follow-up test indicate noncompliance with the Contract Documents, subsequent retesting occasioned by the noncompliance shall be performed by the same testing agency, and costs thereof shall be paid in full by Contractor.
- C. Contractor to pay for all bacteriological testing on water mains.
- D. Contractor to pay for all pipe pressure testing.

### 2.2 CODE COMPLIANCE TESTING

- A. Inspections and tests required by codes or ordinances, or by a plan approval authority, and which are made by a legally constituted authority, shall be the responsibility of and shall be paid for by the Contractor, unless otherwise provided in the Contract Documents.

### 2.3 CONTRACTOR'S CONVENIENCE TESTING

- A. Inspecting and testing performed exclusively for the Contractor's convenience shall be the sole responsibility of the Contractor.

## PART 3 - EXECUTION

### 3.1 COOPERATION WITH TESTING LABORATORY

- A. Representatives of the testing laboratory shall have access to the Work at all times and at all locations where the Work is in progress. Provide facilities for such access to enable the laboratory to perform its functions properly.

### 3.2 TAKING SPECIMENS

- A. All specimens and samples for testing, unless otherwise provided in the Contract Documents, shall be taken by the testing personnel. All sampling equipment and personnel will be provided by the testing laboratory. All deliveries of specimens and samples to the testing laboratory will be performed by the testing laboratory.

### 3.3 SCHEDULES FOR TESTING

- A. Establishing Schedule:
  - 1. By advance discussion with the testing laboratory selected by the Owner, determine the time required for the laboratory to perform its tests and to issue each of its findings.
- B. Revising Schedule: When changes of construction schedule are necessary during construction, coordinate all such changes with the testing laboratory as required.
- C. Adherence to Schedule: When the testing laboratory is requested to test, but is prevented from testing or taking specimens due to incompleteness of the Work, all extra charges for testing attributable to the delay may be back charged to the Contractor.

END OF SECTION

## SECTION 01500

### TEMPORARY FACILITIES

#### PART 1 - GENERAL

##### 1.1 DESCRIPTION

- A. Work Included: Provide temporary facilities and controls needed for the Work including, but not necessarily limited to:
  - 1. Sanitary facilities;
  - 2. Enclosures such as tarpaulins, barricades, and canopies;
  - 3. Temporary fencing of the construction site.
- B. Related Work:
  - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.
  - 2. Except that equipment furnished by subcontractors shall comply with requirements of pertinent safety regulations, such equipment normally furnished by the individual trades in execution of their own portions of the Work are not part of this Section.
  - 3. Permanent installation and hookup of the various utility lines are described in other Sections.

##### 1.2 PRODUCT HANDLING

- A. Maintain temporary facilities and controls in proper and safe condition throughout progress of the Work.

#### PART 2 - PRODUCTS

##### 2.1 SANITARY FACILITIES

- A. Sanitary conveniences, properly screened from public observation, for the use of all persons employed on the Work and beginning with the first persons engaged in preliminary operations, shall be provided and maintained by the Contractor in sufficient numbers through the completion of the Work.

## 2.2 WEATHER PROTECTION

- A. Shall mean the temporary protection of that work adversely affected by moisture, wind, and cold by covering, enclosing, and/or heating. This protection shall provide adequate working areas during the months of November through March and be consistent with the approved construction schedule to permit the continuous progress of all work necessary to maintain an orderly and efficient sequence of construction operations. The Contractor shall furnish and install all "weather protection" material and be responsible for all costs, including heating required to maintain a minimum temperature of 40°F at the working surface. This provision does not supersede any specific requirements for methods of construction and/or curing of materials.
- B. Installation of weather protection and heating devices shall comply with all safety regulations including provisions for adequate ventilation and fire protection devices.
- C. The total cost of all weather protection inclusive of all materials, labor, equipment and incidentals required shall be included in the contract price. The cost shall include all work required to furnish, maintain, and remove all temporary enclosures and temporary heating systems required for weather protection.

## PART 3 - EXECUTION

### 3.1 MAINTENANCE AND REMOVAL

- A. Maintain temporary facilities and controls as long as needed for safe and proper completion of the Work.
- B. Remove such temporary facilities and controls as rapidly as progress of the Work will permit, or as directed by the Engineer.

END OF SECTION

## SECTION 01505

### MOBILIZATION

#### PART 1 - GENERAL

##### 1.1 DESCRIPTION

- A. Work Included: Ordering and receipt of all materials, neat stockpiling of such materials, delivery and setup of all construction equipment, and cleanup of stockpile area upon completion of construction.
- B. Related Work:
  - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 thru Divisions 3 of these Specifications.

##### 1.2 QUALITY ASSURANCE

- A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the Work of this Section.
- B. The Contractor shall conduct all work in a first-class workmanlike manner, and he/she shall use reasonable and appropriate care and skill in the performance of the Work under this Section.

##### 1.3 SUBMITTALS

- A. None required under this Section.

##### 1.4 PRODUCT HANDLING

- A. Comply with pertinent provisions of Section 01610

#### PART 2 - PRODUCTS -Not Used

## PART 3 - EXECUTION

### 3.1 STORAGE AREA

- A. It shall be the Contractor's sole responsibility to procure and maintain, either by purchase or rental, any property or easement necessary to provide suitable and adequate storage space for tools, materials and equipment during the progress of the Work if existing project sites are not adequate. The storage or marshalling area obtained by the Contractor shall in no way obstruct or interfere with pedestrian or vehicular movement, and shall not occupy any space within the public right-of-way, except with specific permission from the Owner. The storage area shall be kept in a neat and orderly fashion at all times and shall not be allowed to become a public nuisance.
- B. The Contractor shall remove all excess materials, stockpiles, and equipment from storage sites, sweep rake and generally dress area to condition satisfactory to property Owner upon completion of Contract.
  - 1. The Owner shall not be a party to negotiations related to acquisition of area for storage, or cleanup of same.

### 3.2 EQUIPMENT

- A. The Contractor shall transport all equipment to the site and set up operations to a condition satisfactory to proceed with the intended construction, and upon completion, remove same.

### 3.3 PROJECT MAINTENANCE

- A. The Contractor shall properly maintain the project and storage area during the life of the Contract, and upon completion of work, dismantle storage area and provide general cleanup along the project site.

END OF SECTION

## SECTION 01532

### TREE AND PLANT PROTECTION

#### PART 1 - GENERAL

##### 1.1 DESCRIPTION

- A. The Contractor shall conduct his operations so as to minimize disturbances to ground surfaces in the vicinity of trees and plants that have not been proposed for removal to allow access for the Work of this project, and shall minimize disturbances to the trees and plants not selected for removal in the Contract area.

#### PART 2 - MATERIALS - OMITTED

#### PART 3 - EXECUTION

##### 3.1 TREES

- A. The Contractor shall enclose the trunks of lawn trees and cultivated shrubs adjacent to his work not to be cut, with substantial wooden boxes of such height as may be necessary to protect them from injury from piled material, from equipment, from his operations, or otherwise due to his work. Excavating machinery shall be of suitable type and be operated with care to prevent injury to trees not to be cut and particularly to overhanging branches and limbs.
- B. 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. In case of cutting or unavoidable injury to branches, limbs and trunks of trees, the cut or injured portions, shall be neatly trimmed and covered with an application of grafting wax or tree healing paint as directed.
- C. Small trees, which could be transplanted, may be removed by careful hand digging and placing root system within a burlap container. These trees shall be temporarily planted or stored and maintained by the Contractor to be replanted upon completion of pipe structure installation.

##### 3.2 HEDGES, SHRUBS, AND PLANTS

- A. Cultivated hedges, shrubs, and plants which might be injured by the Contractor's operations shall be protected by suitable means or shall be dug up and temporarily replanted and maintained. After the construction operations have been substantially completed, they shall be replanted in their original positions and cared for until growth is re-established.

### 3.3 REPLACEMENT

- A. If trees, cultivated hedges, shrubs and plants are injured to such a degree as to affect their growth or diminish their beauty or screening effectiveness, they shall be replaced by items of kind and quality at least equal to the kind and quality existing at the start of the Work.

END OF SECTION

## SECTION 01535

### PROTECTION OF PROPERTY

#### PART 1 - GENERAL

##### 1.1 DESCRIPTION

- A. The Contractor shall provide all necessary protection of existing property to prevent any damage to property adjacent to the construction.

#### PART 2 - PRODUCTS - No products are required in this Section.

#### PART 3 - EXECUTION

##### 3.1 PROTECTION OF PROPERTY

- A. The Contractor shall exercise extreme caution while working close to existing shrubs, trees, walls, lawns and other property adjacent to the construction.
  - 1. Contractor shall replace any and all property which was damaged or destroyed as a result of his operations or because of his failure to protect them in a manner which would prevent damage.
  - 2. Property which has been damaged and replaced shall be equal or better than original in quality and workmanship to the damaged property and shall be subject to the approval of the property Owner.
  - 3. Mailboxes, signs, and fences adjacent to or on location of construction shall be carefully removed and temporarily set, to be replaced in original position upon completion of trenching and backfill.
  - 4. Branches which interfere with construction may be removed, only upon approval of the Engineer.
    - a. Limbs and branches shall be trimmed off neatly and cleanly, close to the trunk of the tree or to its main branch. The cut surfaces shall be coated with an approved tree wound coating.
  - 5. Where pipeline installation is in close proximity to utility poles, it shall be the Contractor's responsibility to contact the utility company, and assist in supporting the pole during construction. Any costs associated with pole support shall be paid by the Contractor.

END OF SECTION

## SECTION 01570

### UNIFORMED POLICE OFFICERS

#### PART 1 - GENERAL

##### 1.1 DESCRIPTION

- A. The Contractor shall make all arrangements with the Police Department for the services of Uniformed Police Officers.

#### PART 2 - PRODUCTS

##### 2.1 UNIFORMED POLICE OFFICERS

- A. The Police Safety Officer will assign Uniformed Police Officers from the department in the quantity and at the location(s) as determined to be necessary by the Police Department.

#### PART 3 - EXECUTION

##### 3.1 ARRANGEMENTS

- A. The Contractor shall make all arrangements with the Police Safety Officer for the services of Uniformed Police Officers. If, in the opinion of the Police Department, Uniformed Police Officers are required for the protection of persons and control of traffic, the Contractor shall be responsible for making all arrangements with the Police Safety Officer as may be required.
- B. Contractor to schedule the details in advance to ensure details are available. The Police Department requires a minimum of 48-hour notice for scheduling a detail, however that will not guarantee a detail is available, due to other projects requiring details. It is recommended that the Contractor schedule the details on a weekly basis.
- C. If the Contractor does not request details on a weekly basis, ahead of time, and a detail is not available, the Owner is not responsible for loss production costs of the Contractor if they are not allowed to work on the street.
- D. All time in excess of 8 hours per day shall be pre-approved by the Owner.

##### 3.2 PAYMENT

- A. The Owner shall pay for all Uniformed Police Officers.

- B. If the Contractor fails to cancel a scheduled detail and the Police Department submits a bill, the Contractor will be responsible for paying that bill without reimbursement from the Owner.

END OF SECTION

## SECTION 01601

### CONTROL OF MATERIALS

#### PART 1 - GENERAL

##### 1.1 APPROVAL OF MATERIALS

- A. Unless otherwise specified, only new materials and equipment shall be incorporated in the work. All materials and equipment furnished by the Contractor shall be subject to the inspection and approval of the Engineer. No material shall be delivered to the Work without prior approval of the Engineer.
- B. As specified in Section 01340, the Contractor shall submit to the Engineer data relating to materials and equipment he proposes to furnish for the Work. Such data shall be in sufficient detail to enable the Engineer to identify the particular product and to form an opinion as to its conformity to the Specifications.
- C. Facilities and labor for handling and inspection of all materials and equipment shall be furnished by the Contractor. If the Engineer requires, either prior to beginning or during the progress of the Work, the Contractor shall submit additional samples or materials for such special tests as may be necessary to demonstrate that they conform to the Specifications. Such samples shall be furnished, stored, packed, and shipped as directed at the Contractor's expense. Except as otherwise noted, the Owner will make arrangements for and pay for the tests.
- D. Any delay of approval resulting from the Contractor's failure to submit samples or data promptly shall not be used as a basis of claim against the Owner or the Engineer.
- E. In order to demonstrate the proficiency of workmen or to facilitate the choice among several textures, types, finishes, and surfaces, the Contractor shall provide such samples of workmanship or finish as may be required.
- F. The materials and equipment used on the Work shall correspond to the approved samples or other data.

##### 1.2 HANDLING AND STORAGE OF MATERIALS

- A. All materials and equipment to be incorporated in the Work shall be handled and stored by the manufacturer, fabricator, supplier, and Contractor before, during, and after shipment in a manner to prevent warping, twisting, bending, breaking chipping, rusting, and any injury, theft, or damage of any kind whatsoever to the material or equipment.

- B. Cement and lime shall be stored under a roof and off the ground and shall be kept completely dry at all times. All structural, miscellaneous, and reinforcing steel shall be stored off the ground to prevent accumulations of dirt or grease, and in a position to prevent accumulations of dirt or grease, and in a position to prevent accumulation of standing water and to minimize rusting. Beams shall be stored with the webs vertical. Precast concrete shall be handled and stored in a manner to prevent accumulations of dirt, standing water, staining, chipping, or cracking. Brick, block, and similar masonry products shall be handled and stored in a manner to reduce breakage, chipping, cracking, and spalling to a minimum.
- C. All mechanical equipment subject to corrosive damage by the atmosphere if stored outdoors (even though covered by canvas) shall be stored in a building to prevent injury. The building may be a temporary structure on the site or elsewhere, but it must be satisfactory to the Engineer.
- D. All materials which, in the opinion of the Engineer, have become so damaged as to be unfit for the use intended or specified shall be promptly removed from the site of the Work, and the Contractor shall receive no compensation for the damaged material or its removal.

END OF SECTION

## SECTION 01610

### PRODUCT HANDLING

#### PART 1 - GENERAL

##### 1.1 DESCRIPTION

- A. Work Included: Protect products scheduled for use in the Work by means including, but not necessarily limited to, those described in this Section.
- B. Related Work:
  - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.
  - 2. Additional procedures also may be prescribed in other Sections of these Specifications.
- C. Only new materials and equipment shall be incorporated into the Work.

##### 1.2 QUALITY ASSURANCE

- A. Include within the Contractor's quality assurance program such procedures as are required to assure full protection of work and materials.
- B. The Contractor shall conduct all work in a first-class workmanlike manner, and he/she shall use reasonable and appropriate care and skill in the performance of the Work under this Section.

##### 1.3 MANUFACTURERS' RECOMMENDATIONS

- A. Except as otherwise approved by the Engineer, determine and comply with manufacturers' recommendations on product handling, storage, and protection.

##### 1.4 PACKAGING

- A. Deliver products to the job site in their manufacturer's original container, with labels intact and legible.
  - 1. Maintain packaged materials with seals unbroken and labels intact until time of use.
  - 2. Promptly remove damaged material and unsuitable items from the job site, and promptly replace with material meeting the specified requirements, at no additional cost to the Owner.
- B. The Engineer may reject as non-complying such material and products that do not bear identification satisfactory to the Engineer as to manufacturer, grade, quality, and other pertinent information.

## 1.5 PROTECTION

- A. All materials shall be stored at the project site in a neat and safe manner, properly protected from damage from traffic or equipment.
- B. Any material stored on site shall be safely stockpiled and properly barricaded to prevent a hazard to vehicular or pedestrian traffic.

## 1.6 REPAIRS AND REPLACEMENTS

- A. In event of damage, promptly make replacements and repairs to the approval of the Engineer and at no additional cost to the Owner.
- B. Additional time required to secure replacements and to make repairs will not be considered by the Engineer to justify an extension in the Contract Time of Completion.

END OF SECTION

## SECTION 01700

### CONTRACT CLOSEOUT

#### PART 1 - GENERAL

##### 1.1 DESCRIPTION

- A. Work Included: Provide an orderly and efficient transfer of the completed Work to the Owner.
- B. Related Work:
  - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.
  - 2. "Substantial Completion" is defined in Par. 1.45 of the General Conditions.

##### 1.2 QUALITY ASSURANCE

- A. Prior to requesting inspection by the Engineer, use adequate means to assure that the Work is completed in accordance with the specified requirements and is ready for the requested inspection.
- B. The Contractor shall conduct all work in a first-class workmanlike manner, and he/she shall use reasonable and appropriate care and skill in the performance of the Work under this Section.

##### 1.3 PROCEDURES

- A. Substantial Completion:
  - 1. Within a reasonable time after receipt of the request to inspect, the Engineer will inspect to determine status of completion.
  - 2. Should the Engineer determine that the work is not substantially complete:
    - a. The Engineer promptly will so notify the Contractor, in writing, giving the reasons therefore.
    - b. Remedy the deficiencies and notify the Engineer when ready for reinspection.
    - c. The Engineer will reinspect the Work.
  - 3. When Owner concurs that the Work is substantially complete:
    - a. The Owner will prepare a "Certificate of Substantial Completion", on AIA Form G704, accompanied by the Contractor's list of items to be completed, as verified by the Engineer.
    - b. The Engineer will submit the Certificate to the Owner and to the Contractor for their written acceptance of the responsibilities assigned to them in the Certificate.

- B. Final Completion:
1. Verify that the Work is complete.
  2. Certify that:
    - a. Contract Documents have been reviewed;
    - b. Work has been inspected for compliance with the Contract Documents;
    - c. Work has been completed in accordance with the Contract Documents;
    - d. Equipment and systems have been tested as required, and are operational;
    - e. Work is completed and ready for final inspection.
  3. The Engineer will make an inspection to verify status of completion.
  4. Should the Owner determine that the Work is incomplete or defective:
    - a. The Engineer promptly will so notify the Contractor, in writing, listing the incomplete or defective work.
    - b. Remedy the deficiencies promptly and notify the Engineer when ready for reinspection.
  5. When the engineer determines that the Work is acceptable under the Contract Documents, he will request the Contractor to make closeout submittals.
- C. Closeout submittals include, but are not necessarily limited to:
1. Operation and maintenance manuals for items so listed in pertinent other sections of these Specifications, and for other items when so directed by the Engineer;
  2. Warranties and bonds;
  3. Spare parts and materials extra stock;
  4. Evidence of compliance with requirements of governmental agencies having jurisdiction including, but not necessarily limited to:
    - a. Certificates of Inspection;
    - b. Certificates of Occupancy;
  5. Certificates of Insurance for products and completed operations;
  6. Evidence of payment and release of liens;
  7. List of subcontractors, service organizations, and principal vendors, including names, addresses, and telephone numbers where they can be reached for emergency service at all times including nights, weekends, and holidays.

#### 1.4 INSTRUCTION

- A. Instruct the Owner's personnel in proper operation and maintenance of systems, equipment, and similar items which were provided as part of the Work.

END OF SECTION

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## SECTION 02110

### CLEARING

#### PART 1 - GENERAL

##### 1.1 DESCRIPTION

- A. Work Included: Clear and grub the locus of the proposed pipelines to the limits shown on the Drawings and as required by the Contract Documents.
- B. Related Work:
  - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.
  - 2. Section 02221 Trenching, Backfilling and Compacting

##### 1.2 QUALITY ASSURANCE

- A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the Work of this Section.
- B. Use equipment adequate in size, capacity, and numbers to accomplish the Work of this Section in a timely manner.
- C. The Contractor shall conduct all work in a first-class workmanlike manner, and he/she shall use reasonable and appropriate care and skill in the performance of the Work under this Section.

#### PART 2 - PRODUCTS - NOT USED

#### PART 3 - EXECUTION

##### 3.1 SURFACE CONDITIONS

- A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.
- B. Flag limits of clearing.

### 3.2 PROTECTION

- A. Protect existing utilities indicated or made known.
- B. Protect trees and shrubs, where indicated to remain, by providing a fence around the tree or shrub at its drip line and of sufficient height so trees and shrubs will not be damaged.
- C. All areas not designated to be cleared shall be protected from damage. Clearing operations shall be conducted so that cut trees are felled within the property boundaries and existing trees, designated to remain, are protected from damage.
- D. Protect control points, benchmarks, and existing work from damage.
- E. Maintain access to the site at all times.

### 3.3 CLEARING

- A. Within the area to be cleared:
  - 1. Fell trees and brush.
  - 2. Remove and dispose of all wood.
  - 3. Remove all stumps.
  - 4. Clean out roots 1-inch in diameter and larger to a depth of at least 12 inches below the existing ground surface.

### 3.4 CONSERVATION OF TOPSOIL

- A. After the area has been cleared of vegetation, strip the existing topsoil.
- B. Stockpile in an area clear of new construction.
- C. Maintain the stockpile in a manner which will not obstruct the natural flow of drainage.
  - 1. Maintain stockpile free from debris and trash.
  - 2. Keep the topsoil damp to prevent dust.

### 3.5 REMOVAL AND DISPOSAL

- A. All debris, trees, shrubs, brush, roots, stumps, etc. cleared and grubbed from the site shall be removed from the site and disposed of in accordance with all local and Commonwealth of Massachusetts regulations.
- B. Burning and/or burial of cleared and grubbed material on the site shall not be permitted.

### 3.6 UTILITIES

- A. Coordinate with utility companies and agencies as required.

