TOWN OF PLAINVILLE, MA

Grove St./Pleasant St. Watermain Replacement

CONFORMED Contract Documents For Construction

40 Shattuck Road | Suite 110
Andover, Massachusetts 01810
800.426.4262

Project No. 0233560.00
Plainville Water & Sewer Department

March 2022

woodardcurran.com
COMMITMENT & INTEGRITY DRIVE RESULTS

SECTION 00 01 07

SEALS PAGE

The engineering material and data contained in these Bidding Documents were prepared under the supervision and direction of the undersigned, whose seal as registered professional engineer is affixed below.

Date of Issue: December 8, 2021

Arthur Leventis, P.E.
Woodard & Curran, Inc. (Engineer)

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SECTION 00 31 00

AVAILABLE PROJECT INFORMATION

INFORMATION	LOCATION OF INFORMATION
Geotechnical Data Soil Boring Logs	Following this page
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END OF SECTION

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Boring No. B-1

Plainville, Massachusetts

START DATE: January 2021 BORING DEPTH (bgs): 9' BGS
CONTRACTORS: New England Geotech, Inc.
DRILLERS: Hayes Rembijas
CLIENT: Woodard & Curran G.WATER DEPTH (bgs):
DRILLING METHOD: Geoprobe 6600
SAMPLING METHOD: Macrocore Sampling System

Depth	Sample ID	Rec. Length	PID (ppm)	Field Description and Remarks
0				
	S-1	24"		0-10" Asphalt and subbase
1'				10-24" Fine brown SAND with trace Gravel
2'				
	S-2	24"		0-24" Fine brown SAND with trace Gravel
3'				
4'				
	S-3	24"		0-24" Medium to fine SAND with trace Gravel
5'				Moist @ 6' BGS
6'				
	S-4	36"		0-36" Compact fine brown Sand and Silt with trace Gravel
7'				Refusal not encountered
				Groundwater not observed in borehole
8'				
9'				
10'				
11'				
12'				
13'				
15'				

Boring No. P-2

Plainville, Massachusetts

START DATE: January 2021 PROBE DEPTH (bgs): 9' BGS
CONTRACTORS: New England Geotech, Inc.
DRILLERS: Hayes Rembijas
CLIENT: Woodard & Curran G.WATER DEPTH (bgs):
DRILLING METHOD: Geoprobe 6600
SAMPLING METHOD: Macrocore Sampling System

Depth	Sample ID	Rec. Length	PID (ppm)	Field Description and Remarks
0				
				Refusal not encountered
1'				Groundwater not encountered
2'				
3'				
4'				
5'				
6'				
7'				
8'				
9'				
10'				
11'				
12'				
13'				
15'				

Boring No. B-3

Plainville, Massachusetts

START DATE: January 2021 BORING DEPTH (bgs): 9' BGS
CONTRACTORS: New England Geotech, Inc.
DRILLERS: Hayes Rembijas
CLIENT: Woodard & Curran G.WATER DEPTH (bgs):
DRILLING METHOD: Geoprobe 6600
SAMPLING METHOD: Macrocore Sampling System

Depth	Sample ID	Rec. Length	PID (ppm)	Field Description and Remarks
0				
	S-1	12"		0-12" Asphalt and subbase
1'				Cobble stuck in cutting shoe
2'				
	S-2	24"		0-24" Fine brown SAND with trace Gravel
3'				
4'				
	S-3	24"		0-24" Fine brown SAND with trace Gravel
5'				
6'				
	S-4	36"		0-12" Fine brown SAND with trace Gravel
7'				12-24" Gravel and Cobbles
				24-36" Medium to fine SAND with Gravel and Cobbles
8'				Groundwater not observed in borehole
				Refusal not encountered
9'				
10'				
11'				
12'				
13'				
15'				

Boring No. P-4

Plainville, Massachusetts

START DATE: January 2021 PROBE DEPTH (bgs): 9' BGS
CONTRACTORS: New England Geotech, Inc.
DRILLERS: Hayes Rembijas
CLIENT: Woodard & Curran G.WATER DEPTH (bgs):
DRILLING METHOD: Geoprobe 6600
SAMPLING METHOD: Macrocore Sampling System

Depth	Sample ID	Rec. Length	PID (ppm)	Field Description and Remarks
0				
				Refusal not encountered
1'				Groundwater not encountered
2'				
3'				
4'				
5'				
6'				
7'				
8'				
9'				
10'				
11'				
12'				
13'				
15'				

Boring No. B-5

Plainville, Massachusetts

START DATE: January 2021 BORING DEPTH (bgs): 9' BGS
CONTRACTORS: New England Geotech, Inc.
DRILLERS: Hayes Rembijas
CLIENT: Woodard & Curran G.WATER DEPTH (bgs):
DRILLING METHOD: Geoprobe 6600
SAMPLING METHOD: Macrocore Sampling System