END OF SECTION

## SECTION 02140

### DEWATERING

#### PART 1 - GENERAL

##### 1.1 DESCRIPTION

- A. Work Included: It is not anticipated that groundwater will be at levels where it will require dewatering for the trench work, with the exception of the 12" cleaning and lining trench near the North Main Street ramp from Rt 9, depending on precipitation events prior to work, will dictate whether dewatering will be necessary. If it is encountered the contractor shall furnish, operate and maintain, as incidental to the project, dewatering equipment for the control, collection and disposal of ground and surface water where necessary to complete the Work.
- B. Related Work:
  - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.

##### 1.2 QUALITY ASSURANCE

- A. Use adequate numbers of skilled workers who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specific requirements and the methods needed for performance of the Work of this Section.
- B. Use equipment adequate in size, capacity, and numbers to accomplish the Work of this Section in a timely manner.
- C. In addition to complying with requirements of governmental agencies having jurisdiction, comply with the directions of the Engineer.
- D. The Contractor shall conduct all work in a first-class workmanlike manner, and he/she shall use reasonable and appropriate care and skill in the performance of the Work under this Section.

##### 1.3 SUBMITTALS

- A. Contractor's Dewatering Plan, including proposed areas for drainage disposal and treatment, shall be available if groundwater is encountered.
- B. Include in the Dewatering Plan, the following:
  - 1. Types and sizes of ground water control systems to be used, including backup power and equipment.

2. Provisions for water treatment and disposal to meet the requirements of all applicable codes.
  3. Provisions for limiting siltation.
  4. Location plan showing recharge pits, discharge piping or channels, and all other discharge components.
- C. Receipt by the Engineer of the Contractor's plan for dewatering shall not obligate the Engineer or Owner for the sufficiency of the Contractor's plan. The Contractor shall be solely responsible for the means, methods, and adequacy of the dewatering system.

#### 1.4 PRODUCT HANDLING

- A. Comply with pertinent provisions of Section 01610.

#### 1.5 COORDINATION

- A. Coordinate the Work of this Section with suppliers and any public agencies which may affect or be affected by the Work of this Section to insure the uninterrupted completion of this work.

### PART 2 - PRODUCTS

#### 2.1 MATERIALS

- A. Piping, plumbing equipment and all other materials and equipment required to provide dewatering of excavations shall be suitable for the intended purposes. Standby pumping units shall be maintained at the site to be used in case of failure of the primary pumping units.

### PART 3 - EXECUTION

#### 3.1 PERFORMANCE

- A. General:
1. Grade and ditch the site as necessary to direct surface runoff away from open excavations and subgrade surfaces.
  2. Keep excavations and site construction areas free from standing water.
  3. Thoroughly brace or otherwise protect against floatation all pipelines and structures which are not stable.
  4. Collect water entering the excavation from surface runoff in shallow ditches around the perimeter of the excavation, drain to sumps and pump from the excavation to maintain a bottom free from standing water.

5. Conduct dewatering in such a manner as to preserve the undisturbed bearing capacity of the subgrade soils at proposed bottom of excavation. Maintain the groundwater level at least 1-foot below the excavation bottom at all times. An unstable or "pumping" subgrade will indicate that dewatering is not adequate and additional dewatering will be required. Construct well or sump installations with proper sand filters to prevent drawing of finer grained soil from the surrounding ground.
6. Take all additional precautions to prevent uplift of any structure during construction.
7. If the material at the bottom of the trench becomes unstable due to an inadequate dewatering system installed by the Contractor, and additional depth of excavation and bedding material is required, this additional work will not be eligible for payment and shall be done at the Contractor's expense.

B. Dewatering System

1. Special dewatering may be required for the utility installations.
2. Install and maintain one (1) groundwater observation well inside the excavation to measure the groundwater level to ensure conformance with the requirements of these Specifications. Construction will not be allowed until the Engineer is satisfied that the above provisions are met.

C. Disposal of Water

1. Dispose of water pumped or drained from the construction trench in a suitable manner to avoid public nuisance, injury to public health, damage to public and private property and damage to the Work completed or in progress.
2. Dispose of drainage so that flow or seepage back into the excavated area will be prevented. Disposal areas shall be approved by the Owner.
3. Monitor the effluent from the pump discharge and from sedimentation basins. Limit the turbidity to no more than 15 NTU.
4. Contractor is responsible for all treatment options necessary to attain the discharge requirement including but not limited to decant basins, siltation collection bags, chemicals and chemical treatment equipment and conventional treatment chemicals and equipment. Do not place the treatment process within 25 feet of a bordering vegetated wetland.
5. Contractor is responsible for obtaining an NPDES Permit, if required.

D. Damage

1. Any damage resulting from the dewatering operations or the failure of the Contractor to maintain the Work in a suitably dry condition shall be repaired by the Contractor at no additional cost to the Owner.

END OF SECTION

## SECTION 02151

### SHORING

#### PART 1 - GENERAL

##### 1.1 DESCRIPTION

- A. Work Included: Provide shoring at excavations and elsewhere as required to protect workmen, materials, existing utilities, adjacent structures, other properties, and the public against collapse, cave in, or settlements.
- B. Related Work:
  - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.
  - 2. As established in the General Condition of the Contract, the Contractor is solely responsible for means and methods of construction and for the sequences and procedures to be used.

##### 1.2 QUALITY ASSURANCE

- A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the Work of this Section.
- B. The Contractor shall not perform excavations in unstable ground and shall employ a positive means of containing the unstable ground behind shoring before excavation may proceed.
- C. Employ a qualified engineer, properly permitted to provide such services at the location of the Work, to design the shoring system(s) and to inspect and report on the quality of its construction.
- D. In addition to complying with requirements of governmental agencies having jurisdiction, comply with the directions of the Engineer.
- E. The Contractor shall conduct all work in a first-class workmanlike manner, and he/she shall use reasonable and appropriate care and skill in the performance of the Work under this Section.

##### 1.3 SUBMITTALS

- A. Comply with pertinent provisions of Section 01340.

- B. Product Data: Within fifteen (15) calendar days after the Contractor has received the Owner's Notice to Proceed, submit:
  - 1. Certified shoring design to Engineer for record purposes only.

## PART 2 - PRODUCTS

### 2.1 DESIGN

- A. Design a shoring system which will safely support and adequately prevent collapse of adjacent materials and which will permit construction of the Work to the arrangement shown on the Drawings.
- B. All shoring shall be designed to support all vertical and lateral loads imposed on the system during construction.
- C. Secure all needed approvals, including those of governmental agencies having jurisdiction and of adjacent property owners if required, at no additional cost to the Owner.

### 2.2 MATERIALS

- A. Provide materials of all kinds as required for execution of the approved shoring system.

## PART 3 - EXECUTION

### 3.1 SURFACE CONDITIONS

- A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

### 3.2 INSTALLATION

- A. Construct and install the shoring system in strict accordance with the design Engineer's requirements.

END OF SECTION

## SECTION 02221

### TRENCHING, BACKFILLING AND COMPACTING

#### PART 1 - GENERAL

##### 1.1 DESCRIPTION

- A. Work Included: The Contractor shall conduct all excavation and backfilling required for the Work, including site mobilization and demobilization, roadway trenching, furnishing lighted caution horses, fences and/or barriers, barrels, barricades, temporary bridging, cutting, removal, and proper disposal of pavement, providing and maintaining basic traffic control devices, excavation in earth and rock for all structures and pipelines, removal and disposal of all unsuitable material, provide required process gravel and select borrow where ordered, trimming and removal of trees, bushes, and brush, disposal of surplus material, shoring, bracing, and sheeting, dewatering systems, backfilling, compaction, and maintenance of backfill material, protection of existing above and below ground facilities, removal and replacement of signs, fences, mailboxes, and guardrails, protection of existing pavements, repairing of broken or disturbed water, sewer, or storm drain piping and structures caused by the Contractor's operations, and all other incidental work necessary to provide the space for the construction of the Work of this Contract, in accordance with the Contract Documents.
- B. Related Work:
1. Documents affecting work of this Section include, but are not limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.
  2. Section 02227            Rock Removal
  3. Section 02490           Loam, Seed, and Sod
  4. Section 02513           Asphaltic Concrete Paving

##### 1.2 QUALITY ASSURANCE

- A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the Work of this Section.
- B. Use equipment appropriate in size, capacity, and numbers to accomplish the Work of this Section in a timely manner.
- C. Comply with all the requirements of the Local and State regulatory agencies which pertain to this Section.

- D. The Contractor shall conduct all work in a first-class workmanlike manner, and he/she shall use reasonable and appropriate care and skill in the performance of the Work under this Section.

### 1.3 SUBMITTALS

- A. Comply with pertinent provisions of Section 01340.

### 1.4 PRODUCT HANDLING

- A. Comply with pertinent provisions of Section 01610.

### 1.5 COORDINATION

- A. Coordinate the Work of this Section in a manner to minimize the impact upon the local businesses and residents.
- B. Coordinate the Work of this Section with suppliers, trades, and any public agencies which may affect or be affected by the Work of this Section to insure the uninterrupted completion of this Work including, but not limited to, the Fire and Police Departments, School Bus Company, US Postal Service, Highway Department, Rubbage Disposal Service, etc.

### 1.6 PERMITS

- A. The Contractor shall obtain a roadway opening permit and trench permit for all work and notify the responsible Public Works Department at least 7 days before any excavation takes place within the roadway.

### 1.7 CLASSIFICATION OF EXCAVATION

- A. All excavation shall be classified as either earth or rock. Rock excavation shall be solid ledge rock, stone masonry or boulders one (1) cubic yard or more in volume. All other materials excavated shall be classified as earth.
  - 1. Concrete road sub-base on west Central will not be considered as Rock

## PART 2 - PRODUCTS

### 2.1 MATERIALS

- A. Fill and Backfill Materials:

1. Ordinary Borrow: Shall be a friable material consisting of stone, sand, and silt with no objects larger than 7 inches in diameter and no more than 30 percent by weight finer than No. 200 sieve, and be free of pavement, trash, loam, ice, snow, tree stumps, and roots. This material must be conducive to proper compaction by the methods to be utilized under this Contract. Excavated trench material from on-site sources which meets these specifications in the Owner's opinion shall be used for Ordinary Borrow trench refill.
2. Select Borrow: Shall be a friable material consisting of a nature of stone, sand, and silt with no objects larger than 3 inches in diameter and no more than 30 percent by weight finer than No. 200 sieve, and be free of pavement, trash, loam, ice, snow, tree stumps, and roots. This material must be conducive to proper compaction by the methods to be utilized under this Contract. Excavated trench material from on-site sources which meets these specifications in the Owner's opinion shall be used for Select Borrow trench refill.
3. Process Gravel: Shall consist of hard durable sand and gravel, be free from ice and snow, roots, sods, rubbish, and other deleterious or organic matter in compliance with M1.03.1 of the MassDOT Division III Material specifications and as further details herein. Maximum stone size shall be 3 inches (greatest dimension). In addition, it shall conform to the following gradation requirements:

<u>Sieve Size</u>	<u>Percent Passing</u>	
	<u>Maximum</u>	<u>Minimum</u>
3-inch	-	100
1 ½-inch	100	70
¾-inch	85	50
No. 4	60	30
No. 200	10	-

- a. Representative soil and sieve analysis shall be performed to verify that the materials comply with the above Specifications and shall be repeated throughout the project when observed changes in materials occur or contamination with other materials is observed.
4. Sand Borrow: Shall consist of clean inert, hard, durable grains of quartz or other durable rock, free from pavement, trash, loam, ice, snow, tree stumps, and roots, with no objects larger than 1-inch in diameter and no more than 10 percent by weight finer than No. 200 sieve. This material must be conducive to proper compaction by the methods to be utilized under this Contract. In addition, it shall conform to the following gradation requirements:

<u>Sieve Size</u>	<u>Percent Passing</u>	
	<u>Maximum</u>	<u>Minimum</u>
1-inch	-	100
½-inch	100	85
No. 4	100	60
No. 16	80	35

No. 50	55	10
No. 200	10	0

- a. Excavated material from on-site sources which meets these specifications in the Owner's opinion shall be used as Sand Borrow refill.
5. Crushed Stone: Shall consist of durable crushed stone or durable crushed gravel stone, washed, free from ice and snow, stone dust, sand, clay, loam, or other deleterious material. The crushed stone shall be uniformly blended and conform to the following:

<u>Sieve Size</u>	<u>Percent Passing</u>	
	<u>Minimum</u>	<u>Maximum</u>
5/8 -inch	-	100
1/2-inch	85	100
3/8-inch	15	45
No. 4	0	15
No. 8	0	5

6. Riprap: Provide riprap for slope protection (where specified on the Drawings) which is sound, durable rock and is angular in shape.
  - a. Stone size shall be based on a D50-10-inch average mix, i.e., 50% shall be greater than 10 inches and 50% will be smaller than 10 inches. Generally, the large stones shall be 1.5 greater in width and 2.25 greater in depth than the average 10-inch size specified.
  - b. Riprap shall be placed on a layer of filter or geotextile fabric specified elsewhere in this Section.
  - c. Voids of the riprap should be filled or chinked with the 50% of the smaller rock of the D50 mix and 3/4-inch crushed stone.
7. Controlled Density Fill (where shown or ordered): Shall consist of Portland cement, fly ash, sand and water. Shall be of Type 2E mix in accordance with Massachusetts Highway Department Specification M4.08.0. The ingredients shall comply with the following:

Portland Cement	AASHTO M85
Fly Ash	AASHTO M295, Class F
Sand	M4.02.02
Air Entraining Admixtures	M4.02.05

## PART 3 - EXECUTION

### 3.1 TRENCH EXCAVATION

- A. The Contractor shall make all excavation in earth and in rock, necessary or incidental to the proposed construction under the terms of this Contract and as herein specified or indicated on the Contract Drawings.

1. Pipe installation shall be accomplished by open cut method, sliplining and pipe bursting or as otherwise stipulated in the Contract.
2. All excavation shall be made in such manner and to such widths as will give ample room for properly installing, constructing, and inspecting pipelines and structures they are to contain.
3. The area around all structures shall be sufficient in width to permit the use of mechanical compactors to easily be walked around the structure for the full height of the trench. If this cannot be accomplished, alternate means of compacting around these zones must be demonstrated to the satisfaction of the Engineer.
4. The Contractor shall be responsible for notifying Dig Safe, the Natick Department of Public Works, and the Owner for field markouts of all utilities, and the Contractor shall plan ahead in the layout of mains, cross connections, repair trenches, pits, and services to avoid these utilities wherever possible.
5. Test pits may be required ahead of construction to confirm location of existing utilities.
6. The width of trenches shall be sufficient to allow thorough compacting of the refill adjacent to the lower quarters of the pipe. At pipe joints, such additional width and depth shall be excavated as is necessary to give ample room for properly making and inspecting the pipe joints.
7. Bottom of trenches in earth shall be excavated reasonably flat and to a depth sufficient to allow the bottom of the water main pipe barrel to rest on relatively undisturbed earth. Blocking is not required under straight lengths of pipe, but the Contractor shall excavate bell holes, by hand, to receive the bell end of the pipe, and to insure that the pipe will be suitably bedded.
8. If rock is encountered, bottom of trenches shall be excavated to a smooth bottom free of major projections, providing a minimum of 12 inches clearance with bottom and sides of pipe, refilled with compacted Select Borrow.
9. Bracing and support of all trench excavation shall meet all requirements of local and State ordinances and OSHA regulations. Sheet piling and bracing, or the use of steel support box, shall be used where required to maintain a safe working condition and provide protection from collapse of the trench walls, undermining of existing pavement, damage to the pipe line appurtenances installed under this Contract, and existing Underground Facilities.
10. Excavation in close proximity to the edge of existing pavements and curbs shall be controlled to minimize damage or disturbance to the pavement and curbing system.

### 3.2 TRENCH EXCAVATION IN PAVED ROADWAYS

- A. In excavating trenches in roadways having an improved Type I asphaltic concrete pavement, the Contractor shall cut pavement twice; once prior to excavation, and again prior to permanent resurfacing, with the exception of West Central Street, where there is a concrete road sub-base, where only one cut is required. The first cut may be made using a water-cooled abrasive saw, pneumatic chisel, pavement grinding equipment, or a wheel cutter attached to a front-end loader, conditions permitting. The second and final cut for existing Type I asphaltic concrete shall be made with a water-cooled abrasive saw or pavement grinding equipment. In all cases, a trial section shall be cut to indicate the performance of the equipment to be utilized.

### 3.3 UNSUITABLE MATERIAL

- A. All pipes and structures are to be laid on stable foundation. If material at grade is determined to be unsuitable by the Engineer, the Contractor shall excavate a further depth and/or width, and refill with an approved material. Refill material shall be process gravel or crushed stone as determined by the Owner. Payment width limits shall be the same as specified for trench excavation, unless an additional width of trench is ordered by the Engineer.
  - 1. Any excavation in excess of the amount ordered by the Engineer shall be backfilled and compacted with an approved granular material, at the Contractors expense.

### 3.4 ROCK REMOVAL

- A. See Specification Section 02227.

### 3.5 DEWATERING

- A. Groundwater is not anticipated on this project, however if encountered, the Contractor shall provide an adequate method of groundwater control, such as pumps or a well point system, to maintain the groundwater level below the bottom of the trench or excavation during the construction period, in such manner as not to interfere with the progress of the Work or cause damage to adjacent Underground Facilities or property.
  - 1. Contractor shall take precaution to prevent the pumping of fines, soil erosion, and the damage of adjacent properties and facilities due to his dewatering application.
  - 2. Contractor shall prevent the flotation of any facilities by maintaining a continuous operation of the dewatering system.
  - 3. If material at the bottom of the trench becomes unstable due to an inadequate dewatering system installed by the Contractor, and additional depth of excavation and bedding material is required, this additional work will not be eligible for payment and shall be done at the expense of the Contractor.

### 3.6 BACKFILLING AND COMPACTING

- A. Backfill shall be placed in uniform 6-inch layers. Each layer of select borrow shall be graded relatively level and thoroughly compacted to a 95% dry density by tamping or vibrating with hand or mechanical compacting equipment around the pipe to 8-inches above the pipe. The remainder of the backfill shall be placed in 6-inch layers, graded relatively level and compacted with hydraulic rammers or other satisfactory compaction equipment.
  - 1. Care shall be taken to compact the backfill materials throughout the full width of the excavation and beneath all pipes and around all structures.
  - 2. The backfilling of trenches shall proceed as soon as the laying of the pipe(s) or installation of the structure(s) will allow. Compaction of initial backfill over the pipe shall be accomplished so as not to cause damage to the underlying pipe. Equipment used for compacting in this zone shall be by use of small vibratory plate compactor making at least three (3) passes.

3. The remainder of backfill to 18-inches below the surface in paved areas and to 6-inches below the surface in landscaped/shoulder areas) shall be ordinary borrow placed in 6"-inch layers, leveled and mechanically compacted with hydraulic rammers, tamping rollers, sheep foot rollers, pneumatic tire rollers, or vibratory rollers which are conducive to the material being compacted.
4. In wetland restoration areas, top 18 inches to be set aside and returned to top of trench.
5. Any pavement falling, caving, or entering the trench during backfilling operations shall be removed before backfilling operations are permitted to continue.
6. The top 18 inches of trench refill in paved areas shall be process gravel placed in 6-inch layers and compacted by hydraulic rammers, plate compactors, or rollers.
7. The top 6 inches of trench refill in landscaped/shoulder areas shall be loam installed in accordance with Section 02490, or process gravel, as ordered by the Owner.
8. When ordered by Owner, the Contractor shall place controlled density fill from 8 inches over the pipe to the roadway surface to be protected with steel plates until cured, and to be later excavated to the depth of the asphaltic concrete to be placed.
9. Safety at the construction site shall entirely be the responsibility of the Contractor. Prior to the end of each day, the Contractor shall backfill the trench or plate the open area and move all equipment off the road by 4:00 P.M..
10. In the event that the leaving of steel trench plates overnight causes a safety hazard in the opinion of the Owner, Police, or MassDOT, the Contractor shall be required to backfill the trench completely at the end of each workday and move all equipment off of paved surfaces.
11. All ordinary borrow and select borrow for trench backfilling shall be obtained from the excavated trench material at the site, or excess material from other construction sites within this Contract if possible. If this material is not available, the Contractor shall furnish same under the appropriate contract item.
12. All rock and boulders shall be kept separate from the excavated earth and properly disposed of by the Contractor. No excavated rock or boulders shall be used as backfill in the pipe trench.
13. All excavated pavements shall be kept separate from the excavated earth and properly disposed of by the Contractor. No excavated pavements shall be used as backfill in the pipe trenches.
14. If undermining of the roadway occurs during excavation, the overhanging section of the road will be removed in order for adequate compaction as specified herein can be accomplished. After backfill and compaction is achieved, the remaining edge of road at the trench will be cut back 12 inches to straight lines parallel to the trench before final trench paving is undertaken.

B. Compacting of Backfill

1. Alternate methods to those specified above for trench compaction within local roadways will only be considered by the Owner if the Contractor can demonstrate to the Owner and Department of Public Works that the method proposed will achieve the 95% dry density required.

C. Backfilling of service lateral trenches shall include compacted sand borrow to 8 inches over service pipe.

### 3.7 SURPLUS MATERIAL

- A. Upon completion of the backfilling of the trenches, if there is surplus material not satisfactory for refill or which cannot be utilized at other sites within this Contract at that time, All surplus material shall become the property of the Contractor for disposal at locations of his choice.

### 3.8 LOAMED AND GRASSED AREAS

- A. Loamed and grassed areas which are disturbed by the Contractor's operation shall be restored to a condition comparable or better than originally found. Replacement loam shall be installed in accordance with Section 02490.

### 3.9 CURB AND SIDEWALK AREAS

- A. Curbs and sidewalks which are disturbed by the Contractor's operation shall be restored to a condition comparable or better than originally found.
- B. All sidewalks to remain passable at all times, where possible. Contractor shall provide proper signage and alternative walking paths if a sidewalk is not passable.
- C. Contractor shall limit downtime for sidewalks.

### 3.10 TEST PIT EXCAVATION

- A. Test pits shall be excavated where ordered by the Engineer or Owner to locate existing Underground Facilities to allow proper alignment of piping.

### 3.11 BASIC PROTECTION OF TRAFFIC

- A. The Contractor shall conduct his work so as to interfere as little as possible with public travel, and shall give property owners the opportunity to enter and leave the premises. Free access shall be provided at all times to existing water gates and fire hydrants in the vicinity of the Work.
  - 1. The Contractor must protect all open excavations, both during and beyond working hours, with lighted barricades, hoses, and/or reflecting barrels, cones, etc. The Contractor shall be entirely responsible for the safety of the public and work force in the immediate area of construction.
  - 2. All lighted barricades, hoses, barrels, cones, signs, and other traffic devices must be highly visible, properly placed, and maintained in that condition and location by the Contractor.
  - 3. Steel plates for trenches shall be a minimum of 1-inch thickness. . All edges and corners of steel plates shall be cold patched. If, in the opinion of the Owner, Police or MassDOT, steel plates may cause vehicle damage, Contractor shall secure plates to the existing roadway surface by pinning
  - 4. Pedestrian traffic shall be maintained throughout construction, through alternative walking paths where necessary..
- B. Emergency Equipment

1. The Contractor shall conduct his operations in a manner that insures access to all areas in the vicinity of the construction by emergency vehicles and equipment, and shall immediately assist any emergency vehicles to pass the construction site.

### 3.12 PROTECTION OF PROPERTY

- A. The Contractor shall exercise extreme caution while working close to existing Underground Facilities, curb and sidewalks, asphaltic concrete and concrete pavement, highway guards, utility poles, signs, mailboxes, shrubs, trees, walls, lawns, and other property adjacent to the construction.
  1. Contractor shall replace any and all property which was damaged or destroyed as a result of his operations or because of his failure to protect them in a manner which would prevent damage.
  2. Property which has been damaged and replaced shall be equal in quality and workmanship to the damaged property and shall be subject to the approval of the property Owner.
  3. Branches which interfere with construction may be removed, only upon approval of the Owner.
    - a. Limbs and branches shall be trimmed off neatly and cleanly, close to the trunk of the tree or to its main branch.
  4. Where pipeline installation is in close proximity to utility poles, it shall be the Contractor's responsibility to contact the utility company and assist in supporting the pole during construction. Any costs associated with pole support shall be paid by the Contractor.
  5. Where pipeline installation requires the removal and replacement of mailboxes, signs, shrubs, timber retaining walls, fences, posts, etc., the Contractor shall remove the item and carefully stockpile it adjacent to the construction site. Once pipeline is installed, the item shall be immediately reinstalled in a professional manner to provide a first class installation.

### 3.13 UNIFORMED POLICE OFFICERS

- A. See Section 01570.

### 3.14 CLEANUP

- A. Cleanup shall be divided into two phases, initial and final.
  1. Initial cleanup shall be daily and follow the construction, and shall never follow further than 50 linear feet from either side of the actual construction site. Initial cleanup shall include, but not be limited to, picking up of all surplus equipment and materials, picking of trash, and dressing up of all roadway trench surfaces prior to replacement of pavement.
  2. Final cleanup shall be completed at the time when all permanent resurfacing will be installed. Contractor shall remove all surplus construction materials and temporary structures, and restore all areas disturbed by his operations to a condition at least equal to condition prior to construction and to the satisfaction of the Engineer.

### 3.15 PLACEMENT OF CONTROLLED DENSITY FILL (CDF) (If Ordered)

- A. The following applies to all trenches where controlled density fill is ordered by the Owner:
  - 1. The Contractor shall place controlled density fill from 8 inches above the pipe to the roadway surface, plate the trench, and let cure for 24 hours. Pinning of the plates may be necessary in high traffic areas.
  - 2. No plates may be left-in-place over the weekend and the Contractor shall schedule the Work accordingly.

### 3.16 FILTER FABRIC (If Ordered)

- A. The Contractor shall furnish and install rolled sheets of filter fabric where shown on the Drawings or as directed by the Owner.
- B. The fabric shall be constructed on two (2) types of continuous filament fibers, one polypropylene and the other being a hetero-filament, comprised of a polypropylene core covered with a nylon sheet. The filaments shall be heat bonded and fabric shall be delivered in rolls covered with black plastic. The material will act as a filter, allowing the passage of water but preventing the migration of fine material into the bedding material.
- C. If filter fabric is ordered by Owner, payment shall be made by Change Order.

END OF SECTION

## SECTION 02225

### FACILITIES

#### PART 1 - GENERAL

##### 1.1 DESCRIPTION

- A. Work Included: In the performance of the Work of this Contract, the Contractor shall take all the preventative measures to insure the safety of all facilities encountered.
- B. Related Work:
  - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.

##### 1.2 QUALITY ASSURANCE

- A. Use adequate numbers of skilled workers who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specific requirements and the methods needed for proper performance of the Work of this Section.
- B. Use equipment adequate in size, capacity, and numbers to accomplish the Work of this Section in a timely manner.
- C. In addition to complying with requirements of governmental agencies having jurisdiction, comply with the directions of the Engineer.
- D. The Contractor shall conduct all work in a first-class workmanlike manner, and he/she shall use reasonable and appropriate care and skill in the performance of the Work under this Section.

##### 1.3 DEFINITIONS

- A. The words "facilities" and "utilities"; as used in these Specifications, are synonymous.
- B. Underground Facilities include, but are not limited to, all pipelines, conduits, ducts, cables, wires, manholes, vaults, tanks, tunnels, or other facilities or attachments, and any casements containing such facilities which have been installed underground to furnish any of the following services or materials:
  - 1. Drinking Water
  - 2. Wastewater
  - 3. Storm Water
  - 4. Electricity
  - 5. Gases
  - 6. Steam

7. Liquid Petroleum Products
8. Telephone
9. Communications
10. Cable Television
11. Traffic Control
12. Fire Prevention
13. Security
14. Irrigation

- C. Municipal Underground Facilities shall include all underground facilities owned or controlled by a Municipal Department or entity, such as a City, Town, or District water or sewer department, electric department, department of public works, or other similar department.
- D. Private Underground Facilities shall include all underground facilities not owned or controlled by a Municipal Department or entity, such as private water or sewer services, electric systems, gas or liquid petroleum systems, telephone and communication systems, cable television systems, irrigation systems, fire prevention and security systems, traffic control systems, and other similar private systems.

#### 1.4 SUBMITTALS

- A. Refer to Section 01340.
- B. Contractor shall submit plans for excavation support and underpinning designed by a licensed Professional Engineer registered in the state of Massachusetts.

#### PART 2 - PRODUCTS – NOT USED

#### PART 3 - EXECUTION

##### 3.1 UNDERGROUND FACILITIES

- A. It shall be the Contractor's responsibility to contact "Dig Safe," (1-800-344-7233) and any other utility company not covered under "Dig Safe", for accurate field locations prior to construction, so that the underground facility may be avoided during the operation of the excavating equipment.
1. The Contractor shall familiarize himself/herself with Massachusetts General Law, Chapter 82, Section 40.
- B. It shall be the Contractor's responsibility to contact all local utility departments, including but not limited to, those existing such as the water and sewer departments, the public works department, the highway department, the local electric department, etc.

### 3.2 PROTECTION OF UNDERGROUND FACILITIES

- A. All underground facilities, including but not limited to, water pipes and services, gas pipes, electric, telephone, and cable conduits and conductors, sewers and drains which are uncovered by the excavation and which do not, in the opinion of the Owner and Engineer, require to be changed in location, shall be carefully supported and protected from injury by the Contractor. The Contractor shall be responsible for notifying all underground facility companies of actual damage, suspected disturbance, or any other condition associated with said underground facility which could remotely result in a leak, break, or disturbance to service, or other occurrence which could precipitate a danger or inconvenience to the public in the future.
1. The Contractor shall make arrangements with the individual agencies and departments for accurate field locations of all Underground Facilities within the construction area, prior to excavation.
  2. If the Contractor causes damage to any of the Municipal Underground Facilities during his/her construction process, and the locations supplied by the various departments were reasonably accurate, it shall be the Contractor's responsibility to make the necessary repairs to the satisfaction of that particular department. The Contractor may make arrangements for the repair work to be done with the authorized representative of said Municipal Underground Facility, with all costs for repair work to be paid for or directly invoiced to the Contractor.
  3. For this Contract, the terminology "reasonably accurate" shall mean within a distance of 4 feet, in any direction, from the location mark supplied by the particular Underground Facility Company or department.
  4. If damage is done to these specific Municipal Underground Facilities by the Contractor, and the actual location in the ground was beyond the "reasonably accurate" limits as marked and provided, in the opinion of the Owner and Engineer, and that the Contractor took the necessary precautions knowing that an Underground Facility existed within the area, the repair work will either be completed by the appropriate department, or by the Contractor, in which case the additional work will be paid for under a Change Order.
  5. If damage is done to Private Underground Facilities, the Contractor shall immediately notify the utility company or owner and provide all assistance as required.

### 3.3 PROTECTION OF UTILITY POLES

- A. The Contractor shall be responsible for making all arrangements with the appropriate utility company for protection and temporary support of utility poles as needed during construction. The Contractor shall be responsible for any costs associated thereto.

### 3.4 PROTECTION OF PRIVATE PROPERTY

- A. The Contractor shall use extreme care while working close to existing shrubs, trees, markers, walls, and other property adjacent to the construction location. If the potential for damage exists, the Contractor may request of the Engineer permission to remove the object and replace same to a condition equal to or better than original.

- B. Mailboxes, signs, and fences adjacent to or on location of construction shall be carefully removed and temporarily set, to be replaced in original position upon completion of trenching and backfill.

### 3.5 RELOCATION OF MUNICIPAL UNDERGROUND FACILITIES

- A. Whenever it becomes necessary, in the opinion of the Engineer and Owner, that a Municipal Underground Facility cannot be avoided in the intended construction, the Owner may order the Contractor to relocate or alter the facility under a Written Amendment or Change Order to the Contract.
- B. In removing existing pipes which, in the opinion of the Owner, are in condition to justify relaying, the Contractor will be held responsible and shall pay for any unnecessary breakage, except that necessary in cutting-in at the points of disconnection.

### 3.6 RELOCATION OF PRIVATE UNDERGROUND FACILITIES

- A. Whenever it becomes necessary in the opinion of the Owner and Engineer, that a Private Underground Facility cannot be avoided in the intended construction, the Owner will deal directly with the utility company in making arrangements for the necessary adjustments or relocation, and pay costs incurred in the Work or charged by the private utility company. The Contractor shall be required to adjust his operations to avoid this location while the negotiations are ongoing, and until the Work is completed.
  - 1. There shall be no additional compensation to the Contractor for the delay or operations adjustment unless such is substantial in nature and time. Thus in this case the occurrence shall not be considered a differing site condition as defined under MGL Chapter 30, Section 39N.
- B. The Contractor shall provide assistance as required to any utility company or department which has to relocate an underground facility due to conflict with the Work of this Contract.
  - 1. Depending upon the extent of assistance and time involved, the Contractor may request compensation through the Change Order process, which will be evaluated based upon the conditions and the documentation provided.

### 3.7 OBSTRUCTION OF FLOWS

- A. The Contractor shall provide suitable temporary channels for the flow of all water courses and shall hold the Owner harmless against all claims for damage growing out of obstruction of the flow in sewers, drains, or gutters, or because of injury to gas, water, or other pipes, conduits, or fixtures relating to the same, and he/she shall give sufficient notice to the proprietors of such pipes or fixtures in time to permit them to cooperate in protecting their property.

END OF SECTION

## SECTION 02227

### ROCK REMOVAL

#### PART 1 - GENERAL

##### 1.1 DESCRIPTION

- A. Work Included: Remove all rock encountered while excavating for structures, roadways, or facility trenches as required by the Contract Documents.
  - 1. Rock removal is not anticipated on this project. However, if rock is encountered per definition in this section, Contractor will be reimbursed through the payment item for removal, hauling and disposal costs.
- B. Related Work:
  - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.
  - 2. Section 02221 Trenching, Backfilling and Compacting

##### 1.2 QUALITY ASSURANCE

- A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the Work of this Section.
- B. In addition to complying with requirements of governmental agencies having jurisdiction, comply with the directions of the Engineer.
- C. The Contractor shall conduct all work in a first-class workmanlike manner, and he/she shall use reasonable and appropriate care and skill in the performance of the Work under this Section.

##### 1.3 DEFINITIONS

- A. Rock Excavation: Rock which requires explosives, wedging or an impact hammer for its removal. Concrete which meets the above definition shall be classified as rock.
- B. Boulders, slabs or other single pieces of material encountered which is less than one (1) cubic yard shall not be considered rock.

##### 1.4 SUBMITTALS

- A. Refer to Section 01340.
- B. If rock is encountered, Contractor shall submit plans for proposed pre-blast survey.

## PART 2 - PRODUCTS - NOT USED

## PART 3 - EXECUTION

### 3.1 NOTIFICATION

- A. When rock is encountered, the material shall be uncovered and the Engineer notified. The Contractor shall provide the Engineer with cross sections of the rock surface. The Engineer shall be present when the cross sections of the rock are made. No payment will be made for any rock removed prior to cross-sectioning as described above.

### 3.2 LIMITS OF EXCAVATION IN ROCK

- A. Excavation in rock shall be performed so that no projection shall come within vertical planes 12 inches outside of the structure being built or 12 inches below the bottom of the structure base slab and footings.
- B. In trenches, the rock shall be removed to the limits shown on the typical trench section. Where excavation is carried beyond the above-determined limits, the additional space shall be refilled at the Contractor's expense with concrete or other specified materials.

### 3.3 BLASTING

- A. Pre-Blast Survey: Prior to any blasting, the Contractor shall submit a pre-blast survey. The survey shall satisfy the insurance requirements of the Contractor and be acceptable to the Contractor's insurance carrier, as well as provide data to assess damages to personal property and real estate due to blasting operations. The survey shall be complete as warranted by the nature of the Work.
- B. Take all precautions necessary to warn or protect any individuals exposed to his operations. Such precautions shall include but not be restricted to the following:
  - 1. Present written certificate of insurance showing evidence that his insurance includes coverage for blasting operations before doing any blasting work.
  - 2. Make necessary arrangements as may be required by the applicable Federal, State, County or Municipal codes, rules, regulations and laws, and shall be responsible for compliance.
    - a. The Contractor shall be required to obtain a permit from the local authorities to perform blasting operations. The Engineer shall be notified in writing that such permit has been obtained.
  - 3. Schedules for blasting shall be thoroughly coordinated with the proper authorities, Federal, State, and Local. No blasting will be done unless the Contractor has notified all concerned parties that he may blast. The Contractor shall also notify any commercial installation in the immediate area whose operations or instrumentation may be affected by blasting, at least 24 hours prior to blasting operations.

4. Seismographic recordings shall be made of all blasting operations on the project by a qualified testing agency hired and coordinated by the Contractor. A copy of these recordings shall be made available to the Owner.
5. Blasting shall be done by experienced powdermen or persons who are licensed or otherwise authorized to use explosives.
6. The Contractor shall be fully responsible for damages caused by his blasting operation.

#### 3.4 DISPOSAL AND REPLACING OF ROCK

- A. Excavated rock shall not be used as trench refill unless processed with other materials to meet specific gradation requirements of fill materials specified in Section 02221 – Trenching, Backfilling and Compacting.
- B. Remove and dispose of all pieces of rock which are not suitable for use in other parts of the Work. Rock disposed of by transportation to spoil areas is to be replaced by surplus excavation obtained elsewhere on the site, insofar as it is available.
- C. Contractor shall be responsible for obtaining spoil locations and the removal of all excess rock from the site.
- D. If rock below limits of excavation is shattered by blasting, caused by holes drilled too deep, or too heavy charges of explosives, or any other circumstance due to blasting, and if such shattered rock does not provide suitable foundation, the rock shall be removed and the excavation refilled with process gravel at the expense of the Contractor.

END OF SECTION

## SECTION 02275

### ENVIRONMENTAL CONTROLS

#### PART 1 - GENERAL

##### 1.1 DESCRIPTION

- A. Work Included: Provide environmental controls as required by the Contract Documents.
- B. Related work:
  - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.
  - 2. All related Specification Sections shall be used in conjunction with this Section

##### 1.2 DEFINITIONS

- A. Resource Areas: Those areas, conditions or features which, when disturbed by construction activities, create an adverse environmental impact. Such areas include, but are not necessarily limited to densely wooded areas, wetland areas, streams, brooks, rivers, and other water crossings and steep slopes.

##### 1.3 SUBMITTALS

- A. Comply with pertinent provisions of Section 01340.
- B. The items under this Section that require submittals are listed, but not limited to the following:
  - 1. Filter Sock.
  - 2. Catch Basin Curb Sack.
- C. Manufacturer's specifications, cut sheets and installation instructions shall be clearly marked with specific product, size, material and other defining characteristics denoted to provide compliance with specified requirements.
- D. The Contractor shall assemble and send six (6) copies of the items listed above to the Engineer in a timely fashion, but in no event later than the date that will ensure receipt by the Engineer within thirty-five days of the Contractor's receipt of the Notice to Proceed.

##### 1.4 PRODUCT HANDLING

- A. Comply with pertinent provisions of Section 01610.

#### PART 2 - PRODUCTS

## 2.1 FILTER SOCK

- A. Filter sock shall be a continuous tubular, 100% cotton fiber knitted mesh netting material filled with compost. For the purposes of specifying the type and quality of product, the Filter Sock described under this Section is based on Filtrex BioSocks, as manufactured by Filtrex International, LLC, Grafton, Ohio. Products of equal material quality and performance that meet the requirements of this specification may be considered.
  - 1. Minimum diameter Filter Sock shall be 12"

## 2.2 FILTER SOCK COMPOST MATERIALS

- A. Compost used for the Filter Sock shall be weed free and derived from a well-decomposed source of organic matter. The compost shall be produced using an aerobic composting process meeting CFR 503 regulations, including time and temperature data indicating effective weed seed, pathogen and insect larvae kill. The compost shall be free of any refuse, contaminants or other materials toxic to plant growth. Non-composted products will not be accepted. Test methods for the items below should follow USCC TMECC guidelines for laboratory procedures:
  - 1. pH – 5.0-8.0 in accordance with TMECC 04.11-A, "Electrometric pH Determinations for Compost".
  - 2. Particle size – 99% passing a 2" sieve and a minimum of 60% greater than the 3/8" sieve, in accordance with TMECC 02.02-B, "Sample Sieving for Aggregate Size Classification".
  - 3. Moisture content of less than 60% in accordance with standardized test methods for moisture determination.
  - 4. Material shall be relatively free (< 1% by dry weight) of inert or foreign man made materials.
  - 5. A sample shall be submitted to the engineer for approval prior to being used and must comply with all local, state and federal regulations.

## 2.3 FILTER SOCK POSTS

- A. Posts shall be of wood or steel and a minimum of 3 feet long. Wood posts shall be nominal 2" x 2". Steel posts shall be round or U, T, or C-shaped with a minimum weight of 1.3 lbs/FT, and have projections for fastening. Installed at a downward 45o angle behind the tubing on the wetland side, do not puncture through the tubing.

## 2.4 CATCH BASIN CURB SACK

- A. Sewn geotextile fabric enclosing a porous structure in the form of a cylindrical tube place in front and extending beyond the inlet the inlet opening on both sides and shall a geotextile fabric sack attached, designed to fit the opening of the catch basin or drop inlet and to hang underneath the grate and into the catch basin.

- B. Shall have lifting straps to allow manual inspection.
- C. Shall utilize an orange monofilament fabric.
- D. Provide Dandy Curb Sack, as manufactured by Dandy Products Inc., Westerville, OH, or approved equal.

## 2.5 OTHER MATERIALS

- A. Provide other materials, not specifically described but required for a complete installation, as selected by the Contractor, subject to the approval of the Engineer.

## PART 3 - EXECUTION

### 3.1 SEDIMENTATION AND EROSION CONTROL

- A. Plan and execute all operations, particularly those associated with excavation and backfilling, in such a manner as to minimize the amount of excavated and exposed fill or other foreign material that is washed or otherwise carried beyond the Limits of Work.
- B. Provide filter sock, and other materials as necessary for sedimentation and erosion control to limit wash out into streams, brooks and wetlands.
- C. In the event of sedimentation or siltation prevention measures used by the Contractor prove to be inadequate, the Contractor shall adjust his operations to the extent necessary to prevent any such sedimentation or siltation from occurring.
- D. Sediment laden water that is being pumped from the trenches or excavations shall not be pumped directly into water courses. Sedimentation basins of filter fabric, crushed stone, wire fencing and silt socks or dewatering bags, other means shall be used for this purpose.