Depth	Sample ID	Rec. Length	PID (ppm)	Field Description and Remarks
0				
	S-1	24"		0-6" Asphalt and subbase
1'				6-16" Medium to coarse brown SAND
				16-24" Fine brown SAND
2'				
	S-2	24"		0-24" Fine brown SAND with trace Gravel
3'				
4'				
	S-3	24"		0-24" Medium to fine SAND with trace Gravel and Till
5'				
6'				
	S-4	48"		0-48" Compact glacial Till with trace Gravel
7'				Refusal not encountered
				Groundwater not observed in borehole
8'				
9'				
10'				
11'				
12'				
13'				
15'				

Boring No. P-6

Plainville, Massachusetts

START DATE: January 2021 PROBE DEPTH (bgs): 9' BGS
CONTRACTORS: New England Geotech, Inc.
DRILLERS: Hayes Rembijas
CLIENT: Woodard & Curran G.WATER DEPTH (bgs):
DRILLING METHOD: Geoprobe 6600
SAMPLING METHOD: Macrocore Sampling System

Depth	Sample ID	Rec. Length	PID (ppm)	Field Description and Remarks
0				
				Refusal not encountered
1'				Groundwater not encountered
2'				
3'				
4'				
5'				
6'				
7'				
8'				
9'				
10'				
11'				
12'				
13'				
15'				

Boring No. B-7

Plainville, Massachusetts

START DATE: January 2021 BORING DEPTH (bgs): 9' BGS
CONTRACTORS: New England Geotech, Inc.
DRILLERS: Hayes Rembijas
CLIENT: Woodard & Curran G.WATER DEPTH (bgs):
DRILLING METHOD: Geoprobe 6600
SAMPLING METHOD: Macrocore Sampling System

Depth	Sample ID	Rec. Length	PID (ppm)	Field Description and Remarks
0				
	S-1	24"		0-6" Asphalt and subbase
1'				6-18" Medium to coarse brown SAND
				18-24" Fine brown SAND with trace Silt
2'				
	S-2	18"		0-18" Fine brown SAND and Silt with trace Gravel
3'				
4'				
	S-3	24"		0-24" Medium to fine SAND with trace Gravel and Till
5'				
6'				
	S-4	36"		0-36" Compact glacial Till with trace Gravel
7'				Refusal not encountered
				Groundwater not observed in borehole
8'				
9'				
10'				
11'				
12'				
13'				
15'				

Boring No. B-8

Plainville, Massachusetts

START DATE: January 2021 BORING DEPTH (bgs): 9' BGS
CONTRACTORS: New England Geotech, Inc.
DRILLERS: Hayes Rembijas
CLIENT: Woodard & Curran G.WATER DEPTH (bgs):
DRILLING METHOD: Geoprobe 6600
SAMPLING METHOD: Macrocore Sampling System

Depth	Sample ID	Rec. Length	PID (ppm)	Field Description and Remarks
0				
	S-1	24"		0-6" Asphalt and subbase
1'				6-12" Medium to coarse brown SAND
				12-24" Fine brown SAND with trace Silt
2'				
	S-2	24"		0-6" Fine brown SAND and Silt with trace Gravel
3'				6-24" Grey Till with fine to medium SAND and trace Gravel
4'				
	S-3	36"		0-36" Grey Till with trace Gravel
5'				
6'				
	S-4	36"		0-36" Compact glacial Till with trace Gravel
7'				Refusal not encountered
				Groundwater not observed in borehole
8'				
9'				
10'				
11'				
12'				
13'				
15'				

Boring No. P-9

Plainville, Massachusetts

START DATE: January 2021 PROBE DEPTH (bgs): 9' BGS
CONTRACTORS: New England Geotech, Inc.
DRILLERS: Hayes Rembijas
CLIENT: Woodard & Curran G.WATER DEPTH (bgs):
DRILLING METHOD: Geoprobe 6600
SAMPLING METHOD: Macrocore Sampling System

Depth	Sample ID	Rec. Length	PID (ppm)	Field Description and Remarks
0				
				Refusal not encountered
1'				Groundwater not encountered
2'				
3'				
4'				
5'				
6'				
7'				
8'				
9'				
10'				
11'				
12'				
13'				
15'				

Boring No. B-10

Plainville, Massachusetts

START DATE: January 2021 BORING DEPTH (bgs): 9' BGS
CONTRACTORS: New England Geotech, Inc.
DRILLERS: Hayes Rembijas
CLIENT: Woodard & Curran G.WATER DEPTH (bgs):
DRILLING METHOD: Geoprobe 6600
SAMPLING METHOD: Macrocore Sampling System

Depth	Sample ID	Rec. Length	PID (ppm)	Field Description and Remarks
0				
	S-1	24"		0-6" Asphalt and subbase
1'				6-18" Medium to fine brown SAND
				18-24" Gravel
2'				
	S-2	24"		0-12" Gravel
3'				12-24" Fine to medium brown SAND and trace Gravel
4'				
	S-3	30"		0-6" Gravel
5'				6-24" Medium to fine brown SAND and trace Silt
				24-30" Medium to fine brown SAND with trace Gravel
6'				
	S-4	36"		0-36" Medium to fine brown SAND with trace Silt and Gravel
7'				Refusal not encountered
				Groundwater not observed in borehole
8'				
9'				
10'				
11'				
12'				
13'				
15'				

Boring No. P-11

Plainville, Massachusetts

START DATE: January 2021 PROBE DEPTH (bgs): 9' BGS
CONTRACTORS: New England Geotech, Inc.
DRILLERS: Hayes Rembijas
CLIENT: Woodard & Curran G.WATER DEPTH (bgs):
DRILLING METHOD: Geoprobe 6600
SAMPLING METHOD: Macrocore Sampling System

Depth	Sample ID	Rec. Length	PID (ppm)	Field Description and Remarks
0				
				Refusal not encountered
1'				Groundwater not encountered
2'				
3'				
4'				
5'				
6'				
7'				
8'				
9'				
10'				
11'				
12'				
13'				
15'				

Boring No. B-12

Plainville, Massachusetts

START DATE: January 2021 BORING DEPTH (bgs): 9' BGS
CONTRACTORS: New England Geotech, Inc.
DRILLERS: Hayes Rembijas
CLIENT: Woodard & Curran G.WATER DEPTH (bgs): 6' BGS
DRILLING METHOD: Geoprobe 6600
SAMPLING METHOD: Macrocore Sampling System

Depth	Sample ID	Rec. Length	PID (ppm)	Field Description and Remarks
0				
	S-1	24"		0-8" Asphalt and subbase
1'				8-24" Medium to fine brown SAND and trace Gravel
2'				
	S-2	18"		0-6" Medium to fine brown SAND
3'				6-12" Gravel
				12-18" Fine to medium brown SAND with trace Silt and Gravel
4'				
	S-3	24"		0-20" Saturated Grey Till with medium to fine brown Sand and trace Gravel
5'				20-24" Medium to fine brown SAND and trace Silt
6'				
	S-4	30"		0-30" Saturated grey Till with medium to fine brown SAND with trace Gravel
7'				Refusal not encountered
				Groundwater measured @ 6.0' BGS
8'				
9'				
10'				
11'				
12'				
13'				
15'				

Boring No. B-13

Plainville, Massachusetts

START DATE: January 2021 BORING DEPTH (bgs): 9' BGS
CONTRACTORS: New England Geotech, Inc.
DRILLERS: Hayes Rembijas
CLIENT: Woodard & Curran G.WATER DEPTH (bgs):
DRILLING METHOD: Geoprobe 6600
SAMPLING METHOD: Macrocore Sampling System

Depth	Sample ID	Rec. Length	PID (ppm)	Field Description and Remarks
0				
	S-1	24"		0-12" Asphalt and subbase
1'				12-18" Medium to coarse brown SAND and trace Gravel
				18-24" Till with trace fine to medium Sand and Gravel
2'				
	S-2	24"		0-24" Till with trace fine to medium Sand and Gravel
3'				
4'				
	S-3	24"		0-24" Grey Till with medium to fine brown Sand and trace Gravel
5'				
6'				
	S-4	36"		0-6" Grey Till with brown medium to fine SAND with trace Gravel
7'				6-18" Gravel
				18-36" Moist Dark Brown Till and trace Gravel
8'				Refusal not encountered
				Groundwater not encountered
9'				
10'				
11'				
12'				
13'				
15'				

Boring No. B-14

Plainville, Massachusetts

START DATE: January 2021 BORING DEPTH (bgs): 9' BGS
CONTRACTORS: New England Geotech, Inc.
DRILLERS: Hayes Rembijas
CLIENT: Woodard & Curran G.WATER DEPTH (bgs):
DRILLING METHOD: Geoprobe 6600
SAMPLING METHOD: Macrocore Sampling System

Depth	Sample ID	Rec. Length	PID (ppm)	Field Description and Remarks
0				
	S-1	24"		0-6" Asphalt and subbase
1'				6-24" Medium to fine brown SAND and trace Silt
2'				
	S-2	24"		0-24" Fine to medium brown Sand and Silt
3'				Moist @ 4' BGS
4'				
	S-3	36"		0-12" Medium to fine brown Sand and Silt with trace Gravel
5'				12-36" Compact Till
6'				
	S-4	36"		0-36" Weathered Bedrock
7'				
8'				Refusal encountered @ 8' BGS
				Groundwater not encountered
9'				
10'				
11'				
12'				
13'				
15'				