### 3.2 FILTER SOCK

- A. Filter Sock will be placed at locations indicated on the plans, as directed by the Engineer or Owner. Shall be installed parallel to the base of the slope of other affected areas and perpendicular to sheet flow. In extreme conditions (i.e. 2:1 slopes) or when sheet flows to the area from a parcel above the work zone, a second sock shall be constructed at the top of the slope in order to dissipate flows.
- B. Filter Socks (12" - 18" in diameter) may be used in direct flow situations, within runoff channels not to exceed 3 feet in depth. Filter Socks (18" -24" in diameter) should be used for anything larger.

- C. The Contractor shall maintain the Sock in a functional condition at all times and it shall be routinely inspected.
- D. Where the Filter Sock requires repair, it will be routinely repaired.
- E. The Contractor shall remove sediment collected at the base of the Filter Sock when it reaches .5 of the exposed height of the Sock, or as directed by the Engineer. Alternatively, rather than create a soil disturbing activity, the Engineer may call for additional Socks to be added at areas of high sedimentation, placed immediately on top of the existing sediment laden Filter Sock.
- F. The Filter Sock will be left in place, as determined by the Engineer.
- G. Contractor is responsible for establishing a working erosion control system and may with approval of the Engineer, work outside the minimum construction requirements as needed.
- H. Where the Filter Sock deteriorates or fails, it will be repaired or replaced with a more effective alternative.
- I. Contractor is required to be a certified Filter Sock Installer. Certification shall be considered current if appropriate identification is shown during time of bid or at time of application.

### 3.3 CATCH BASIN SILT BASKETS

- A. Catch basin silt baskets to be installed in all catch basins with the project limits to prevent potential silt running down pavement and into catch basin and drains.
- B. Contractor shall periodically clean out silt baskets to remove silt and debris.
- C. Contractor shall clean out all silt baskets before any rain storm.

### 3.4 PROTECTION OF AIR RESOURCES

- A. During the progress of work, the Contractor shall conduct his operations and maintain the area of his activities, including sweeping and sprinkling of water as necessary, so as to minimize the creation and dispersion of dust. If the Owner decides that it is necessary to use calcium chloride for more effective dust control then the Contractor shall furnish and apply the material as directed.
- B. Calcium chloride shall be commercial grade, furnished in 100-pound, 5-ply bags, stored under weatherproof cover and stacked alternately for ventilation. Application for dust control shall be at the rate of about 1/2 pound per square yard per application.
- C. Burning of rubbish and waste material on the site shall not be permitted.

### 3.5 COMPLIANCE

- A. The construction project shall be in compliance with all Federal, State and Local laws with respect to hazardous materials.
- B. All clean up and disposal operations shall comply with all applicable Federal, State, and Local statutes, regulations and ordinances and anti-pollution laws.
- C. Comply with all requirements of all applicable Federal, State, and Local regulations and all permits issued for the Contract.

END OF SECTION

## SECTION 02320

### PIPELINE CLEANING AND TELEVISION INSPECTION

#### PART 1 - GENERAL

##### 1.1 DESCRIPTION

- A. Work included:
  - 1. The Contractor shall provide all equipment, labor and materials required for the initial pipe cleaning and pre and post television inspection for cement mortar relining segment, including but not limited to, hydraulic and/or mechanical cleaning equipment and disposal equipment, hand tool cleaning, closed circuit televising and recording equipment, and the experienced personnel to operate same.
- B. Related work:
  - 1. Section 02765 Lining Cast Iron Pipe

##### 1.2 QUALITY ASSURANCE

- A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.
- B. Use equipment adequate in size, capacity, and numbers to accomplish the work of this Section in a timely manner.
- C. In addition to complying with requirements of governmental agencies having jurisdiction, comply with the directions of the Engineer.
- D. The Contractor shall conduct all work in a first-class workmanlike manner, and he/she shall use reasonable and appropriate care and skill in the performance of the work under this section.

##### 1.3 PRODUCT HANDLING

- A. Comply with pertinent provisions of Section 01610.

##### 1.4 COORDINATION

- A. Coordinate the work of this Section with suppliers, trades and any public agencies which may affect or be affected by the work of this Section to insure the uninterrupted completion of this work.

## 1.5 SCHEDULING

- A. Work shall be scheduled to allow cleaning and television inspection work to be done prior to scheduling of lining application work. The intent of the cleaning and initial television investigation is to insure that piping system is in such condition that liner may be applied without obstruction.
  - 1. The project shall be segregated into sections to allow work to be completed without complete shutdown of the entire pipeline.
  - 2. If a particular segment of water main is found to have an existing cement lining, the Owner shall have the option to only clean that segment of water main. In this case, the Owner will decide if the water main is to be inspected by closed circuit television prior to the cleaning.
  - 3. Upon completion of cleaning and/or lining operation, the sections lined shall be once again inspected by closed circuit television, with a copy of tape to Owner.

## PART 2 - PRODUCTS

### 2.1 CLEANING EQUIPMENT

- A. Allowable cleaning method is mechanical type. Cleaning equipment shall be cable pulled metal scrapers and drag cleaners.
- B. Short sections of piping that cannot be cleaned with conventional processes shall be cleaned by hand with scrapers or brushes made specifically for hand use.

### 2.2 TELEVISION EQUIPMENT

- A. Closed Circuit Television
  - 1. Television camera used for inspection shall be one specifically designed and constructed for such utilization. Lighting for camera shall be suitable to allow a clear color picture for entire periphery of the pipe. Camera shall be operative in 100% humidity conditions. Camera, television monitor and other components of video system shall be capable of producing a minimum 500-line resolution video picture. Picture quality and definition shall be to satisfaction of Engineer and if unsatisfactory, equipment shall be removed and replaced, with no payment made for unsatisfactory inspection.

## PART 3 - EXECUTION

### 3.1 DEWATERING

- A. Contractor shall be responsible for complete dewatering of the existing water main prior to conducting any work.
- B. All water shall be discharged in a way and to an area which will not create traffic hazards, be a nuisance to, obstruct or create damage to any businesses, roadways or areas surrounding the work.

### 3.2 DISINFECTION OF EQUIPMENT

- A. **Contractor shall disinfect all testing, television and any other equipment using a chlorine solution prior to insertion inside the existing and cement lined water mains.**

### 3.3 CLEANING

- A. Designated water main piping sections shall be cleaned using hydraulically propelled, mechanically powered or high velocity cleaning equipment, as specified. The equipment and method selected shall be satisfactory to the Engineer. Equipment for cleaning shall be capable of removing dirt, grease, rocks, sand, and other deleterious materials and obstructions from the water mains, without causing damage to structures. If cleaning of an entire section cannot be successfully performed from one insertion point, equipment shall be re-set at the other insertion point and cleaning again attempted. If, again, successful cleaning cannot be performed or the equipment fails to traverse the entire section, it will be assumed that a major blockage exists and the cleaning effort shall be abandoned.
  - 1. Contractor shall remove a section of existing piping and attach and extend discharge piping to surface. This piping shall be adequately anchored and contain a valve for flow control .
  - 2. All cleaning water, sludge, dirt, sand, rocks, grease and other solid or semi-solid material resulting from cleaning operation shall be removed and contained at discharge point of section being cleaned. Under no circumstances will the discharge of cleaning debris be freely discharged to any ground surfaces. The discharge must be contained and the solids separated from the liquid within the containment.
  - 3. All cleaning water and debris resulting from cleaning process shall be loaded on trucks provided by Contractor each day, and properly disposed of with the residue washed from the surface.
  - 4. It shall be the responsibility of the Contractor to clear line of obstructions that will prevent the installation of cement mortar liner. If inspection reveals an obstruction that cannot be removed by conventional cleaning equipment, then Contractor may be required if directed by the Engineer to make a point repair excavation to uncover and remove or repair the obstruction.

5. During all cleaning operations, satisfactory precautions shall be taken to protect the water main from damage that might be inflicted by improper use of cleaning equipment. No fire hydrant shall be obstructed in case of a fire in an area served by the hydrant, nor shall a hydrant be used for the purpose described unless a vacuum break is provided.
6. Performance of the cleaning process shall be such as to remove all debris, grease, dirt, mineral deposits, roots and other extraneous material from pipelines, to allow a thorough inspection to be performed by closed circuit television, and provide a clean, smooth surface for pipe lining. Any section which is deemed unacceptable shall be re-cleaned at no additional cost to Owner.
7. Upon completion of the cleaning process, a squeegee type device shall be pulled through the entire pipeline to be lined to eliminate any water remaining within the pipeline.

### 3.4 TELEVISION INSPECTION

- A. Camera shall be moved through the line in either direction at a uniform rate, stopping when necessary to insure proper documentation of the water main's condition, but in no case will television camera be pulled at a speed greater than 30 feet per minute. Manual winches, power winches, TV cable and powered rewinds, or other devices that do not obstruct the camera view or interfere with proper documentation of water main conditions shall be used to move camera through the line. If, during the inspection operation, the television camera will not pass through the entire section, Contractor shall re-set up his equipment in a manner so inspection can be performed from opposite access point. If, again, the camera fails to pass through the entire section, the Engineer may order additional cleaning.
  1. Whenever non-remote powered and controlled winches are used to pull television camera through line, telephones or other suitable means of communication shall be set up between the two access points of section being inspected to insure good communications between members of the crews.
  2. Accuracy of measurements cannot be stressed too strongly. Measurement for location of service corporation or other fittings shall be above ground by means of meter device. Marking on cable or the like will not be acceptable. Measurement meters will be accurate to two tenths (0.2) of a foot over length of section being inspected. Accuracy of the measurement meters shall be checked daily by use of a walking meter, roll-a-tape or other suitable device.
  3. Television investigation shall locate all damaged piping and other pertinent information that will be utilized to verify success of lining operation upon completion and final television inspection.
  4. Two (2) Color digital video disks (DVD) shall be submitted to Owner for both pre and post television inspections with accompanying logs for each inspection.
  5. If necessary, Contractor shall control flow of water with by-pass pumping or other means, to insure full visual observation of the pipeline being inspected.

### 3.5 HYDROSTATIC TESTING

- A. For the segments of water main that are only cleaned, the procedures for hydrostatic testing as described in Section 02610 shall be followed.

### 3.6 DISINFECTION

- A. For the segments of water main that are only cleaned, the procedures for disinfection and microbiological testing as described in Section 02610 shall be followed.

END OF SECTION

## SECTION 02490

### LOAM AND SEED

#### PART 1 - GENERAL

##### 1.1 DESCRIPTION

- A. Work Included: Place loam, finish grade, apply lime, fertilizer and seed to all the disturbed lawn areas under the Work of this Contract as specified herein.
- B. Related Work:
  - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.

##### 1.2 QUALITY ASSURANCE

- A. Use adequate numbers of skilled workers who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for performance of the Work of this Section.
- B. Use equipment adequate in size, capacity, and numbers to accomplish the Work of this Section.
- C. In addition to complying with requirements of governmental agencies having jurisdiction, comply with the directions of the Engineer.
- D. If the results of the hydraulic seeding operation are unsatisfactory, the method shall be abandoned and seeding will be required by sowing method.
- E. The Contractor shall conduct all work in a first-class workmanlike manner, and he/she shall use reasonable and appropriate care and skill in the performance of the Work under this Section.

##### 1.3 SUBMITTALS

- A. Comply with pertinent provisions of Section 01340.
- B. Product data: Within thirty (30) calendar days after the Contractor has received the Owner's Notice to Proceed, submit:
  - 1. Complete materials list of items proposed to be provided under this Section.
  - 2. Schedule for seeding and fertilizing.

## 1.4 PRODUCT HANDLING

- A. Comply with pertinent provisions of Section 01610.
- B. Immediately remove from the site, materials which are not true to name and do not comply with the specified requirements, and promptly replace materials meeting the specified requirements.

## PART 2 - PRODUCTS

### 2.1 FERTILIZER

- A. Provide commercial blended 10-20-10 fertilizer delivered to the site in bags labeled with the manufacturer's guaranteed analysis.
  - 1. At least 40% of the nitrogen in the fertilizer used shall be in slowly available (organic) form.

### 2.2 LIME

- A. Lime shall be ground limestone containing not less than 85% calcium and magnesium carbonates.
  - 1. Shall be ground to such fineness that at least 50% will pass through a No. 100 sieve and at least 90% shall pass through a No. 20 sieve.

### 2.3 GRASS SEED

- A. General: Provide grass seed which is:
  - 1. Free from noxious weed seeds, and re-cleaned;
  - 2. Grade A recent crop seed;
  - 3. Treated with appropriate fungicide at time of mixing;
  - 4. Delivered to the site in sealed containers with dealer's guaranteed analysis.
- B. Proportions by weight (Level Areas)
  - 1. Creeping Red Fescue - 60 percent
  - 2. Red Top - 20 percent
  - 3. Kentucky Blue - 20 percent
- C. Proportions by weight (Slopes)
  - 1. Creeping Red Fescue - 40 percent
  - 2. Perennial Ryegrass - 30 percent
  - 3. Red Clover - 10 percent
  - 4. Winter Rye - 15 percent
- D. Within wetland areas (inside BVW where approved by Owner)
  - 1. New England Erosion Control/Restoration Mix for Detention Basins and Moist as furnished by New England Wetland Plants, Inc., Amherst, MA.

## 2.4 LOAM

- A. Loam shall be a mixture of sand, silt, and clay particles as to exhibit sandy and clay-like properties, in and about equal proportions.
  - 1. Shall be free to stumps, roots, heavy or stiff clay, stones larger than 1-inch in diameter, lumps, coarse sand, noxious weeds, sticks, brush, or litter.
  - 2. Shall be obtained from previously excavated materials, stockpiled for this use, or material furnished by Contractor.

## 2.5 OTHER MATERIALS

- A. Provide other materials, not specifically described but required for a complete installation, as selected by the Contractor, subject to the approval of the Engineer.

## PART 3 - EXECUTION

### 3.1 SURFACE CONDITIONS

- A. Examine the areas and conditions under which work of this Section will be performed. Correct all conditions detrimental to timely completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

### 3.2 SPREADING LOAM

- A. Loam shall be placed and prepared by spading or harrowing and raking with iron rakes to a compacted depth of 6 inches.
  - 1. All large lumps, stones, sticks, and roots shall be removed and disposed of by the Contractor.

### 3.3 SEEDING

- A. Preparation
  - 1. Grade seedbeds, thoroughly removing ridges and depressions, and make smooth, continuous, firm planes that ensure proper drainage.
  - 2. Remove soil lumps, rocks, sticks, and other deleterious material.
- B. Lime
  - 1. Apply the approved lime at the rate of 1,000 lbs. of ground limestone per 1,000 sq. ft. of lawn area. Work into the top 3-4 inches.
- C. Fertilizing
  - 1. Apply the specified fertilizer at the rate of 18 lbs. per 1,000 sq. ft., or as required by manufacturer, raking lightly into the soil.
- D. Sowing
  - 1. Sow with a seeder designed for the purpose.
  - 2. Sow at the rate of 5 lbs. per 1,000 sq. ft., or as recommended by manufacturer.

3. Promptly after seeding, wet the seedbed thoroughly, and keep all areas moist throughout the germination period .

E. As soon as seed is sown, it shall be covered with a thin layer of loam and rolled.

F. Protect seeded areas by erecting temporary fences, barriers, signs, and similar protection as necessary to prevent trampling.

#### 3.4 MAINTENANCE

A. The Contractor shall :

1. Keep all seeded and sodded areas watered.
2. Re-seed all areas which do not take.
3. Replace any sections which die during guarantee period.
4. Repair any washouts and re-fertilize and reseed .

#### 3.5 GUARANTEE PERIOD

A. All seeded areas shall be guaranteed by the Contractor for not less than one (1) full year from the date of substantial completion.

END OF SECTION

## SECTION 02513

### ASPHALTIC CONCRETE PAVING

#### PART 1 - GENERAL

##### 1.1 DESCRIPTION

- A. Work Included: Provide asphaltic concrete paving, berms, trench infra-red treatment, pavement markings, calcium chloride, grade adjustment of valve boxes and castings and preparation of the trench as required by the Contract Documents.
- B. Related Work:
  - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.
  - 2. Section 02221 Trenching, Backfilling and Compacting
  - 3. Section 02579 Casting Adjustment

##### 1.2 QUALITY ASSURANCE

- A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.
- B. Comply with pertinent provisions of the following except as may be modified herein.
  - 1. Massachusetts Highway Department, Standard Specifications, for Highways and Bridges of the Commonwealth of Massachusetts latest edition, including all addenda.
- C. The Contractor shall conduct all work in a professional manner, and he/she shall use reasonable and appropriate care and skill in the performance of the Work under this Section.

##### 1.3 SUBMITTALS

- A. Comply with pertinent provisions of Section 01340.
- B. Product Data: Within fifteen (15) calendar days after the Contractor has received the Owner's Notice to Proceed, submit:
  - 1. Materials list of items proposed to be provided under this Section.

##### 1.4 PRODUCT HANDLING

- A. Comply with pertinent provisions of Section 01610.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

- A. Gravel Sub-base – Processed Gravel
  - 1. Shall be as specified in Section 02221.
- B. Asphaltic Concrete paving for temporary and permanent trenches and pits shall be Type I asphaltic concrete conforming to Sections 420, 460, and M3 of the Massachusetts Standard Specifications.
- C. Asphalt - Tack coat shall consist of either emulsified asphalt, grade RS-1 conforming to Section M3.03.1, or cutback asphalt, grade RC-70 or RC-250 conforming to Section M3.02.0 of the Massachusetts Standard Specifications.
- D. Pavement marking paint shall be fast drying type (P-226) conforming to Section M7.01.10 or M7.01.11, (Fast Drying White or Yellow Traffic Paint) of the above-mentioned Specifications.
- E. Joint and crack sealer – This material shall meet MassDOT Standard M3.05.4 Hot Applied Bituminous Concrete Crack Sealer conforming to requirements in Federal Specification SS-S-1401

## PART 3 - EXECUTION

### 3.1 SURFACE CONDITIONS

- A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

### 3.2 FINAL PREPARATION OF SUBGRADES

- A. Place gravel subgrade to depths indicated on the Drawings and compact by the methods specified in Section 02221.
  - 1. Remove all loose materials from the compacted base prior to placing the asphaltic concrete pavement.

### 3.3 GENERAL

- A. All asphaltic concrete thickness referred to herein are compacted thickness.
- B. No asphaltic concrete shall be placed when the air temperature is below 40°F, or when the material on which the mixtures are to be placed contain frost.

- C. No permanent resurfacing shall be placed in roadways after November 15 or before April 1, unless permission to do so is granted in writing by the Owner. Roadway construction work which will require paving after the closing of the "hot-mix" plants shall be paved with "cold mix".
- D. Minimum temperature of asphaltic concrete after spreading and prior to compaction shall be 225°F, and any mixture below this temperature shall be removed from site and will not be eligible for payment.
- E. In conformance with Section 460.61 of the Massachusetts Highway Department Standard Specifications, the temperature of the mixture, within a tolerance of  $\pm 15^{\circ}\text{F}$ , when delivered to the project site, will be given by the temperature of the base upon which the mix is placed as follows:

Base Temp (°F)	1-1/2"	2"	3" or Greater
35-40	305	295	280
40-50	300	285	275
50-60	295	280	270
60-70	285	275	265
70-80	280	270	265
80-90	270	265	260
90+	265	260	255

- F. The Contractor shall notify all utility companies four (4) weeks in advance of resurfacing, as to the number and location of covers and boxes which require adjustment prior to placement of top course asphaltic concrete.
- G. The Contractor shall submit to the Engineer, one (1) copy of each certified weight slip received for all asphaltic concrete delivered and utilized on the project.
- H. The Owner expressly reserves the right to eliminate any or all items of this Section from the Contract and to accomplish such work by other means at its discretion, and the Contractor shall do only such work as may be ordered by the Owner.
- I. Maintain asphaltic concrete under this Contract during the guarantee period of one (1) year. Promptly refill and repave all areas which have settled or are otherwise unsatisfactory for traffic.

### 3.4 TEMPORARY PAVEMENT

- A. Contractor to provide a 3-inch compacted depth temporary pavement in trenches, after completing trench backfill and compaction including process gravel sub-base at the end of each week.
- B. Contractor to provide a 3-inch compacted depth temporary pavement in pits, after completing trench backfill and compaction including process gravel sub-base that have been backfilled.

### 3.5 PLACEMENT OF PERMANENT ASPHALTIC CONCRETE PAVING: Rt 9 Trenches

- A. Permanent Trench Resurfacing: After a minimum of 90 days after temporary pavement installation or one winter season, Contractor to remove temporary pavement and install permanent trench pavement.
1. Edges of the trenches shall be cut back in a neat true line, 12 inches outside all limits of the excavation with a water cooled abrasive saw.
  2. Process gravel shall be removed to the appropriate depth and compacted.
  3. Edges of the existing pavement shall be brushed clean and the specified tack coat applied.
  4. Pavement shall be placed as follows
    - a. Install Binder Course asphaltic concrete paving to a compacted thickness of 4 inches,
    - b. Install Top Course asphaltic concrete paving to a compacted thickness of 3 inches (two lifts of 1-1/2").
  5. The equipment used for spreading and finishing shall be a mechanical self-powered paver capable for spreading and finishing the mixture true to line, grade, width and crown by means of fully automated controls for both longitudinal and transverse slope.
  - 6.
  7. Compaction shall be accomplished with a self-propelled roller with a weight of approximately 285 lbs. per inch of roller width.
  8. Tack coat shall be applied in conformance with Section 460.62 of the Massachusetts Highway Department Standard Specifications to all existing pavement edges prior to each course of trench pavement installation.
  9. Existing castings to be adjusted to final grade.
  10. Trench binder course resurfacing shall be maintained by the Contractor until permanent top course resurfacing is placed.
  11. Where trench base course paving is at the edge of the traveled way, gravel backup material shall be installed to prevent damage to the new edges.
- B. Joint and Crack Seal
1. The butt edges of all permanent resurfacing shall be sealed with a 6-inch wide continuous strip of joint and crack sealer as specified and completely covered with sand.