Boring No. P-15

Plainville, Massachusetts

START DATE: January 2021 PROBE DEPTH (bgs): 9' BGS
CONTRACTORS: New England Geotech, Inc.
DRILLERS: Hayes Rembijas
CLIENT: Woodard & Curran G.WATER DEPTH (bgs):
DRILLING METHOD: Geoprobe 6600
SAMPLING METHOD: Macrocore Sampling System

Depth	Sample ID	Rec. Length	PID (ppm)	Field Description and Remarks
0				
				Refusal not encountered
1'				Groundwater not encountered
				Large boulders and cobbles encountered at 6.5' BGS
2'				
3'				
4'				
5'				
6'				
7'				
8'				
9'				
10'				
11'				
12'				
13'				
15'				

Boring No. P-16

Plainville, Massachusetts

START DATE: January 2021 PROBE DEPTH (bgs): 9' BGS
CONTRACTORS: New England Geotech, Inc.
DRILLERS: Hayes Rembijas
CLIENT: Woodard & Curran G.WATER DEPTH (bgs):
DRILLING METHOD: Geoprobe 6600
SAMPLING METHOD: Macrocore Sampling System

Depth	Sample ID	Rec. Length	PID (ppm)	Field Description and Remarks
0				
				Refusal not encountered
1'				Groundwater not encountered
2'				
3'				
4'				
5'				
6'				
7'				
8'				
9'				
10'				
11'				
12'				
13'				
15'				

Boring No. B-17

Plainville, Massachusetts

START DATE: January 2021 BORING DEPTH (bgs): 9' BGS
CONTRACTORS: New England Geotech, Inc.
DRILLERS: Hayes Rembijas
CLIENT: Woodard & Curran G.WATER DEPTH (bgs):
DRILLING METHOD: Geoprobe 6600
SAMPLING METHOD: Macrocore Sampling System

Depth	Sample ID	Rec. Length	PID (ppm)	Field Description and Remarks
0				
	S-1	24"		0-4" Asphalt and subbase
1'				4-12" Medium to fine brown SAND and trace Silt
				12-24" Fine brown SAND with trace Silt
2'				
	S-2	24"		0-24" Fine to medium brown Sand and Silt
3'				
4'				
	S-3	24"		0-12" Medium to fine brown Sand and Silt with trace Gravel
5'				12-24" Medium to fine brown Sand with cobbles
6'				
	S-4	30"		0-24" Medium to fine brown SAND and Silt with cobbles
7'				24-30" Gravel and Cobbles
8'				Refusal not encountered
				Groundwater not encountered
9'				
10'				
11'				
12'				
13'				
15'				

Boring No. P-18

Plainville, Massachusetts

START DATE: January 2021 PROBE DEPTH (bgs): 9' BGS
CONTRACTORS: New England Geotech, Inc.
DRILLERS: Hayes Rembijas
CLIENT: Woodard & Curran G.WATER DEPTH (bgs):
DRILLING METHOD: Geoprobe 6600
SAMPLING METHOD: Macrocore Sampling System

Depth	Sample ID	Rec. Length	PID (ppm)	Field Description and Remarks
0				
				Refusal not encountered
1'				Groundwater not encountered
2'				
3'				
4'				
5'				
6'				
7'				
8'				
9'				
10'				
11'				
12'				
13'				
15'				

Boring No. B-19

Plainville, Massachusetts

START DATE: January 2021 BORING DEPTH (bgs): 9' BGS
CONTRACTORS: New England Geotech, Inc.
DRILLERS: Hayes Rembijas
CLIENT: Woodard & Curran G.WATER DEPTH (bgs):
DRILLING METHOD: Geoprobe 6600
SAMPLING METHOD: Macrocore Sampling System

Depth	Sample ID	Rec. Length	PID (ppm)	Field Description and Remarks
0				
	S-1	30"		0-6" Asphalt and subbase
1'				6-12" Medium to fine dark brown SAND
				12-24" Fine to medium brown SAND with trace gravel
2'				24-30" Gravel and Cobbles with trace medium to fine brown Sand
3'				
4'				
5'				
	S-2	36"		0-6" Brown medium to fine SAND with cobbles and concrete
6'				6-12" Light Brown medium to fine SAND with trace cobbles
				12-36" Medium to fine brown SAND and Silt with cobbles
7'				
8'				Refusal not encountered
				Groundwater not encountered
9'				
10'				
11'				
12'				
13'				
15'				

Boring No. B-20

Plainville, Massachusetts

START DATE: January 2021 BORING DEPTH (bgs): 9' BGS
CONTRACTORS: New England Geotech, Inc.
DRILLERS: Hayes Rembijas
CLIENT: Woodard & Curran G.WATER DEPTH (bgs):
DRILLING METHOD: Geoprobe 6600
SAMPLING METHOD: Macrocore Sampling System

Depth	Sample ID	Rec. Length	PID (ppm)	Field Description and Remarks
0				
	S-1	48"		0-6" Asphalt and subbase
1'				6-42" Medium to brown SAND
				42-48" Coarse to medium brown SAND with trace gravel
2'				
3'				
4'				
5'				
	S-2	30"		0-6" Brown medium to fine SAND with cobbles
6'				6-12" Coarse brown SAND with trace cobbles
				12-24" Medium to coarse brown SAND
7'				24-30" Coarse brown SAND with trace cobbles
8'				Refusal not encountered
				Groundwater not encountered
9'				
10'				
11'				
12'				
13'				
15'				

Boring No. P-21

Plainville, Massachusetts

START DATE: January 2021 PROBE DEPTH (bgs): 9' BGS
CONTRACTORS: New England Geotech, Inc.
DRILLERS: Hayes Rembijas
CLIENT: Woodard & Curran G.WATER DEPTH (bgs): ~3.0' BGS
DRILLING METHOD: Geoprobe 6600
SAMPLING METHOD: Macrocore Sampling System

Depth	Sample ID	Rec. Length	PID (ppm)	Field Description and Remarks
0				
				Refusal not encountered
1'				Groundwater encountered @ ~3.0' BGS
2'				
3'				
4'				
5'				
6'				
7'				
8'				
9'				
10'				
11'				
12'				
13'				
15'				

Boring No. B-22

Plainville, Massachusetts

START DATE: January 2021 BORING DEPTH (bgs): 9' BGS
CONTRACTORS: New England Geotech, Inc.
DRILLERS: Hayes Rembijas
CLIENT: Woodard & Curran G.WATER DEPTH (bgs): 3.0' BGS
DRILLING METHOD: Geoprobe 6600
SAMPLING METHOD: Macrocore Sampling System

Depth	Sample ID	Rec. Length	PID (ppm)	Field Description and Remarks
0				
	S-1	24"		0-6" Asphalt and subbase
1'				6-12" Medium to coarse brown SAND with trace Silt
				12-18" Cobbles and Gravel
2'				18-24" Medium to fine brown SAND with trace Silt
	S-2	18"		
3'				0-6" Medium to fine brown SAND with trace Silt
				6-18" Coarse to medium brown SAND with trace Silt
4'				Water in borehole @ 3.0' BGS
	S-3	24"		0-12" Medium to coarse brown SAND with trace Silt
5'				12-24" Medium to coarse SAND with cobbles and Gravel
6'				
	S-4	36"		0-36" Coarse brown SAND and Gravel
7'				
8'				Refusal not encountered
				Groundwater encountered @ 3.0' BGS
9'				
10'				
11'				
12'				
13'				
15'				

Boring No. B-24

Plainville, Massachusetts

START DATE: January 2021 BORING DEPTH (bgs): 9' BGS
CONTRACTORS: New England Geotech, Inc.
DRILLERS: Hayes Rembijas
CLIENT: Woodard & Curran G.WATER DEPTH (bgs):
DRILLING METHOD: Geoprobe 6600
SAMPLING METHOD: Macrocore Sampling System

Depth	Sample ID	Rec. Length	PID (ppm)	Field Description and Remarks
0				
	S-1	24"		0-6" Asphalt and subbase
1'				6-12" Medium brown SAND with Gravel
				12-18" Fine to medium brown SAND
2'				18-24" Cobbles and Gravel
	S-2	12"		
3'				0-6" Cobbles and Gravel
				6-12" Fine to medium brown SAND
4'				
	S-3	30"		0-24" Medium to fine brown SAND with Till
5'				24-30" Gray fractured bedrock
6'				
	S-4	42"		0-42" Gray fractured bedrock with trace Till
7'				
8'				Refusal not encountered
				Groundwater not encountered
9'				
10'				
11'				
12'				
13'				
15'				

Boring No. P-25

Plainville, Massachusetts

START DATE: January 2021 PROBE DEPTH (bgs): 9' BGS
CONTRACTORS: New England Geotech, Inc.
DRILLERS: Hayes Rembijas
CLIENT: Woodard & Curran G.WATER DEPTH (bgs):
DRILLING METHOD: Geoprobe 6600
SAMPLING METHOD: Macrocore Sampling System