### 3.6 PLACEMENT OF PERMANENT ASPHALTIC CONCRETE PAVING: Rt 9 & Rt 27 Pits

- A. Permanent Pit Resurfacing: Contractor shall remove temporary and/or existing pavement in the pits and install permanent trench base course pavement.
1. Edges of trenches shall be cut back in a neat true line, 12 inches outside all limits of the excavation with a water cooled abrasive saw.

2. Edges of the existing pavement shall be brushed clean and the specified tack coat applied.
3. Pavement shall be placed as follows
  - a. Install Base Course asphaltic concrete paving to a compacted thickness of 4 inches.
  - b. Install Top Course asphaltic concrete paving to a compacted thickness of 3 inches, in two courses.
4. The equipment used for spreading and finishing shall be a mechanical self-powered paver capable for spreading and finishing the mixture true to line, grade, width and crown by means of fully automated controls for both longitudinal and transverse slope.
5. Compaction shall be accomplished with a self-propelled roller with a weight of approximately 285 lbs. per inch of roller width.
6. Tack coat shall be applied in conformance with Section 460.62 of the Massachusetts Highway Department Standard Specifications to all existing pavement edges prior to trench pavement installation.
7. Existing castings to be adjusted to final grade.
8. Trench base and binder course resurfacing shall be maintained by the Contractor until permanent top course resurfacing is placed.
9. Where trench base course paving is at the edge of the traveled way, gravel backup material shall be installed to prevent damage to the new edges.

B. Sand Seal

1. The butt edges and keyway joints of all permanent resurfacing shall be sealed with a six (6) inch wide continuous strip of RS-1 completely covered with sand.

### 3.7 PLACEMENT OF FULL WIDTH ROADWAY OVERLAY PAVEMENT: Rt 135

- A. Permanent Full Road width Overlay Resurfacing: After one winter season with the permanent trench pavement, Contractor shall cold plane the full road width where identified to a depth of 1 -1/2" and install permanent trench top pavement.
1. This work shall be completed before the Boston Marathon in April.
  2. The roadway surface shall be cold planed to a depth of 1 ½-inches. The edge to edge width of the paved surface to be cold planed and extend 2-feet beyond Sta 0+00 and beyond the last water service trench, unless specified otherwise on the Drawings or in the Specifications.
  3. Edges around roadway structures shall be cold planed using a smaller machine designed for this use.
  4. If during the cold plane operation, bare spots (road base gravel) are revealed, the Contractor shall cut out these areas to a depth of 6-inches, then 3-inches of compacted base and 3-inches of compacted binder shall be installed to make-up for the deficits.
  5. The finished cold planed, trimmed and repaired surfaces shall be swept clean of all debris immediately after cold plane work and again just prior to resurfacing. Leaves must be continuously cleaned off the surface prior to installing the finished course.
  6. In all cold planning sections, all casting or roadway structures shall be raised and adjusted to the new finished roadway surface, where necessary.

7. Apply a full width tack coat with a trailer mounted spray applicator on all existing pavement prior to overlay paving and top course paving in pulverized section. No drizzling from tack containers will be allowed.
8. Tack coat shall be applied in conformance with Section 460.62 of the Massachusetts Highway Department Standard Specifications to all existing pavement edges and cold plane surfaces prior to pavement installation. At a minimum, tack coat shall be applied full width of surface receiving pavement at the rate of 0.25 gallons per square yard. The contact surfaces of curbs, castings and other structures shall be painted with a tack coat.
9. Pavement shall be placed as follows
  - a. Install Top Course asphaltic concrete paving to a compacted thickness of 1 ½ inches,
10. The equipment used for spreading and finishing shall be a mechanical self-powered paver capable for spreading and finishing the mixture true to line, grade, width and crown by means of fully automated controls for both longitudinal and transverse slope.
11. Compaction shall be accomplished with a self-propelled roller with a weight of approximately 285 lbs. per inch of roller width.

B. Joint and Crack Seal

1. The butt edges of all permanent resurfacing shall be sealed with a 6-inch wide continuous strip of joint and crack sealer as specified and completely covered with sand.

### 3.8 PLACEMENT OF PERMANENT ASPHALTIC CONCRETE PAVING: Bacon Street & Rt 135 (Wellesley) Pits

A. Permanent Pits Resurfacing: After one winter season, Contractor shall remove temporary pavement and install permanent trench pavement.

1. Edges of the North Main Street trenches and pits shall be cut back in a neat true line, 12 inches outside all limits of the excavation with a water cooled abrasive saw.
2. Process gravel sub-base shall be removed to the proper depth and compacted.
3. Edges of the existing pavement shall be brushed clean and the specified tack coat applied.
4. Pavement shall be placed as follows
  - a. Install Binder Course asphaltic concrete paving to a compacted thickness of 3 inches,
  - b. Install Top Course asphaltic concrete paving to a compacted thickness of 1 ½ inches.
5. The equipment used for spreading and finishing shall be a mechanical self-powered paver capable for spreading and finishing the mixture true to line, grade, width and crown by means of fully automated controls for both longitudinal and transverse slope.
6. Compaction shall be accomplished with a self-propelled roller with a weight of approximately 285 lbs. per inch of roller width.

7. Tack coat shall be applied in conformance with Section 460.62 of the Massachusetts Highway Department Standard Specifications to all existing pavement edges prior to trench pavement installation. At a minimum, tack coat shall be applied full width of surface receiving pavement at the rate of 0.25 gallons per square yard. The contact surfaces of curbings, castings and other structures shall be painted with a tack coat.
8. Existing castings to be adjusted to final grade.
9. Trench base and binder course resurfacing shall be maintained by the Contractor until permanent top course resurfacing is placed.
10. Where trench base course paving is at the edge of the traveled way, gravel backup material shall be installed to prevent damage to the new edges.

### 3.9 UNACCEPTABLE CASTING ADJUSTMENTS

- A. Any structures or castings which are not flush with the new finished roadway top course pavement surface shall be cutout re-leveled, resurfaced and infrared heat treated to make an invisible patch.

### 3.10 CASTING ADJUSTMENTS

- A. See Section 02579 Casting Adjustment

### 3.11 BERMS

- A. Existing bituminous berms or curbs specified below:
  1. Berms shall be Class I asphaltic concrete Type I-1 in accordance with the details of design as shown and specified in the Contract Documents.
  2. A level bituminous base course at least 2 inches in thickness shall be provided prior to the installation of the berm.
  3. The mixture shall be placed and compacted with a machine acceptable and approved by the Engineer for the type of berm required. Forming berm by hand shall not be allowed.

### 3.12 DUST CONTROL TREATMENT

- A. Calcium chloride shall be applied only upon the direction of the Engineer.
  1. The roadway shall be swept clean and calcium chloride spread at a uniform rate over the gravel trench surface.

### 3.13 PAVEMENT MARKINGS

- A. Pavement markings shall be applied to replace damaged or removed sections or at locations directed by the Engineer.
- B. The following is a general listing of pavement markings and locations.
  1. East Central Street includes the following markings
    - a. White fog lines - both sides of roadway,
    - b. Double yellow line middle of roadway

2. Route 9 includes the following markings
  - a. White Fog lines both side of road,
- C. The following procedures shall be followed for application of pavement markings.
  1. Pavement shall have been in place 48 hours prior to the application of pavement markings.
  2. The surface shall be prepared to accept the application in compliance with the paint manufacturer's requirements.
  3. Shall be applied to a dry film thickness of 15-mils.
  4. The temperature of the pavement shall be between 40°F and 120°F.
  5. No thinners are to be used for the pavement markings.
  6. The equipment used for the application of Pavement Markings, shall be of standard commercial manufacture. All other equipment and devices necessary for the application of Pavement Markings and protection thereof and for the protection of the traveling public, shall be as usually required for work of this type, and shall be furnished by the Contractor.
  7. Pavement markings shall be either a single or double continuous line or broken line, 4 inches wide as directed by the Engineer.
  8. If for any reason material is spilled or tracked on the pavement or any markings applied by the Contractor in the Engineer's judgment fail to conform 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 the pavement markings.

END OF SECTION

## SECTION 02514

### GRANITE CURBSTONE

#### PART 1 - GENERAL

##### 1.1 DESCRIPTION

- A. Work Includes: Remove and reset granite curbstone and install curb inlets as required by the Contract Documents.
- B. Related Work:
  - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.
  - 2. Section 02513 Asphaltic Concrete Paving
  - 3. Section 02726 Frames and Covers/Grates
  - 4. Section 03300 Cast-in-Place Concrete

##### 1.2 QUALITY ASSURANCE

- A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.
- B. Comply with pertinent provisions of the following except as may be modified herein.
  - 1. Department of Public Works, Standard Specifications, for Highways and Bridges of the Commonwealth of Massachusetts latest edition, including all addenda.
- C. The Contractor shall conduct all work in a first-class workmanlike manner, and he/she shall use reasonable and appropriate care and skill in the performance of the work under this Section.

##### 1.3 SUBMITTALS

- A. None required.

##### 1.4 PRODUCT HANDLING

- A. Comply with pertinent provisions of Section 01610.

## PART 2 - PRODUCTS

### 2.1 GRANITE CURBING

- A. The intention is to utilize the existing granite curb stones and curb inlets removed during the project for re-installation. If the curb is broken prior to the work of the contractor then a new curb stone shall be provided. Costs associated with furnishing a new curb stone will be considered under a change order.
- B. If a stone must be replaced it shall be a granite curb stone meeting the Mass Highway Standard, six (6)-feet in length, eighteen (18)-inches in depth, and at least 6-inches wide at the top and bottom.
- C. Curb inlets, if required to be replaced, shall be Mass Highway Standard with the following attributes:
  - 1. A gutter mouth at least three (3)-inches in depth and at least two (2)-feet in length shall be cut in the front face of the stone.
  - 2. Granite curb inlets shall match the adjacent curbing in color.
  - 3. Curbs shall be six (6)-feet in length, eighteen (18)-inches in depth, six (6)-inches wide at top and at least six (6)-inches wide at bottom.
- D. Returns shall be vertical curbing cut on a two (2)-foot radius with a six (6)-inch width. Returns shall be placed at each end of the granite curbing installation.

## PART 3 - EXECUTION

### 3.1 REMOVAL OF EXISTING GRANITE CURBSTONE

- A. Existing granite curbstone shall be removed and placed in an area directed by the Owner.
  - 1. If they are stacked, wood blocking shall be placed between them.
  - 2. Granite curbing which is damaged by the Contractor shall be replaced with new granite curbstone of the same quality and appearance at the Contractor's expense.

### 3.2 INSTALLATION OF GRANITE CURBSTONE

- A. Curbing shall be aligned within roadway gutter as shown on the Drawings.
  - 1. Joints shall be grouted.
  - 2. Concrete shall be placed against curbside of the curbing up to bottom of pavement area.
  - 3. Backside of curbing shall be backfilled with bank gravel as specified in Section 02221.
  - 4. Any curbing which settles or is not in alignment with curbing which was not reset shall be removed and reinstalled.

### 3.3 INSTALLATION OF GRANITE CURB INLETS

- A. Proposed granite curb inlets shall be aligned horizontally and vertically with existing curbing.
  - 1. Trench for curb shall be excavated to a width of eighteen (18)-inches, and a depth of six (6)-inches below the bottom of the curbstone.
  - 2. Foundation for curb inlet shall consist of a full bed of cement mortar on the supporting back wall of the catch basin and a minimum of six (6)-inches of compacted gravel on each side to support the overhang.
  - 3. Backside of curbing shall be backfilled with select borrow as specified in Section 02221.

END OF SECTION

## SECTION 02610

### DUCTILE IRON PIPE, FITTINGS, AND APPURTENANCES

#### PART 1 - GENERAL

##### 1.1 DESCRIPTION

- A. Work Included: Provide all ductile iron pipe, fittings, and appurtenances for water mains as required by the Contract Documents.
- B. Related Work:
  - 1. Documents affecting work of this section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.
  - 2. Section 02221 Trenching, Excavation and Backfilling
  - 3. Section 02640 Valves and Service Brass

##### 1.2 QUALITY ASSURANCE

- A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the Work of this Section.
- B. The Contractor shall conduct all work in a first-class workmanlike manner, and he/she shall use reasonable and appropriate care and skill in the performance of the Work under this Section.

##### 1.3 SUBMITTALS

- A. Comply with pertinent provisions of Section 01340.
- B. Product Data: Within twenty (20) calendar days after the Contractor has received the Owner's Notice to Proceed, submit:
  - 1. Materials list of items proposed to be provided under this Section
  - 2. Manufacturer's specifications and other data needed to provide compliance with the specified requirements.

##### 1.4 PRODUCT HANDLING

- A. Comply with pertinent provisions of Section 01610.
  - 1. Material shall be handled so as to avoid damage, with particular attention being given to loading, transporting, and unloading pipe and accessories. Under no circumstances shall pipe or accessories be unloaded by dumping or dropping onto the ground or stockpile. All material shall be lowered by ropes, chains, tongs, derricks, or other suitable equipment.

2. Pipe shall not be stored on private property without consent of the property owner, and all pipe shall be properly braced and clocked to prevent injury due to rolling or collapse of pipe.

## PART 2 - PRODUCTS

### 2.1 DUCTILE IRON PIPE

#### A. Ductile Iron Water Main

1. Shall be Class 52 with push on joint meeting the requirements of ANSI/AWWA C151/A21.51-17 or latest revisions thereto.
2. All water main pipe shall be double cement lined, with an asphaltic seal coat meeting the requirements of ANSI/AWWA C104/A21.4-16 or latest revision thereto.
3. All forcemain pipe interior shall be double cement lined with an asphaltic seal coat, with the exception of the last twenty (20) linear feet from the proposed transition sewer manhole, with an asphaltic seal coat meeting the requirements of ANSI/AWWA C104/A21.4-16 or latest revision thereto.
4. The interior surfaces of the last twenty feet (20ft) of the forcemain pipe prior to the sewer manhole, shall be fusion-bonded epoxy coated in accordance with ANSI/AWWA C116., equal to Protecto 401 Ceramic Epoxy Lining by American Pipe.
5. Pipe exterior shall be coated with an approved asphaltic coating, approximately 1-mil in thickness, meeting the requirements of ANSI/AWWA C151/A21.51-17 or latest revision thereto.
6. Rubber gasketed joint shall meet the requirements of ANSI/AWWA C111/A21.11-17 or latest revisions thereto.

### 2.2 FITTINGS

#### A. Ductile Iron Water Main

1. Fitting shall be manufactured of ductile iron mechanical joint, all bell, compact design rated for 350 psi.
2. All fittings, with the exception of the bends prior to the forcemain transition sewer manhole, shall include cement mortar lining and seal coat, and exterior shall be asphalt coated in accordance with ANSI/AWWA C153/A21.53-11 or latest revision thereto.
3. The forcemain bends between the sliplining pit (south side of Route 9) and the transition sewer manhole and inside the sewer manhole shall include an exterior asphalt coating in accordance with ANSI/AWWA C153/A21.53-11 or latest revision thereto and the interior shall have a fusion-bonded epoxy coated in accordance with ANSI/AWWA C116, equal to Protecto 401 Ceramic Epoxy Lining by American Pipe.
4. Fittings that are not presently manufactured to the compact design, but are manufactured to meet or exceed the requirements of ANSI/AWWA C110/A21.10-12 or latest revision thereto may be utilized.

5. Mechanical joint shall meet or exceed the requirements of ANSI/AWWA C111/A21.11-17 or latest revision thereto.
6. Mechanical joints shall include retainer gland equal to Megalug.

## 2.3 SPECIAL FITTINGS

- A. All fittings to have retainer glands equal to "Sigma One Lok", Sigma Corporation, Megalug or approved equal.
- B. Solid sleeves shall be ductile iron with mechanical joint, long body style meeting or exceeding the requirements of ANSI/AWWA C110/A21.10-12 or latest revision thereto.
  1. Solid sleeves shall be a minimum of 12 inches in length.
  2. A fully restrained coupling may be substituted for solid sleeves in use with oversized or cast iron pipe.
  3. Sleeves or couplings without integrated restraint shall not be considered.
- C. Alternate to solid sleeve, if cast iron od does not allow use of solid sleeve shall be an ALPHA restraint joint coupling by ROMAC Industries.

## PART 3 - EXECUTION

### 3.1 SURFACE CONDITIONS

- A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

### 3.2 FIELD MEASUREMENTS

- A. Make necessary measurements in the field to assure precise fit of items.

### 3.3 INSTALLATION

- A. Trench, backfill and compact for the Work of this Section in strict accordance with pertinent provisions of Section 02221 of these Specifications.
- B. Protect pipe and fittings during handling against shocks and free fall. Remove extraneous material from the pipe and fitting interior.

### 3.4 PIPE LAYING

- A. Ductile Iron Pipe and Fittings
  1. Lay ductile iron pipe and fittings in accordance with the requirements of ANSI/AWWA C600-17 except as may be otherwise provided in this Specification.
  2. Pipe cutting shall be done by machine, leaving a smooth cut at right angles to the axis of the pipe and the cement lining shall be undamaged.

3. All bends, tees, caps, plugs, and hydrants shall be provided with reaction or thrust blocking and retainer glands.
4. When pipe laying is not in progress, the open end of the pipe(s) shall be closed by a suitable pipe cap or plug to prevent the entry of dirt, stones or ground water into the line.
5. The cut end of a pipe which is being made-up into a push-on-joint shall have its cut end beveled to prevent damage to the gasket during assembly of the joint.
6. Install retainer glands where specified in this Section and where shown on the Contract Drawings in accordance with the manufacturer's recommended installation instructions.

B. Connections at Existing Water Mains

1. The exact location and size of the existing water mains shall be determined by test pit excavations as directed by the Engineer.
2. Once uncovered, the Contractor shall prepare the pipe for the proposed connection. Care shall be taken in alignment of the new piping and fittings, to keep deflection within the manufacturer's allowable tolerances.
3. Couplings shall be utilized for connecting new pipe to existing.

### 3.5 PIPE AND FITTING JOINT ASSEMBLY

A. Mechanical Joints

1. Megalug retainer glands are to be installed on all mechanical joints.
2. Clean pipe end and socket, and apply a soapy water solution or lubricant as provided by the pipe manufacturer.
3. Place gland on plain end with lip extension toward plain end, followed by gasket with narrow side toward plain end.
4. Insert pipe into socket and press gasket firmly and evenly into gasket recess.
5. Push gland toward socket and center, installing bolts and nuts hand tight.
6. Align pipe at this time, taking care to keep deflection within 5% of the pipe length or per manufacturer's recommendations, whichever is less.
7. Tighten bolts in alternating sequence utilizing a torque wrench, maintaining the same distance between the gland and face of flange during the process.
8. Torque bolts to a range of 75 to 90 foot-pounds.

B. Push-on Joints

1. Thoroughly clean groove and bell socket of pipe and fitting, along with plain end of mating pipe.
2. Make a small loop in gasket and insert into socket, making sure the gasket faces the correct direction.
3. Apply a lubricant to plain end of pipe and gasket, provided by pipe manufacturer and applied as per manufacturer's recommendations.
4. Push beveled plain end of pipe into bell, keeping pipe straight during installation and making deflection after insertion to complete.
5. Maintain deflection within 5% of the pipe length or per manufacturer's recommendations, whichever is less.

### 3.6 FLUSHING

- A. All sections of piping installed shall be flushed prior to pressure testing by partially opening and closing valves and hydrants several times under expected line pressure, with flow velocities adequate to flush foreign material from valves and hydrants.

### 3.7 HYDROSTATIC TESTING- WATER MAIN

- A. Pressure Test: Hydrostatic testing shall be in compliance with ANSI/AWWA C600-17 or latest revision thereto. After the pipe has been installed, pipe or any valved section thereof shall be subject to a hydrostatic pressure of at least 1.5 times the working pressure, at the point of testing.
  - 1. Pressure shall not be less than 1.25 times the working pressure at the highest point along the test section and not less than 1.5 times the working pressure at the lowest elevation of the test section.
  - 2. Test shall not be made until all reaction and thrust blocking has achieved their strength, a minimum of seven (7) days after they were cast.
  - 3. Duration of test shall be two (2) hours.
  - 4. Test pressure shall not vary by more than  $\pm 5$  psi.
  - 5. Each section of pipeline shall be slowly filled with water, with the specified test pressure, measured at the point of lowest elevation, applied by means of a pump connection to the pipe in a manner satisfactory to the Engineer. The pump, pipe connection, gauges, and all necessary apparatus shall be furnished by the Contractor.
  - 6. During the filling of the pipe and before applying the specified test pressure, all air shall be expelled from the pipeline. At all points of high elevation, the Contractor shall install corporation cocks so that air can be expelled as the pipe is filled with water. After all air has been expelled, the corporation cocks shall be closed and the test pressure applied. At the conclusion of the pressure test, the corporation cocks shall be removed and plugged or left in place at the discretion of the Owner.
- B. Leakage Test: Leakage shall be defined as the quantity of water that must be supplied into the pipe to maintain pressure within  $\pm 5$  psi of the specified test pressure after the air has been expelled and the pipe filled with water. Leakage shall not be measured by a drop in pressure in a test section over a period of time.
  - 1. No pipe installation shall be accepted if the leakage is greater than that determined by the following formula:  
$$L = (S * D * P^{0.5}) / 148,000$$

where: L = allowable leakage, in gallons per hour.  
S = the length of pipe tested, in feet.  
D = the nominal diameter of the pipe, in inches.  
P = the average test pressure during the leakage test, in psi.
  - 2. Should any test of a section of pipe line disclose leakage greater than permitted, the Contractor shall at his own expense locate and repair the defects until repeated pressure test yields a leakage value within the allowable limit.
  - 3. The Contractor shall provide the Engineer with a written report on the pressure test, to include the date, time, location, stations, pressure, quantity of water applied during test, size of pipe, etc.