Depth	Sample ID	Rec. Length	PID (ppm)	Field Description and Remarks
0				
				Refusal not encountered
1'				Groundwater not encountered
2'				
3'				
4'				
5'				
6'				
7'				
8'				
9'				
10'				
11'				
12'				
13'				
15'				

Boring No. P-26

Plainville, Massachusetts

START DATE: January 2021 PROBE DEPTH (bgs): 9' BGS
CONTRACTORS: New England Geotech, Inc.
DRILLERS: Hayes Rembijas
CLIENT: Woodard & Curran G.WATER DEPTH (bgs):
DRILLING METHOD: Geoprobe 6600
SAMPLING METHOD: Macrocore Sampling System

Depth	Sample ID	Rec. Length	PID (ppm)	Field Description and Remarks
0				
				Refusal not encountered
1'				Groundwater not encountered
2'				
3'				
4'				
5'				
6'				
7'				
8'				
9'				
10'				
11'				
12'				
13'				
15'				

Boring No. B-27

Plainville, Massachusetts

START DATE: January 2021 BORING DEPTH (bgs): 9' BGS
CONTRACTORS: New England Geotech, Inc.
DRILLERS: Hayes Rembijas
CLIENT: Woodard & Curran G.WATER DEPTH (bgs): 4.0' BGS
DRILLING METHOD: Geoprobe 6600
SAMPLING METHOD: Macrocore Sampling System

Depth	Sample ID	Rec. Length	PID (ppm)	Field Description and Remarks
0				
	S-1	24"		0-12" Asphalt and subbase
1'				12-24" Fine brown SAND with trace Silt
2'				
	S-2	24"		0-20" Fine brown SAND with trace Silt
3'				20-24" Medium to coarse brown SAND with trace cobbles
				Water in borehole @ 4.0' BGS
4'				
	S-3	24"		0-24" Medium to fine brown SAND with Silt and cobbles
5'				
6'				
	S-4	36"		0-12" Medium to coarse brown SAND with trace Silt
7'				12-24" Medium to coarse SAND with trace Silt
				24-36" Fine brown SAND and Silt with trace cobbles
8'				Refusal not encountered
				Groundwater encountered @ 4.0' BGS
9'				
10'				
11'				
12'				
13'				
15'				

Boring No. P-28

Plainville, Massachusetts

START DATE: January 2021 PROBE DEPTH (bgs): 9' BGS
CONTRACTORS: New England Geotech, Inc.
DRILLERS: Hayes Rembijas
CLIENT: Woodard & Curran G.WATER DEPTH (bgs): ~3.5' BGS
DRILLING METHOD: Geoprobe 6600
SAMPLING METHOD: Macrocore Sampling System

Depth	Sample ID	Rec. Length	PID (ppm)	Field Description and Remarks
0				
1'				Refusal not encountered Groundwater encountered @ ~3.5' BGS
2'				
3'				
4'				
5'				
6'				
7'				
8'				
9'				
10'				
11'				
12'				
13'				
15'				

Boring No. B-29

Plainville, Massachusetts

START DATE: January 2021 BORING DEPTH (bgs): 9' BGS
CONTRACTORS: New England Geotech, Inc.
DRILLERS: Hayes Rembijas
CLIENT: Woodard & Curran G.WATER DEPTH (bgs): 26" BGS
DRILLING METHOD: Geoprobe 6600
SAMPLING METHOD: Macrocore Sampling System

Depth	Sample ID	Rec. Length	PID (ppm)	Field Description and Remarks
0				
	S-1	24"		0-12" Asphalt and subbase
1'				12-24" Medium to fine gray SAND with Gravel
2'				
	S-2	24"		0-8" Medium to fine gray SAND
3'				8-24" Medium to fine reddish brown SAND with trace Silt
4'				
	S-3	24"		0-24" Medium to fine reddish brown SAND with trace Silt
5'				12-24" Compact Fine gray SAND and trace Silt
6'				
	S-4	36"		18-36" Weathered black shale
7'				
8'				Refusal not encountered
				Groundwater encountered at 26" BGS
9'				
10'				
11'				
12'				
13'				
15'				

Boring No. P-30

Plainville, Massachusetts

START DATE: January 2021 PROBE DEPTH (bgs): 9' BGS
CONTRACTORS: New England Geotech, Inc.
DRILLERS: Hayes Rembijas
CLIENT: Woodard & Curran G.WATER DEPTH (bgs):
DRILLING METHOD: Geoprobe 6600
SAMPLING METHOD: Macrocore Sampling System

Depth	Sample ID	Rec. Length	PID (ppm)	Field Description and Remarks
0				
				Refusal not encountered
1'				Groundwater not encountered
2'				
3'				
4'				
5'				
6'				
7'				
8'				
9'				
10'				
11'				
12'				
13'				
15'				