- C. Notification: The Engineer and the Owner shall be notified, in writing, at least 48 hours prior to the hydrostatic testing of the pipeline.

### 3.8 DISINFECTION – WATER MAINS

- A. Disinfection and sampling shall be in compliance with ANSI/AWWA 651-14 or latest revision thereto. The pipelines shall be disinfected by application of chlorine either as calcium hypochlorite or liquid sodium hypochlorite in an amount to produce a solution of 25 p.p.m., for a contact period of 24 hours, and afterward, flushed until the chlorine residual is reduced to system residual. Chlorine dosage shall be applied by pumping into the line to be treated, a sufficient amount of chlorine solution, which, when mixed with water in the pipeline, will meet the required concentration. The mixture shall be pumped through the section being treated and shall be discharged and monitored at a point farthest from the point of introduction of the chlorine. When the solution reaches the required concentration of 25 p.p.m., the pump and discharge valve shall be closed and the liquid left in the section being chlorinated for 24 hours.
1. The chlorine solution used for disinfecting the new water line shall be discharged from the water main and into a tanker truck, where the solution may be neutralized and then properly disposed of.
  2. Alternatively, a chlorine neutralizer can be utilized on the hydrant discharge for discharging to the ground surface, provided the chlorine residual leaving the diffuser is at or below water system chlorine residual.
  3. If a hydrant connection is not available to be used for discharging the chlorine solution from the new line, a temporary blow-off connection shall be installed for that purpose. Upon completion of the disinfection process, the blow-off connection shall be removed.
  4. The Contractor shall furnish all materials and equipment for the sterilization of the mains, but the Water Department will furnish necessary assistance in flushing and the operation of gate valves.
  5. The Contractor shall obtain a water sample from the disinfected line and analyze for coliform bacteria and HPC and Background bacteria.
    - a. Sample bottles shall be obtained from a State DEP approved laboratory.
    - b. Samples shall be collected and analyzed in accordance with the applicable AWWA standard.
    - c. Two samples for each section of main tested shall be taken. The first sample taken 16-24 hours after the chlorine was flushed from the water main. The second shall be taken 16-24 hours after the first sample.
    - d. Collected samples are to be immediately delivered to the laboratory for analysis for Coliform Bacteria, Background bacteria and Heterotrophic Plate Count (HPC).
    - e. A copy of the laboratory report shall be submitted to the Engineer.
    - f. If the analysis indicates the presence of coliform bacteria, the water main shall be disinfected again and the analysis repeated.
    - g. If the analysis indicates no coliform bacteria but HPC or Background bacteria is greater than 500, then the Contractor has the option of flushing and resampling or repeating the disinfection process and resampling.

- h. The process shall be repeated until the analysis indicates no coliform bacteria and HPC & Background are below 500 count.

END OF SECTION

SECTION 02611  
SERVICE TUBING

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Work Included: Furnish and install service tubing as required by the Contract Documents.
- B. Related Work:
  - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.
  - 2. Section 02221 Trenching, Backfilling, and Compaction
  - 3. Section 02640 Valves and Service Brass

1.2 QUALITY ASSURANCE

- A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the Work of this Section.
- B. Use equipment adequate in size, capacity, and numbers to accomplish the Work of this Section in a timely manner.
- C. In addition to complying with requirements of governmental agencies having jurisdiction, comply with the directions of the Engineer.
- D. The Contractor shall conduct all work in a first-class workmanlike manner, and he/she shall use reasonable and appropriate care and skill in the performance of the Work under this Section.

1.3 SUBMITTALS

- A. Comply with pertinent provisions of Section 01340.
- B. Product Data: Within fifteen (15) calendar days after the Contractor has received the Owner's Notice to Proceed, submit:
  - 1. Materials list of items proposed to be provided under this Section.
  - 2. Manufacturer's specifications and other data needed to prove compliance with the specified requirements.

1.4 PRODUCT HANDLING

- A. Comply with pertinent provisions of Section 01610.

## PART 2 - PRODUCTS

### 2.1 SERVICE TUBING

- A. Service tubing shall be blue, polyethylene (PE) 4710 water tubing, pressure class 250 psi. Tubing shall meet or exceed the requirements for ASTM D2737 and ANSI/AWWA C901-08, or latest revisions thereto, and be NSF/ANSI 61 certified. Shall be Ultra-Pure Blue 4710 CTS SDR 9 tubing as manufactured by Silver-Line Plastics, or approved equal.
- B. Services shall match existing service diameter, but have a minimum of 1-inch in diameter.
- C. Stainless steel inserts shall be used with the tubing at all joints.
- D. Fittings shall be compression joint type on inlet and outlet.

### 2.2 INSULATION

- A. Provide 2-inch closed cell polystyrene, as manufactured by Dow ('Blue Styrofoam') as directed by Owner, if determined to be necessary due to bury depth, following excavation of service. All butt joint seams shall be overlapped with 2-inch piece of insulation over seam.

## PART 3 - EXECUTION

### 3.1 SURFACE CONDITIONS

- A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

### 3.2 FIELD MEASUREMENTS

- A. Make necessary measurements in the field to assure precise fit of items.

### 3.3 INSTALLATION

- A. Excavation, backfill, and compaction for the Work of this Section in strict accordance with pertinent provisions of Section 02221.

### 3.4 PIPE LAYING

- A. Temporary water service
  - 1. If in the opinion of the property owner, water service downtime required to replace water service requires a temporary water service to the building, especially on the 10" cast iron main side of the road, then contractor to setup temporary service and make all arrangements with property owner.

2. Contactor to work with each property owner to minimize water service downtime and to select appropriate time of day to make water service connections.

B. Service Tubing Open Cut Construction

1. Provide new service through open cut excavation where trenchless method was not successful.
2. The tubing shall be connected to the new corporation and the compression joint tightened.
3. Contractor to install a 2" diameter PVC pipe to act as a sleeve across the road, starting 3 feet from corporation and ending 3 feet prior to curb stop. Trench across road shall be backfilled prior to pulling the service to reduce time trenches are open in West Central Street.
4. Tubing shall be carefully inserted in sleeve. Care shall be taken to insure against kinks or crushed areas.
5. Backfill around and to 1 foot over pipe at main and curb stop shall not contain stones greater than 1-inch diameter.
6. Existing corporation shall be closed and unused existing tubing removed.
7. Tubing shall be connected to the new service curb stop and corporation.
8. Contractor to install a short length of new tubing from the new curb stop for connection to existing service, utilize a 1-inch x 3/4-inch reducer if necessary, and compression joints tightened.

3.5 SERVICE ACTIVATION

- A. Prior to changing new service line, Contractor shall notify Water Department to have Water Department employees on site to remove water meter in dwelling and flush new service line to prevent plugging of meter and strainers.

END OF SECTION

## SECTION 02640

### VALVES AND SERVICE BRASS

#### PART 1 - GENERAL

##### 1.1 DESCRIPTION

- A. Work Included: Furnish and install valves on the water distribution piping system as specified in this Section and as shown on the Contract Drawings.
- B. Related Work:
  - 1. Documents affecting work of this Section include, but are not limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of the Specifications.

##### 1.2 QUALITY ASSURANCE

- A. Use adequate numbers of skilled workers who are trained and experienced in the crafts and who are familiar with the specified requirements and the methods needed for performance of the Work.
- B. The Contractor shall conduct all work in a first-class workmanlike manner, and he/she shall use reasonable and appropriate care and skill in the performance of the Work under this Section.

##### 1.3 SUBMITTALS

- A. Comply with pertinent provisions of Section 01340.
- B. Product Data: Within twenty (20) calendar days after the Contractor has received the Owner's Notice to Proceed, submit:
  - 1. Materials list of items proposed to be provided under this Section;
  - 2. Manufacturer's specifications and other data needed to provide compliance with the specified requirements.

##### 1.4 PRODUCT HANDLING

- A. Comply with pertinent provisions of Section 01610.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

#### A. Gate Valves for Buried Service

1. Gate valves on all water mains and hydrant branches 16 inches or less in diameter shall be of the resilient seated wedge type with ductile iron body.
2. Shall meet or exceed the requirements of ANSI/AWWA C515 or latest revision thereto.
3. Ends shall be mechanical joint conforming to ANSI/AWWA C111/A21.17 or latest revision thereto.
4. Valve shall be of the non-rising stem type with O-ring stem seals.
5. Shall have a 2-inch square operating nut and shall turn clockwise (right) to open.
6. Valves shall be rated for 350 psi maximum working pressure and 700 psi static pressure test.
7. Shall be fully coated on interior and exterior surfaces in accordance with AWWA C550, with a minimum dry film thickness of 10 mils; up to 60 mils for epoxy-resin coatings.
8. Tapping valve and sleeve specified in Section 02610 Ductile Iron Pipe, Fittings, and Appurtenances.
9. Valves shall be as manufactured by Waterhouse, Mueller model A-2361-20.
10. All exterior nuts and bolts shall be stainless steel with 5/8-inch minimum diameter.

#### B. Valve Boxes

1. Shall be cast iron with a cast iron cover. The word "water" shall be cast into the cover in raised letters.
2. Valve box barrel shall not be less than 5-1/4 inches in diameter.
3. Shall be two-piece sliding type, providing a minimum overlap of 6 inches.
4. The lower section shall enclose the operating nut and stuffing box of the valve.
5. The valve box shall not transmit shock or stress to the valve.

#### C. Corporation Stops

1. Service corporation stops shall be 1-inch or 2-inch in size (unless otherwise directed), constructed of "no lead" or "lead free" alloy brass and meeting or exceeding the latest requirements of ANSI/AWWA C800-14 or latest revisions thereto. Outlet connections shall be suitable for CTS O.D. polyethylene service tubing. Corporation shall be H-15008 as manufactured by Mueller Co., or approved equal.
2. All corporation stops shall have the manufacturer's name or trademark integrally stamped or cast on it. Anchor marking identifying the "no lead" brass alloy shall be cast or stamped on the corporation.

#### D. Curb Stops

1. Curb stops shall be 1-inch or 2-inch in size (unless directed otherwise), shall turn clockwise (right) to open, shall be constructed of “no lead” or “lead free” alloy brass (including drain), and meeting or exceeding the latest requirement of ANSI-AWWA C800-14, or latest revisions thereto. Curb stop shall be suitable for CTS O.D. polyethylene service tubing connections at both ends. Curb stops shall be H-15209N as manufactured by Mueller Co., or approved equal.
  2. All curb stops shall have the manufacturer’s name or trademark integrally stamped or cast on it. Anchor marking identifying the “no lead” brass alloy shall be cast or stamped on the curb stop.
- E. Fittings
1. 1-inch and 2-inch fittings shall be constructed of “no lead” or “lead free” alloy brass with compression joints. Reducer bushings shall be compression by thread style, typically 1-inch by ¾-inch.
  2. Shall meet or exceed the latest requirement of ANSI-AWWA C800-14, or latest revisions thereto.
- F. Curb Boxes
1. Shall be Buffalo-type recessed lid with pentagon bolt, adjustable sliding type for 5-foot bury, and of USA manufacture.
  2. Service box shall include a rod and a centering rod guide or ring.

## PART 3 - EXECUTION

### 3.1 SURFACE CONDITIONS

- A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

### 3.2 FIELD MEASUREMENTS

- A. Make necessary measurements in the field to assure precise fit of items.

### 3.3 INSTALLATION

- A. Excavation, backfill, and compaction for the Work of this Section in strict accordance with pertinent provisions of these Specifications.
- B. Gate Valves: Shall be set and aligned plumb, supported by a flat stone or solid concrete block, with mechanical joint tightened. Backfill shall be carefully placed and compacted to prevent movement of valve.
1. Valve box shall be set plumb and centered over operating nut, and supported in this position during backfilling and compaction.
  2. Box shall be set initially flush with the temporary surface and again adjusted just prior to placement of the base course of asphaltic concrete with a concrete collar.

3. Prior to placement of the final top course of asphaltic concrete, the box shall be cleaned of all debris and checked for plumb and centering over operating nut.
  - a. If out of plumb, box shall be excavated and reset to plumb.

END OF SECTION

## SECTION 02645

### HYDRANTS

#### PART 1 - GENERAL

##### 1.1 DESCRIPTION

- A. Work Included:
  - 1. Furnish and install hydrants where shown on the Contract Documents.
  - 2. Furnish an additional twelve (12) hydrants, delivered to the Owner's Department of Public Works gravel yard on Oak Street for future use.
- B. Related Work:
  - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Divisions 1, 2 and 3 of these Specifications.
  - 2. Section 02221 Trenching, Backfilling, and Compacting
  - 3. Section 02610 Ductile Iron Pipe, Fittings, and Appurtenances

##### 1.2 QUALITY ASSURANCE

- A. Use adequate numbers of skilled workers who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the Work of this Section.
- B. Use equipment adequate in size, capacity, and numbers to accomplish the Work of this Section in a timely manner.
- C. In addition to complying with requirements of governmental agencies having jurisdiction, comply with the directions of the Engineer.
- D. The Contractor shall conduct all work in a first-class workmanlike manner, and he/she shall use reasonable and appropriate care and skill in the performance of the Work under this Section.

##### 1.3 SUBMITTALS

- A. Comply with pertinent provisions of Section 01340.
- B. Product Data: Within fifteen (15) calendar days after the Contractor has received the Owner's Notice to Proceed, submit:
  - 1. Materials list of items proposed to be provided under this Section.
  - 2. Manufacturer's specifications and other data needed to provide compliance with the specified requirements.

## 1.4 PRODUCT HANDLING

- A. Comply with pertinent provisions of Section 01610.

## PART 2 - PRODUCTS

### 2.1 HYDRANTS

- A. Hydrants shall meet or exceed the requirements of ANSI/AWWA C502-14 or latest revision thereto, and shall be equal to Mueller Super Centurion model , or approved equal.
1. Barrel sections shall be 5-¼-inch diameter.
  2. Main valve shall be 5-¼-inch diameter.
  3. Two (2) 2-½-inch hose nozzles.
  4. One (1) 4-½-inch pumper outlet.
  5. Replaceable brass nozzles.
  6. Breakaway flange placed at ground level.
  7. Mechanical joint shoe.
  8. Open right (clockwise).
  9. Shall be designed for a 4-½-foot depth of bury.
  10. Hydrants shall be factory painted red.
  11. Hydrant shall be self-draining.
  12. Hydrants shall have a rated AWWA working pressure of 250 psig and shall close with the pressure. Prior to shipment, hydrants shall be tested at the point of manufacture at 500 psig. The pressure rating, manufacturer's name, point of manufacture and valve opening size shall be marked on the upper barrel.
  13. The manufacturer shall provide drawings and an affidavit of compliance of the specifications detailed herein.
  14. Hydrants shall have a 1-½-inch pentagon bronze operating nuts and 6-inch diameter mechanical joint inlet connection. Nozzles shall be retained by a ductile iron collar. Retention of the nozzle by set screws is not allowed. Caps shall be furnished with non-kink chains.
  15. All hydrant flange bolts and nuts shall be stainless steel. Bolts shall be metric . Hydrant bolting materials shall comply with the applicable portions of Section 4.11 of ANSI/AWWA C502 requiring compliance with ASME B18.2.1. All bolted connections shall be limited to one (1) nut for each bolt. Multiple nuts to achieve a connection with any single bolt will not be allowed.
  16. Hydrant shall be coated inside and out with a two-part epoxy coating. Upper hydrant barrel shall be coated with a polyurethane enamel over-coat. Lower hydrant barrel shall be coated with an asphalt varnish.
  17. Hydrants shall be supplied with a traffic break feature employing a two-part flange. Hydrants shall be provided with a compression-type rubber main valve that closes with water pressure for positive sealing. The bronze seat ring shall be threaded into mating bronze drain ring and able to be removed from above ground for easy field repair.
  18. Rod threads shall be lubricated such that the threads are bathed in an oil lubricant each time the hydrant is operated. Lubrication system shall be sealed with a minimum of two (2) O-rings to help prevent contact of the water by the lubricant.

## 2.2 HYDRANT EXTENSION

- A. Extension Kit: If required to meet grade on site.
  - 1. Shall be provided by the hydrant manufacturer.
  - 2. Length shall be as needed.
  - 3. To insure proper fit and tolerances, all extensions shall be manufactured by the original hydrant manufacturer. Aftermarket extensions and/or parts will not be allowed.

## PART 3 - EXECUTION

### 3.1 SURFACE CONDITIONS

- A. Examine the areas and condition under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

### 3.2 FIELD MEASUREMENTS

- A. Make necessary measurements in the field to assure precise fit of items.

### 3.3 PROPOSED HYDRANT LOCATIONS

- A. All new hydrant locations shown on the Contract Drawings shall be subject to field location approval by the Owner.
- B. Existing hydrants shall be removed and disposed of by the Contractor.

### 3.4 INSTALLATION

- A. Trench, backfill, and compaction for the Work of this Section in strict accordance with pertinent provisions of Section 02221 of these Specifications.
- B. The new hydrant branch shall generally be positioned near the sideline of the roadway layout, and in a location that is not vulnerable to traffic damage, and in a location where flushing can be performed without damage to adjacent property.
- C. The hydrant shall be set upon a flat stone or concrete plate.
- D. The hydrant drainage pit shall be approximately 3 feet in diameter and filled with compacted crushed stone. While backfilling, place additional crushed stone to at least 6 inches above the hydrant drain ports, as shown on the Contract Drawings.
- E. Thrust blocking shall be placed behind the shoe of the hydrants, taking care not to block the drain outlets.

- F. Joint restraints shall be used at all joints between the shut-off valve up to and including the hydrant.
- G. The hydrant shall be set plumb and to the proper grade and shall remain properly supported until it is backfilled.
- H. The Contractor shall provide hydrant extensions, if necessary, to meet grade.
- I. After the hydrant has been set, it shall be entirely draped with burlap and remain covered until the water distribution system has been accepted and put into service.

END OF SECTION

## SECTION 02765

### LINING CAST IRON PIPE

#### PART 1 - GENERAL

##### 1.1 DESCRIPTION

- A. For each section of main pipe to be cleaned and lined, the Contractor shall dewater the pipe; shall make all excavations as necessary to expose and open the main pipe and intermediate main line gates, including sheeting or shoring as necessary; cut and remove a portion of the piping system for access by approved means; support pipes and discharge tube with valve and containment for cleaning residue; line the cleaned pipe with cement mortar; replace gates, valves and fittings as shown or ordered by the Owner, clear all service and laterals of mortar and debris; reconnect all opened piping by approved means, and do all other work as necessary to clean and line the pipes in full accord with the Specifications.
- B. Related Work:
  - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.
  - 2. Section 02320 Pipeline Cleaning & Television Inspection
  - 3. Section 02766 Temporary Bypass Piping with Service Hoses

##### 1.2 QUALITY ASSURANCE

- A. Use adequate numbers of skilled workers who are thoroughly trained and experienced in cleaning and lining pipelines and who are completely familiar with the specific requirements and methods needed for performance of the Work of this Section.
- B. Use equipment adequate in size, capacity, and numbers to accomplish the Work of this Section in a timely manner.
- C. In addition to complying with requirements of governmental agencies having jurisdiction, comply with the directions of the Engineer.
- D. The Contractor shall conduct all work in a professional manner and he/she shall use reasonable and appropriate care and skill in the performance of the Work under this Section.

##### 1.3 SUBMITTALS

- A. Comply with pertinent provisions of Section 01340.
- B. Product Data: Within fifteen (15) calendar days after the Contractor has received the Owner's Notice to Proceed, submit:
  - 1. Description of piping material.
  - 2. Proposed timeline of when bypass piping is to be placed for the project phases.
  - 3. Proposed bypass layout plan with pipe sizes and temporary hydrants shown.

## PART 2 - PRODUCTS

### 2.1 CEMENT MORTAR LINING

- A. Shall conform to AWWA C602-95 standard or latest revisions thereto specified for Cement Mortar Lining of Water Pipelines – four (4) inch and larger, in place.
- B. Shall be subject to thorough inspection and test; failure to meet AWWA C602-95 may be cause for rejection of the whole from which the sample was taken.
- C. Prior to cleaning and lining the water main, the Contractor shall expose the main in order to determine if there is an existing cement lining. The Owner will then decide to either clean and line the main, only clean the main, or to do no work on the main.

### 2.2 MATERIALS

- A. Provide other materials not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the approval of the Engineer.