Boring No. B-31

Plainville, Massachusetts

START DATE: January 2021 BORING DEPTH (bgs): 9' BGS
CONTRACTORS: New England Geotech, Inc.
DRILLERS: Hayes Rembijas
CLIENT: Woodard & Curran G.WATER DEPTH (bgs):
DRILLING METHOD: Geoprobe 6600
SAMPLING METHOD: Macrocore Sampling System

Depth	Sample ID	Rec. Length	PID (ppm)	Field Description and Remarks
0				
	S-1	24"		0-12" Asphalt and subbase
1'				12-24" Medium to fine brown SAND with trace Silt
2'				
	S-2	24"		0-24" Fine brown SAND and trace Silt
3'				
4'				
	S-3	24"		0-6" fine brown SAND and trace Silt
5'				6-24" Fine to medium gray SAND with trace cobbles
6'				
	S-4	36"		0-30" Fine to medium gray SAND and Silt with trace cobbles
7'				30-36" Cobbles with fine to medium brown SAND
8'				Refusal not encountered
				Groundwater not encountered
9'				
10'				
11'				
12'				
13'				
15'				

Boring No. P-32

Plainville, Massachusetts

START DATE: January 2021 PROBE DEPTH (bgs): 9' BGS
CONTRACTORS: New England Geotech, Inc.
DRILLERS: Hayes Rembijas
CLIENT: Woodard & Curran G.WATER DEPTH (bgs):
DRILLING METHOD: Geoprobe 6600
SAMPLING METHOD: Macrocore Sampling System

Depth	Sample ID	Rec. Length	PID (ppm)	Field Description and Remarks
0				
				Refusal not encountered
1'				Groundwater not encountered
2'				
3'				
4'				
5'				
6'				
7'				
8'				
9'				
10'				
11'				
12'				
13'				
15'				

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SECTION 00 52 10

CONFORMED AGREEMENT

THIS AGREEMENT is by and between Town of Plainville, MA ("Owner") and Gravity Construction, Inc. ("Contractor"). Owner and Contractor hereby agree as follows.

ARTICLE 1 – WORK

1.01 Contractor shall complete all Work as specified or indicated in the Contract Documents. The Work is generally described as providing approximately 7,125 linear feet of 6-inch to 10-inch diameter ductile iron water main on Grove Street, Pleasant Street, Potter Avenue, Lincoln Avenue, Melcher Street, and Witherell Place, including new valves, hydrants, fittings, and appurtenances, replacement of water services, curb stops and curb boxes, temporary bypass piping, temporary and permanent hot-mix asphalt pavement; and all materials, equipment, services and construction inherent to the Work.

ARTICLE 2 – THE PROJECT

2.01 The Project under the Contract Documents is generally known as "Grove St./Pleasant St. Watermain Replacement".

ARTICLE 3 – ENGINEER

3.01 The Project has been designed by Woodard & Curran, Inc. (Engineer), which is to act as Owner's representative, assume all duties and responsibilities and have the rights and authority assigned to Engineer in the Contract Documents in connection with the completion of the Work in accordance with the Contract Documents.

ARTICLE 4 – CONTRACT TIMES

4.01 *Time of the Essence*

A. All time limits for Milestones, if any, Substantial Completion, and completion and readiness for final payment as stated in the Contract Documents are of the essence of the Contract.

4.02 *Substantial Completion and Final Payment*

A. The Work shall be substantially complete within 220 calendar days from the commencement of Contract Times as provided in Paragraph 2.03 of the Standard General Conditions and completed and ready for final payment, in accordance with Paragraph 14.07 of the Standard General Conditions, 465 calendar days from the commencement of Contract Times.

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4.03 *Liquidated Damages*

A. Contractor and Owner recognize that time is of the essence as stated in Paragraph 4.01 above and that Owner will suffer financial loss if the Work is not completed within the times specified in Paragraph 4.02 above, plus any extensions thereof allowed in accordance with Article 12 of the Standard General Conditions and Supplementary Conditions, if any. The parties also recognize the delays, expense, and difficulties involved in proving in a legal or arbitration proceeding the actual loss suffered by Owner if the Work is not completed on time. Accordingly, instead of requiring any such proof, Owner and Contractor agree that as liquidated damages for delay (but not as a penalty), Contractor shall pay Owner **$1,500** for each day that expires after the time specified in Paragraph 4.02 above for Substantial Completion until the Work is substantially complete. After Substantial Completion, if Contractor shall neglect, refuse, or fail to complete the remaining Work within the Contract Time or any proper extension thereof granted by Owner, Contractor shall pay Owner **$1,500** for each day that expires after the time specified in Paragraph 4.02 above for completion and readiness for final payment until the Work is completed and ready for final payment.