## PART 3 - EXECUTION

### 3.1 DEWATERING PIPES

- A. The Contractor shall dewater all pipe lines preparatory to the starting of the Work, drain all low spots, make all excavations at locations required to facilitate the Work, and take special precautions to prevent the possibility of any water entering the sections in which men are working.
- B. The operation of all valves in connection with work under this Contract shall be done by the Owner unless specified or otherwise directed by the Owner. Contractor shall notify the Water Department Superintendent 48 hours in advance of when any shutdown is required. Contractor shall schedule for and allow 48 hours before shutdown is achieved.
- C. Where valves within the scope of work are inaccessible due to a cover of asphalt or concrete, or tilted and/or broken gate box, the Contractor shall be responsible for raising the box to existing grade or fixing or replacing the gate box. This shall include a permanent surface repair and asphalt to conform to the original road surface.

### 3.2 EMERGENCY SHUT-DOWNS

- A. In cases of emergencies, the Owner reserves the right to suspend the cleaning and/or lining operations at any time or times necessary and to require the Contractor promptly to restore the water main to service.
- B. The Owner will make every effort to avoid such suspension and, if such suspensions are unavoidable, will limit them to the shortest possible time.
- C. Should any suspensions be effected for the above reason, the Contractor will be allowed extensions of time equal to the delay caused thereby, but he will not be allowed any additional compensation for any losses or damages sustained or alleged to have sustained as a result of such suspensions, except for the actual extra expenses as approved by the Owner.

### 3.3 CUTTING OR OPENING PIPES

- A. The Contractor shall open the pipe at each end of the section to be cleaned and lined and at intermediate gates, bends, fittings and obstructions shown on the Contract Drawings and at other locations which may be necessary to permit satisfactory cleaning and lining.
- B. Every effort must be made to prevent foreign material or sludge from entering lines adjacent to the Work.
- C. Open ends of pipe shall be temporarily sealed with mechanical caps or plugs at all times when not being worked on.
- D. Openings in the pipes shall be made by cutting out existing joints on pipes, or cutting the pipe square and true by hand or machine or removing existing couplings.
- E. At openings adjacent to sections under pressure or in service, the Contractor shall install blocking to prevent motion of the closed ends or valves during the time the pipe is open.

### 3.4 REPAIRING PIPES

- A. The Contractor shall make watertight all openings made in the pipelines.
- B. Closures shall be made with new ductile iron cement lined pipe, Class 52 minimum thickness, and with new couplings of approved design.

### 3.5 SERVICES, LATERALS AND BRANCHES

- A. The Contractor shall be responsible for cleaning debris or cement mortar to insure it does not interfere with the operations of valves, services, laterals, blow offs, etc.

- B. Contractor shall subsequently remove all mortar and debris from services, laterals, branches, etc., once lining is complete.
- C. All side lines, services, hydrant connections, etc. must be back flushed into the main immediately after cleaning and lining and then the main flushed before it is put back into service.
- D. The Contractor shall work with the Owner making arrangements to enter homes to back flush services once lining is complete, if required.
- E. All lines shall be blown back as not to disturb the adjacent mortar.

### 3.6 CEMENT MORTAR LINING

- A. Cement mortar lining shall be applied to the interior of the pipe as soon as possible after a section of pipeline has been cleaned to the satisfaction of the Owner.
- B. Contractor shall not install the lining in any section until approval of the interior surface has been obtained from the Owner.
- C. The thickness of the lining shall at no point be less than 3/16-inch nor more than 5/16-inch with every effort being made to keep it uniformly between 3/16-inch and 1/4-inch.
- D. The lining shall consist of a one-course application of cement mortar and each section shall be placed in uninterrupted continuity by a centrifugal machine projecting the mortar against the wall of the pipe without rebound, and with sufficient velocity to cause the mortar to be densely packed and to adhere in place.
- E. Compressed air shall not be used, nor will air or sand pockets, or lack of homogeneity in the lining be permitted.
- F. The mortar shall be mechanically troweled to produce a satisfactorily smooth surface.
- G. The lining machine shall be designed and propelled in such a way that it will travel smoothly through the pipe without variation in speed or rate of application of the cement mortar.
- H. Hand placing of mortar shall not be permitted except at points where machine placing is impossible or impractical.

### 3.7 FAILED LINING

- A. Any section, in the opinion of the Owner, that has failed as observed during the post TV inspection, shall be rectified by the Contractor at his expense.
- B. Failed lining shall be included but not be limited to the following:

1. Thickness below or above thickness specifications.
  2. Fall of cement lining.
  3. Lining pipe surface – exposed not covered by lining.
  4. Extremely rough surface – see paragraph 3.11 of this section.
- C. If the lining fails and the Contractor squeegees out the wet cement if there are any side branch connections four inch or larger, they shall be excavated and tee and pipe replaced to remove cement pushed up by branch.

### 3.8 CURING OF LINING

- A. Immediately upon the satisfactory completion of the lining of a section of pipeline, that section shall be closed at all openings to prevent the circulation of air.
- B. As soon as practicable after the placing of the lining, a sufficient amount of water shall be introduced into that section to keep the lining damp, and under no conditions shall the lining be permitted to dry out prior to returning the section to service.

### 3.9 PROTECTION OF LINING

- A. Every precaution shall be taken to prevent injury to the lining. Should it be damaged or be found unsatisfactory at any time previous to the completion of the Contract, such damaged or unsatisfactory portions shall be removed to the extent directed, and replaced to the satisfaction of the Engineer.

### 3.10 CLEANING UP

- A. The Contractor shall exercise responsible precautions to prevent contamination of the pipeline. At the conclusion of the Work prior to filling and sterilization, remove all fragments of mortar and all other debris from the pipeline, leaving it clean and ready for use to the satisfaction of the Engineer.
- B. During the course of the Work, keep the site of the operations in as clean and neat a condition as possible.
- C. Dispose of all residue resulting from the cleaning of the mains, and at the conclusion of the Work, remove and haul away any surplus material, broken pavement, lumber, equipment and any other refuse remaining from the reconditioning operations, and leave the entire site of the Work in a neat and orderly condition.
- D. Satisfactorily repair or restore any driveways, walks, culverts, pipes, fences, walls, poles, posts, curbs or other property damaged and shall leave them in condition equal to that which existed at the beginning of this Contract.

### 3.11 CHLORINATION OF WATER MAINS

- A. Upon completion of all cleaning and lining operations in a section of pipe line and after the work has been approved by the Engineer, chlorinate the completed section in accordance with Section 02610 Ductile Iron Pipe Fittings and Appurtenances of the Contract.
- B. Special procedures may be outlined by the Owner where the above-outlined method is not practicable. The entire procedure of chlorinating the mains shall be such as to prevent flows of water from a section exposed to possible contamination to a section of pipe which has been completed and chlorinated. Should such water from a contaminated section be allowed to enter a previously chlorinated section as a result of the Contractor's negligence or through necessity caused by failure of the Contractor to properly schedule his work, the section or sections of pipe thus affected shall be rechlorinated at the Contractor's own expense. Any temporary connection to the mains or other facilities required to accomplish the chlorination as just described shall be at the Contractor's expense. Any temporary connections shall be properly abandoned, as determined by the Owner at the Contractor's expense.

### 3.12 GUARANTEE OF CEMENT-MORTAR LINING

- A. The Contractor guarantees that the Work to be done under this Contract shall be done in a good and workmanlike manner in complete conformance with these Specifications, and that the materials furnished by him and used in the construction of the same, shall be free from defects and flaws. This guarantee shall be for a period of one (1) year from and after the date of final acceptance of the Work. It is hereby, however, specifically agreed and understood that this guarantee shall not include any repairs made necessary by any cause or causes other than defective work or materials.
- B. The Contractor guarantees to restore all cleaned and cement-mortar lined water mains to the following coefficients "C" in Hazen-Williams formula, all based on nominal pipe diameters with proper allowance being made for bends and fittings in accordance with accepted practice:

<u>Guaranteed Coefficient "C"</u>	
<u>Nominal Pipe Diameter</u>	<u>Hazen-Williams Formula</u>
36 inch	130
30 inch	130
24 inch	130
20 inch	125
16 inch	125
14 inch	125
12 inch	120
10 inch	115
8 inch	110
6 inch	100

- C. After the mains under this Contract have been cleaned and cement lined, a reputable test company, independent from the Contractor, shall be hired by the Contractor to perform loss-of-head tests to determine the Hazen-Williams coefficient of friction called "C". The complete testing as described herein shall be performed at the Contractor's expense. The test company must be approved by the Owner prior to commencement of test work, and the name, address, and a general qualification statement shall be submitted prior to start of testing.
- D. For the purpose of establishing "C" coefficient on such mains where it is not practical to carry the loss-of-head test through the full extent of the cleaned and cement-mortar lined main, the several sections thereof shall be tested and the weighted average coefficient "C" from tests of such portions shall be considered to be acceptable for the whole of the cleaned and cement-mortar lined main.
- E. All tests for establishing the coefficient "C" for water mains cleaned and cement-mortar lined under this Contract will be completed prior to final acceptance of this job.

### 3.13 HYDROSTATIC TESTING (LEAK DETECTION)

- A. After the mains have been cleaned and lined, pits reassembled, and main disinfected, the Contractor shall hire a third-party company to conduct leak detection on the cleaned and lined water mains. See Section 02610 for details.

END OF SECTION

## SECTION 02766

### TEMPORARY BYPASS PIPING WITH SERVICE HOSES

#### PART 1 - GENERAL

##### 1.1 DESCRIPTION

- A. Work Included: The Contractor shall provide temporary bypass pipe with service hoses to all areas affected by water main replacement. Minimum size temporary bypass pipe and locations are identified on the drawings.
- B. Related Work:
  - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.

##### 1.2 QUALITY ASSURANCE

- A. Use adequate numbers of skilled workers who are thoroughly trained and experienced in cleaning and lining pipelines and who are completely familiar with the specific requirements and methods needed for performance of the Work of this Section.
- B. Use equipment adequate in size, capacity, and numbers to accomplish the Work of this Section in a timely manner.
- C. In addition to complying with requirements of governmental agencies having jurisdiction, comply with the directions of the Engineer.
- D. The Contractor shall conduct all work in a professional manner and he/she shall use reasonable and appropriate care and skill in the performance of the Work under this Section.

##### 1.3 SUBMITTALS

- A. Comply with pertinent provisions of Section 01340.
- B. Product Data: Within fifteen (15) calendar days after the Contractor has received the Owner's Notice to Proceed, submit:
  - 1. Description of piping material.
  - 2. Proposed timeline of when bypass piping is to be placed for the project phases.
  - 3. Proposed bypass layout plan with pipe sizes and temporary hydrants shown.

## PART 2 - PRODUCTS

### 2.1 TEMPORARY BYPASS PIPE WITH SERVICE HOSE

- A. Temporary bypass piping shall not be of materials that compromise water quality, shall be fully adequate to withstand the pressures and all conditions of use and shall include 4-inch temporary hydrants provided at all locations of existing hydrants taken out of service.
  - 1. All temporary bypass piping shall conform to the same standards as permanent piping.
  - 2. The pipe and/or hose must be designated or certified for potable/residential water use and must meet NSF Standard 61 certification and/or AWWA Standards.
  - 3. Disinfection of temporary pipes and hoses must be performed in accordance with AWWA Standards.
  - 4. The recommended pipe materials are as follows:
    - a. Ductile iron pipe
    - b. Galvanized Steel pipe
    - c. High Density Polyethylene Fused Pipe
    - d. Service Pipe
      - i. Polyvinyl chloride (PVC) pressure hose
      - ii. Standard polyethylene (PE) pressure pipe and tubing, ½-inch through 3-inch
- B. Temporary bypass piping shall be provided on each side of the street for the entire length of the street. Temporary bypass piping shall also be provided on each side of side streets, where required.
- C. Temporary service shall be provided through one of the following methods, and as directed by the Owner:
  - 1. Connection made outside the building at a sill cock (not an option if backflow device is present).
  - 2. Connection made inside the building at a service meter.
  - 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.
    - a. This method shall be required, if when 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.
    - b. 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.
- D. Water service lines shall be flushed prior to returning to permanent service.
- E. The Contractor shall be responsible for maintaining all temporary service lines from the roadway to the connection points at the curb stops.

- F. The pipe and other materials shall provide adequate water tightness, and care shall be exercised throughout the installation of the temporary pipe and making up of all temporary connections to avoid any possible pollution of any mains or services, or contamination of the temporary bypass pipe itself.
- G. The Contractor shall chlorinate, dechlorinate, and flush all temporary pipe and hose to prevent contamination, prior to initiating temporary service.
- H. The temporary pipe will be activated only after negative bacteriological results are obtained, based upon samples and analysis provided by the Contractor.
- I. The Contractor shall adequately work and provide protection to the public associated with the temporary piping system installed.
- J. Lights, barricades and signs shall be placed to insure safety at the location of the temporary piping.

## 2.2 MATERIALS

- A. Restraint for existing gate valves should be provided as detailed in the drawings and shall include at a minimum friction clamps, four (4) 304 SS ¾" threaded rods per each existing gate valve, and 304 SS hardware.
  - 1. The intent is to fully restrain existing gate valves acting as a line stop where work is occurring in or near the pit.
- B. Provide other materials not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the approval of the Engineer.

## PART 3 - EXECUTION

### 3.1 DEWATERING PIPES

- A. The Contractor shall dewater all pipe lines prior to starting the Work, drain all low spots, make all excavations at locations required to facilitate the Work, and take special precautions to prevent the possibility of any water entering the sections in which men are working.
- B. The operation of all valves in connection with work under this Contract shall be done by the Owner unless specified or otherwise directed by the Owner. Contractor shall notify the Water Department Superintendent 48 hours in advance of when any shutdown is required. Contractor shall schedule for and allow 48 hours before shutdown is achieved.
- C. Where valves within the scope of work are inaccessible due to a cover of asphalt or concrete, or tilted and/or broken gate box, the Contractor shall be responsible for raising the box to existing grade or fixing or replacing the gate box. This shall include a permanent surface repair and asphalt to conform to the original road surface.

### 3.2 EMERGENCY SHUT-DOWNS

- A. In cases of emergencies, the Owner reserves the right to suspend the water main replacement operations at any time or times necessary and to require the Contractor promptly to restore the water main to service.
- B. The Owner will make every effort to avoid such suspension and, if such suspensions are unavoidable, will limit them to the shortest possible time.
- C. Should any suspensions be effected for the above reason, the Contractor will be allowed extensions of time equal to the delay caused thereby, but he will not be allowed any additional compensation for any losses or damages sustained or alleged to have sustained as a result of such suspensions, except for the actual extra expenses as approved by the Owner.

### 3.3 CUTTING OR OPENING PIPES

- A. Every effort must be made to prevent foreign material or sludge from entering lines adjacent to the Work.
- B. Open ends of pipe shall be temporarily sealed with mechanical caps or plugs at all times when not being worked on.
- C. Openings in the pipes shall be made by cutting out existing joints on pipes, or cutting the pipe square and true by hand or machine or removing existing couplings.
- D. At openings adjacent to sections under pressure or in service, the Contractor shall install blocking to prevent motion of the closed ends or valves during the time the pipe is open.

### 3.4 REPAIRING PIPES

- A. The Contractor shall make watertight all openings made in the pipelines.
- B. Closures shall be made with new ductile iron cement lined pipe, Class 52 minimum thickness, and with new couplings of approved design.
- C. New couplings and fittings used shall be poly-wrapped with 8-mil polyethylene after installation to resist corrosion.

### 3.5 SERVICES, LATERALS, AND BRANCHES

- A. Contractor shall be responsible for cleaning debris to insure it does not interfere with the operations of valves, services, laterals, blow offs, etc.

- B. All side lines, services, hydrant connections, etc. must be back flushed into the main immediately after construction and then the main flushed before it is put into service.
- C. The Contractor shall work with the Owner making arrangements to enter homes/businesses to back flush services once construction is complete, if required.

### 3.6 CLEANING UP

- A. Contractor shall exercise responsible precautions to prevent contamination of the pipeline.
- B. During the course of the Work, keep the site condition of the operations as clean and neat as possible.
- C. At the conclusion of the Work, remove and haul away any surplus material, broken pavement, lumber, equipment, and any other refuse remaining from construction operations, and leave the entire site of the Work in a neat and orderly condition.
- D. Satisfactorily repair or restore any driveways, walks, culverts, pipes, fences, walls, poles, posts, curbs, or other property damaged and shall leave them in condition equal to that which existed at the beginning of this Contract.

### 3.7 CHLORINATION OF WATER MAINS

- A. Chlorinate bypass piping in accordance with the AWWA Manual C651, "AWWA Standard for Disinfecting Water Mains".
- B. All materials, equipment, labor, and chlorine shall be furnished by the Contractor.
- C. The entire procedure of chlorinating the pipes shall be discussed in advance of the time the Work is to be done, and the methods employed shall be fully satisfactory to the Owner.
- D. The disinfection shall be accomplished by pumping a chlorine solution into the pipe at a dose concentration of 25 mg/l.
- E. After the 24-hour retainer period, the treated water shall have a residual of not less than 10 mg/l. Once verified, chlorinated water shall be flushed from the main until the chlorine concentration in the water leaving the main is no higher than in the system or less than 1.5 mg/l.
- F. Solution must be dechlorinated prior to disposal.
- G. After final flushing and before the water main is placed in service, a sample or samples shall be collected from the end of the line and tested for bacteriologic quality and shall show the absence of coliform organisms. In the case of mains exceeding 1,200 feet, samples shall be collected along the length of the line as well as the end of the line. The samples shall be collected by the Contractor, with microbiological analysis by a laboratory satisfactory to Owner.

- H. If the initial disinfection fails to produce satisfactory results, the procedure shall be repeated at the Contractor's expense until satisfactory results have been obtained.
- I. Special procedures may be outlined by the Owner where the above-outlined method is not practicable. The entire procedure of chlorinating the mains shall be such as to prevent flows of water from a section exposed to possible contamination to a section of pipe which has been completed and chlorinated. Should such water from a contaminated section be allowed to enter a previously chlorinated section as a result of the Contractor's negligence or through necessity caused by failure of the Contractor to properly schedule his work, the section or sections of pipe thus affected shall be re-chlorinated at the Contractor's own expense. Any temporary connection to the mains or other facilities required to accomplish the chlorination as just described shall be at the Contractor's expense. Any temporary connections shall be properly abandoned, as determined by the Owner, at the Contractor's expense.

### 3.8 TEMPORARY BYPASS PIPE WITH SERVICE HOSES

#### A. General

1. Contractor shall furnish, install, maintain, and remove bypass pipes of the size required to provide adequate fire supply and satisfactory service to all dwellings, shops, etc., serviced by the mains to be replaced, whether occupied at the time or not. For 1 ½-inch service lines, a minimum ¾-inch bypass service hose shall be used.
2. Minimum size Temporary By-Pass Main and locations are identified on the drawings.
3. The bypass pipes shall be tied into the house service at the curb box by the Contractor, or as specified by the Owner.
4. Without additional compensation, Contractor shall also furnish, install, maintain, and remove service hoses or pipe, of approved size, to service all consumers from gated connections on said bypass pipe.
5. The Contractor shall be responsible for maintaining all temporary service lines from the roadway to the connection points at each dwelling.

#### B. Installation

1. The temporary bypass pipe shall be laid in locations satisfactory to the Owner where it will cause the least obstruction, and is less likely to be damaged.
2. Contractor will be required to cover clamps and bolts used to connect the bypass arrangement.
3. Cover material will be cold patch, sand bags, or any other material acceptable to the Owner.
4. At driveways, provision shall be made to permit driving over the temporary pipe by the use of cold patch or other material to form a ramp on each side of the pipe.
5. If the temporary bypass crosses any street, a narrow trench shall be cut in the paving and the temporary pipe placed just below the surface with temporary surfacing above it, or other satisfactory arrangements shall be made.
6. The location, method placing, materials employed, and the sanitary precautions shall be fully satisfactory to the Owner.

C. Removal and Cleaning Up

1. At the conclusion of the use of temporary bypass pipes and service hoses, they shall be removed and hauled away by the Contractor and any connections which have previously been interrupted shall be completely restored by him/her in full compliance with the precautions which are required to prevent the possibility of contamination.

END OF SECTION

## SECTION 02579

### CASTING ADJUSTMENT

#### PART 1 - GENERAL

##### 1.1 DESCRIPTION

- A. Work Included: Adjust to finish grade castings whose finish grade has been altered by the construction, as required by the Contract Documents.
- B. Related Work:
  - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.
  - 2. Section 02221 Trenching, Backfilling and Compacting
  - 3. Section 02513 Asphaltic Concrete Paving
  - 4. Section 03300 Cast-in-Place Concrete

##### 1.2 QUALITY ASSURANCE

- A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.
- B. The Contractor shall conduct all work in a first-class workmanlike manner, and he/she shall use reasonable and appropriate care and skill in the performance of the work under this section.

##### 1.3 SUBMITTALS

- A. None required.

##### 1.4 PRODUCT HANDLING

- A. Comply with pertinent provisions of Section 01610.

#### PART 2 - PRODUCTS

##### 2.1 MATERIALS

- A. Concrete: See Specification Section 03300.

## PART 3 - EXECUTION

### 3.1 CONDITIONS

- A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

### 3.2 CASTING ADJUSTMENTS

- A. In roadway areas, where permanent resurfacing is to be applied, existing gate boxes, manhole and catch basin frames shall be adjusted to the grade of the new pavement.
  - 1. A neat line shall be cut in the pavement around the existing frames.
  - 2. The material: Gravel, pavement and concrete collar (if there) shall be removed down to six (6)-inches below the frame.
  - 3. The casting is to be freed from its existing grout bed and shimmed with steel shims of the appropriate thickness, at a minimum of four (4) alternate locations, so as to ensure that the casting will not rock. The casting is then to be set into a full bed of grout and a concrete collar placed around the frame, up to within three (3)-inches of the existing pavement.
  - 4. The frame shall be protected from damage from traffic until the concrete has taken a firm set.
  - 5. Frames and covers which are not on the same plane as the final grade shall be reset.

END OF SECTION

## INDEX

### DIVISION 3 - CONCRETE

<u>Section</u>	<u>Subject</u>	<u>Page</u>
03300	Cast-In-Place Concrete	03300-1 thru 03300-4

## SECTION 03300

### CAST-IN-PLACE CONCRETE

#### PART 1 - GENERAL

##### 1.1 DESCRIPTION

- A. Work Included: Provide all the cast-in-place concrete as required by the Contract Documents including but not limited to, form work, reinforcing and finishing, thrust blocking, or other purposes, as directed by the Engineer.
- B. Related Work:
  - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.

##### 1.2 QUALITY ASSURANCE

- A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the Work of this Section.
- B. The Contractor shall conduct all work in a first-class workmanlike manner, and he/she shall use reasonable and appropriate care and skill in the performance of the Work under this Section.

##### 1.3 SUBMITTALS

- A. None required under this Section.

##### 1.4 PRODUCT HANDLING

- A. Bags of cement shall be stored in a dry area which is protected from the weather.

#### PART 2 - PRODUCTS

##### 2.1 CEMENT

- A. Provide a standard brand of Portland cement complying with ASTM C150, type II, low alkali. Do not change the brand of cement during progress of the Work except as approved in writing by the Engineer.

## 2.2 AGGREGATES

### A. General:

1. Provide hard rock aggregate complying with ASTM C33, with additional attributes as specified herein.

### B. Fine Aggregate:

1. Fine aggregate shall consist of washed inert natural sand conforming to the requirements of ASTM Specifications C-33, and the following detailed requirements:

<u>Sieve No.</u>	<u>Retained</u>
4	0.5%
16	25-40
50	70-87
100	93-97

### C. Coarse Aggregates:

1. Provide coarse aggregate consisting of clean, hard, fine-grained, sound crushed rock or washed gravel, conforming to the requirements of ASTM Specification C-33.
2. Use coarse aggregate of the largest practicable size for each condition of placement, subject to the following maximum size limitations:
  - a. 2-inch for plain concrete  
1-inch for reinforced sections 10 inches and over in thickness  
3/4-inch for reinforced sections less than 10 inches in thickness
3. Grade combined aggregates within the following limits:

Sieve Size or Inch Size in Inches:	Percentage by weight passing sieve:					
	<u>1-1/2" aggregate:</u>		<u>1" aggregate:</u>		<u>3/4" aggregate:</u>	
	Min:	Max:	Min:	Max:	Min:	Max:
1-1/2"	95	---	---	---	---	---
1"	75	90	90	100	---	---
3/4"	55	77	70	90	90	100
3/8"	40	55	45	65	60	80
No. 4	30	40	31	47	40	60
No. 8	22	35	23	40	30	45
No. 30	10	20	10	23	13	23
No. 50	2	8	2	10	5	15
No. 100	0	3	0	3	0	5

## 2.3 WATER

- A. Use only water which is clean and free from deleterious amounts of acid, alkali, salt, and organic matter.

## 2.4 REINFORCEMENT MATERIALS AND ACCESSORIES

- A. Bars:
  - 1. Provide deformed billet steel bars complying with ASTM A615, using grades shown on the Drawings.
  - 2. Where grades are not shown on the Drawings, use grade 60.
- B. Steel Wire:
  - 1. Comply with ASTM A82.
  - 2. For tie wire, comply with Fed Spec QQ-W-461, annealed steel, black, 16 gauge minimum.
- C. Welded Wire Fabric:
  - 1. Provide welded steel, complying with ASTM A185.

## PART 3 - EXECUTION

### 3.1 CONCRETE MIXING

- A. Class A Concrete
  - 1. Class A concrete shall have a minimum compressive strength, at 28 days, of 3,500 psi, with a maximum water content of 6.4 gal./100 lbs. and a minimum cement content of 520 lbs./cubic yard.
- B. Class B Concrete
  - 1. Class B concrete shall have a minimum compressive strength at 28 days of 2,500 psi, with a maximum water content of 7.4 gal./100 lbs. and a minimum cement content of 430 lbs./cubic yard. Class B concrete may be mixed on site using a 1:2.5:5 mix and made with no less than 4.5 bags of cement per cubic yard.
- C. Ready Mix Concrete
  - 1. Ready mixed concrete shall comply with ASTM C94.

### 3.2 REINFORCEMENT

- A. Reinforcing shall be placed as shown and specified in the Contract Documents.

### 3.3 PLACEMENT OF CONCRETE

- A. Concrete shall be carefully placed to ensure dense, compact concrete. Concrete shall be thoroughly spaded or vibrated into position without disturbance of pipelines or other materials.
1. Concrete shall be placed with as little slump as practicable.
  2. The pipe shall be securely braced, both vertically and horizontally, if it is to be encased, to prevent flotation.
  3. The sides of thrust blocks shall be formed.
  4. Concrete shall not be placed over bolts or nuts so as to prevent the removal of the joint glands.
  5. Backfill shall not be placed on the concrete until the concrete has set firm.

END OF SECTION

## INDEX

### APPENDIX

MassDOT Roadway Permit

MassDOT Special Details



Charles D. Baker, Governor  
Karyn E. Polito, Lieutenant Governor  
Stephanie Pollack, Secretary & CEO  
Jonathan L. Gulliver, Highway Administrator



3-2019-0146

**NATICK**  
**Utility: Capital Improvements – Water/Sewer**

Subject to all of the terms, conditions and restrictions printed or written below, permission is hereby granted to the **TOWN OF NATICK** to enter upon the State Layout on the road known as **ROUTE 9**, North Main Street for the purpose of cleaning and relining the 12' and 8' water main replacing 6" cast iron water main with 8" DI water main and relining of sewer mains, as shown on the plans on file in the MassDOT Highway Division, District Three Permits Office.

**48 HOURS PRIOR TO THE START OF ANY WORK BEING CONDUCTED WITHIN THE STATE**  
**HIGHWAY LAYOUT CONTACT THE FOLLOWING:**

**Dave Blodgett – District Permit Compliance Engineer @ 617-892-3640**

Provide Permit #, date the work is to be started, the contractor who will be performing the work, name, address, and telephone number of person to be contact in case of emergency.

**WORK HOURS:**

No equipment, trucks, etc. shall occupy any part of the traveled way except between the **9:00 PM and 5:00 AM from Sunday through Thursday**. No work shall be allowed on holidays or at any times between and including the day before or the day after a long weekend which involves a holiday without the permission of the District Maintenance Engineer.

In no case will operations commence prior to the specified hours of this Permit. This includes traffic set-ups that restrict the flow of traffic upstream of and through the construction zone.

All operations shall be conducted so as not to interfere with, interrupt, or endanger the general public or the traffic flow.

At any time during construction operations when a traffic delay of over twelve (12) minutes occurs and the situation is worsening, the Grantee or the Department shall begin to suspend operations. Continuously increasing delays of over twelve (12) minutes shall not be permitted. When it appears that delays are developing, one or more of the parties mentioned above shall drive the queue to determine the actual time of delay. Monitoring of traffic delays will be a continuous process until the job activity is complete and off the traveled way or until the determination is made to suspend operations.

**TRENCH:**

***The Grantee(s) must adhere to 520 CMR 14.00; EXCAVATION AND TRENCH SAFETY, AS promulgated by the Department of Public Safety in conjunction with the Division of Occupational Safety pursuant to authority granted by M.G.L. c. 82A § 1.***

***The attached Trench Permit Rider shall become integral part of the terms and conditions of this permit.***

District 3, 403 Belmont Street Worcester, MA 01604  
Tel: (508) 929-3800, FAX: (508) 799-9763  
[www.mass.gov/orgs/highway-division](http://www.mass.gov/orgs/highway-division)

Between November 1<sup>st</sup> and April 1<sup>st</sup>, no trench shall be covered with a steel plate without the permission of the District Maintenance Engineer. Should the Grantee be unable to obtain permission to use a steel plate, then these instructions shall be followed: The trench shall be backfilled with gravel compacted as per MHD standards and the top 3 inches of the trench shall consist of bituminous concrete Type I-1 temporary patch compacted in two (2) one and one-half inch (1 ½") lifts. The entire backfill shall be removed after a minimum of 90 days and replaced with *\*Control Density Fill (CDF)* to within 7 inches of the finished grade and completed as stated above.

Attention is called to the clauses in this permit relating to the laying of pipes, conduit, etc.

All excavated material, including bituminous concrete, cement concrete, stone, gravel, etc., shall be removed from the State Highway Layout. No stockpiling will be allowed within the State Highway Layout.

In the event of an overlay the placement of the traffic lines shall be the responsibility of the Grantee. The District Traffic Maintenance Engineer shall be notified prior to the placement of new pavement markings at Tel. No. 1-508-929-3800.

The Grantee shall assume full responsibility for the structural integrity of any trench described in this Permit. This responsibility shall remain in place for a period of three years after the completion of work which time starts with the Department receiving the Completion of Work Form.

#### **GENERAL:**

All work shall be performed in accordance with the 1988 Massachusetts Highway Department Standard Specifications for Highways and Bridges (English Edition); the Supplemental Specifications (English Edition), dated February 25, 2010; the 2010 Construction Standards; the current Manual on Uniform Traffic Control Devices for Streets and Highways (MUTCD) with latest revisions; the 1990 Standard Drawings for Traffic Signals and Highway Lighting; and the American Standard for Nursery Stock Current Edition (ANSI Z-60.1-2004).

#### **UNIFORMED POLICE OFFICERS SHALL BE IN ATTENDANCE TO DIRECT TRAFFIC.**

All street approaches and driveways where disturbed shall be replaced conforming to original alignment, grade and materials.

The shoulder area shall be restored to a condition as good as existed prior to the work.

All grassed areas where disturbed shall be restored to as good condition as found by loaming and seeding.

Accommodation shall be made for the safety of pedestrian traffic during the work period.

Care shall be exercised to protect existing underground structures.

The bounds marked MHB shall not be disturbed or buried.

No trench shall be left open overnight. If it becomes necessary for said trench to be left overnight, then it shall be covered with steel plates.

No metal drums are allowed within the State Highway Layout.

All required signs and traffic warning devices, **including the use of arrowboard(s)**, shall be furnished by the Grantee. All signs and devices shall be in accordance with the current edition of the FHWA Manual on Uniform Traffic Control Devices. The number and location of all signs and devices shall be as deemed necessary by the Engineer for the safe and efficient performance of the work and the safety of the traveling public.

All warning devices shall be subject to removal, replacement and/or repositioning by the Grantee as often as deemed necessary by the Engineer.

Cones or non-reflectorized warning devices shall not be left in operational position on the highway when the daytime operations have closed. If it becomes necessary for the MassDOT Highway Division to remove any warning devices or appurtenances from the project due to negligence by the Grantee, all costs for this work will be charged to the Grantee.

Only a minimal amount of men and equipment shall occupy the State Highway location.

All vehicles excepting passenger cars which are assigned to the permitted project and which operate on the site at speeds of 25 mph or less shall have an official SLOW MOVING VEHICLE emblem displayed.

Only equipment to be used in the actual construction work shall be allowed within the State Highway location.

**All personnel who are working in the State Highway Layout shall wear safety vests and hardhats.**

The Grantee shall exercise this permit subject to all the rules and regulations made from time to time by the said MassDOT Highway Division and the Department of Public Utilities and nothing in the permit shall be construed as authorizing any installation or maintenance thereof except in strict conformity with all Federal, State and Municipal laws, ordinances and regulations.

The Grantee shall indemnify and save harmless the Commonwealth and MassDOT Highway Division against all suits, claims or liability of every name and nature arising at any time out of or in consequence of the Acts of the Grantee in the performance of the work covered by this permit and/or failure to comply with the terms and conditions of this permit whether by itself or its employees or subcontractors.

A copy of this permit will be made available at the project site at all times during the progress of work for inspection by Department Personnel. Should the Grantee or contractor not have a copy at the site, the work will be stopped until such permit is made available.

ALL OF SAID WORK SHALL BE DONE AS DIRECTED AND TO THE SATISFACTION OF THE ENGINEER FROM THIS DEPARTMENT.

(SEE ATTACHED SHEETS FOR ADDITIONAL CONDITIONS)

No work shall be done under this permit until the Grantee shall have communicated with and received instructions from the District Highway Director of the MassDOT Highway Division listed below.

District 3, 403 Belmont Street Worcester, MA 01604

Tel: (508) 929-3800, FAX: (508) 799-9763

[www.mass.gov/orgs/highway-division](http://www.mass.gov/orgs/highway-division)



Charles D. Baker, Governor  
Karyn E. Polito, Lieutenant Governor  
Stephanie Pollack, Secretary & CEO  
Jonathan L. Gulliver, Highway Administrator



## Approved Signature

A handwritten signature in cursive script, appearing to read 'Barry Lorion', written over a horizontal line.

Barry Lorion by J.R.  
District Highway Director

Date of Issue: February 22, 2019

Permit Expiration: Saturday, February 22, 2020

CITY/TOWN: **NATICK**

**FROM: JASON BENOIT, ACTING MAINTENANCE ENGINEER**

**TO: C.S. III's, C.S.II's, & HWY REPAIR FOREMAN**

Section: **"B"**

Enclosed please find permit # **3-2019-0146** relating to work within your Section. Please familiarize yourself with the contents, provisions, station to station limits, etc., of the permit in order to avoid violations with the permit regulations.

You are directed to inspect the subject project **DAILY** for the duration of the permit to insure the contractor conforms to the permit.

Your cooperation to the above policy is expected and essential for proper execution of the permit regulations.

Thank you.

Permit Office

### **Conditions Relating Particularly to Permits for the Laying of Pipes, Conduits, etc.**

After any pipes, conduits, drains or other underground structures are laid, or any excavation is made in the roadway, the trenches or openings shall be properly back-filled with suitable material, the back-filling shall be thoroughly tamped, and the surface of the road over said structure shall be left even with the adjoining ground. If the work is done in cold weather no frozen material shall be used for back-filling.

Wherever the hardened surface of the roadway, gutters, or any part of the surface of the highway is disturbed it shall be replaced in as good condition as before it was disturbed, and if new materials are required they shall correspond with those already in place on the road.

Where service pipes are to cross the highway the connections shall be made without disturbing the hardened surface of the roadway, by driving the pipes under the roadway, or the service pipes shall be carried under and across the road in a larger pipe, unless otherwise ordered by the Engineer.

The Grantee shall maintain the surface of the roadway over said structures as long as the Department may deem necessary, until all signs of the trenches shall have been eliminated.

### **Conditions Relating Particularly to Permits for the Erection of Poles, Wires, and Overhead Structures, and the Cutting and Trimming of Trees**

In the erection of pole lines, unless otherwise herein provided, no trees located within the limits of the State Highway shall be cut or trimmed. No guy wires shall be attached to trees without a special permit from the Department, and in no event shall they be so attached as to girdle the trees or in any way interfere with their growth. The wires shall be so protected at all times and places that they shall not interfere with or injure the trees either inside or outside the location of the highway.

Where the cutting or trimming of trees is authorized by this permit, only such cutting and trimming shall be done as may be designated by the Engineer.

In the construction or reconstruction of pole lines no guy wires shall be erected nearer to the surface of the ground than six feet; provided, however, that the owners of such lines may maintain such guy wires at a lower elevation than six feet from the ground until such time as the Department shall notify them to remove said wires or to raise them to the elevation first stated.

In order to protect the trees through which any wires may pass, said wires shall be insulated and such other tree guards used as may be directed by the Engineer.

Where high tension wires are erected under this permit, they shall be so located that, under conditions of maximum severity as regards a coating of ice or snow, there shall be a space of at least eight feet between such high tension wires and other wires.

The Grantee shall, within sixty days from the date of completion of the work, file in the office of the Department a plan showing the location of each pole erected in accordance with the permit, said plan to be of such form as the Department may direct.

**Page 2 of 3**

### **General and Additional Conditions**

Whenever the word "Department" is used herein it shall mean the MassDOT Highway Division.

Whenever the word "Engineer" is used it shall mean the District Highway Director or other authorized representative of the Department.

Whenever the word "Grantee" is used herein, it shall mean the person or persons, corporation or municipality to whom this permit is granted to or their legal representatives.

During the progress of the work all structures underground and above ground shall be properly protected from damage or injury; such barriers shall be erected and maintained as may be necessary for the protection of the traveling public; the same shall be properly lighted at night; and the Grantee shall be responsible for all damages to persons or property due to or resulting from any work done under this permit.

Except as herein authorized, no excavation shall be made or obstacle place within the limits of the State highways in such a manner as to interfere unnecessarily with the travel over said road.

If any grading or sidewalk work done under this permit interferes with the drainage of the State highway in any way, such catch basins and outlets shall be constructed as may be necessary, in the opinion of the Engineer, to take proper care of said drainage.

Wherever the hardened surface of the roadway is disturbed and the Engineer may consider it necessary or advisable to do so, said surface will be restored by the employees of the Department, at such time as the Department may direct, and the expense thereof shall be borne by the Grantee, who shall purchase and deliver on the road the materials necessary for said work if and when directed by the Engineer. All payments to material men and to laborers, inspectors, etc., employed by the Department for or on account of the work herein contemplated shall be made by said Grantee forthwith on the receipt of written orders, pay rolls, or vouchers approved by the Department.

IF THE GRANTEE DOES ANY WORK CONTRARY TO THE ORDERS OF THE ENGINEER, AND, AFTER DUE NOTICE, FAILS TO CORRECT SUCH WORK OR TO REMOVE STRUCTURES OR MATERIALS ORDERED TO BE REMOVED, OR FAILS TO COMPLETE WITHIN THE SPECIFIED TIME THE WORK AUTHORIZED BY THIS PERMIT, THE DEPARTMENT MAY, WITH OR WITHOUT NOTICE, CORRECT OR COMPLETE SUCH WORK IN WHOLE OR IN PART, OR REMOVE SUCH STRUCTURES OR MATERIALS, AND THE GRANTEE SHALL REIMBURSE THE COMMONWEALTH FOR ANY EXPENSE INCURRED IN CORRECTING AND/OR COMPLETING THE WORK OR REMOVING THE STRUCTURES OR MATERIALS.

ALL OF THE WORK HEREIN CONTEMPLATED SHALL BE DONE UNDER THE SUPERVISION AND TO THE SATISFACTION OF THE MASSDOT HIGHWAY DIVISION, AND THE ENTIRE EXPENSE THEREOF SHALL BE BORNE BY THE GRANTEE.

On the completion of the work herein contemplated all rubbish and debris shall be removed and the roadway and roadsides shall be left neat and presentable and satisfactory to the Engineer.

The Department hereby reserves the right to order the change of location or the removal of any structures authorized by this permit at any time, said change or removal to be made by and at the expense of the Grantee or its/their successors or assigns.

**Page 3 of 3**

This permit may be modified or revoked at any time by the Department without rendering said Department or the Commonwealth of Massachusetts liable in any way.

The Grantee shall pay the salary, subsistence and traveling expenses of any inspector appointed by the Department to supervise the work herein contemplated.

All of the above conditions shall be applicable to the work herein authorized, unless the same are inconsistent with the conditions on the face of the permit, in which case the conditions written or printed on the face of the permit shall apply.

The acceptance of this permit or the doing of any work there under shall constitute an agreement by the Grantee to comply with all of the conditions and restrictions printed or written herein.

**TO THE GRANTEE:**

You may proceed with the work described in the accompanying Permit, which has been issued to you by the Massachusetts Department of Transportation.

Please read carefully the instructions printed on the three additional pages of the Permit and note particularly those conditions, which apply to the work authorized.

Your attention is also called to the time given for the completion of this work. If it should be desired to extend the time for doing the work or alter any of the conditions of the Permit, application for such changes should be made as soon as possible to this office.

Upon completion of the work outlined, please fill out the form given below, detach and mail to this office. (A sketch on the back of the form or on a separate sheet, showing the location of any structures installed should be submitted. This sketch should show the relative positions of the structure by measurements to definite points within the highway location). IF THIS NOTICE IS NOT RETURNED, THE LIABILITY ASSUMED UNDER THIS PERMIT WILL CONTINUE.

**NOTICE: at least 48 hours prior to starting work, please contact the District #3 Permit Compliance Engineer Dave Blodgett at (617) 892-3640**

Very truly yours,

Barry J. Lorion  
Acting District Three Highway Director

-----  
**TOWN of NATICK**

***Return to:***

*District Three Permits Office  
MassDOT / Highway Division  
403 Belmont Street  
Worcester, MA 01604*

*CHC*

Dear Sir:

Please be advised that the work authorized under Permit No. **3-2019-0146** issued by the Massachusetts Department of Transportation was completed in accordance with all the requirements of the Department on \_\_\_\_\_.

Signed: \_\_\_\_\_

**NATICK**  
75 West Street  
Natick, MA 01760