ARTICLE 5 – CONTRACT PRICE

5.01 Owner shall pay Contractor for completion of the Work in accordance with the Contract Documents an amount in current funds equal to the sum of the amounts determined pursuant to Paragraph 5.01.A below based on unit pricing stated in Contractor's Bid attached hereto:

TOTAL PRICE

One Million Four Hundred Thirty Two Thousand Four Hundred Twenty Six Dollars and Sixty One Cents	**$1,432,426.61**

A. Unit Prices have been computed in accordance with Paragraph 11.03.A of the Standard General Conditions and Supplementary Conditions, if any.

B. The prices for Unit Price Work set forth as of the Effective Date of the Agreement are based on estimated quantities. As provided in Paragraph 11.03 of the Standard General Conditions and Supplementary Conditions, if any, estimated quantities are not guaranteed (except for those that may be estimated by the Contractor), and determinations of actual quantities and classifications are to be made by Engineer as provided in Paragraph 9.07 of the Standard General Conditions and Supplementary Conditions, if any. Final payment for unit price items will be based on actual quantities determined and based on the unit prices in the Unit Prices Form.

C. When the accepted quantity of any item of Unit Price Work performed by the Contractor (as measured in accordance with 9.07 of the General and Supplementary Conditions, if any) differs from the estimated quantity indicated in the attachment(s) to this Agreement for an item of Unit Price Work, no adjustment or allowance will be made for any increased expenses, loss of expected reimbursement, or loss of anticipated profits suffered or claimed by the Contractor resulting either directly or indirectly from such increased or decreased quantities, or from

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unbalanced allocation of overhead expense among the Unit Price Work items on the part of the Contractor, or subsequent loss of expected reimbursements therefor.

5.02 *Adjustments to the Contract Price*

A. Owner's Contingency(s)

1. Contractor agrees that any Owner's contingency(s) is for the sole use of Owner to cover estimated anticipated costs for certain items.

2. Prior to final payment, an appropriate Change Order will be issued as recommended by Engineer to reflect actual amounts due Contractor on account of Work covered by Owner's contingency(s), and the Contract Price shall be correspondingly adjusted. Contractor shall not receive payment for any unused portion of Owner's contingency(s).

B. Adjustments to the Contract Price will be made for diesel fuel, gasoline, liquid asphalt, and portland cement in cast-in-place concrete based on the Base Prices and index established for adjustments in accordance with price adjustment clauses included in Section 00 73 10, SC-12.01.

ARTICLE 6 – PAYMENT PROCEDURES

6.01 *Submittal and Processing of Payments*

A. Contractor shall submit Applications for Payment in accordance with Article 14 of the Standard General Conditions and Supplementary Conditions, if any. Applications for Payment will be processed by Engineer as provided in the Standard General Conditions and Supplementary Conditions, if any, and the General Requirements.

6.02 *Progress Payments; Retainage*

A. Owner shall make progress payments on account of the Contract Price on the basis of Contractor's Applications for Payment each month during performance of the Work as provided in Paragraph 6.02.A.1 below. All such payments will be measured by the schedule of values established as provided in Paragraph 2.07.A of the Standard General Conditions and Supplementary Conditions, if any, (and in the case of Unit Price Work based on the number of units completed).

1. Prior to Substantial Completion, progress payments will be made in an amount equal to the percentage indicated below but, in each case, less the aggregate of payments previously made and less such amounts as Engineer may determine or Owner may withhold, including but not limited to liquidated damages, in accordance with Paragraph 14.02 of the Standard General Conditions and Supplementary Conditions, if any, and additional retainage allowed by Laws and Regulations.

a. Progress Payments of 95 percent for Work completed (with the balance of 5 percent being retainage); and

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b. 95 percent of cost of materials and equipment not incorporated in the Work (with the balance of 5 percent being retainage).

2. Upon Substantial Completion, Owner shall pay an amount sufficient to increase total payments to Contractor to 99 percent of the Work completed (with the balance of 1 percent being retainage), less such amounts as Engineer shall determine in accordance with Paragraph 14.02.B.5 of the General Conditions and Supplementary Conditions, if any, and less the Engineer's estimate of the value of Work to be completed or corrected as shown on the tentative list of items to be completed or corrected (Punch List) attached to the certificate of Substantial Completion and subject to Paragraph 14.04 of the General Conditions and Supplementary Conditions, if any.

However, retainage for items planted in the ground shall remain at 5 percent of the cost of such items until Final Payment per Massachusetts General Laws Chapter 30, Section 39G.

6.03 *Final Payment*

A. Upon final completion and acceptance of the Work in accordance with Paragraph 14.07 of the General and Supplementary Conditions, if any, Owner shall pay the remainder of the Contract Price as recommended by Engineer as provided in said Paragraph 14.07.

ARTICLE 7 – INTEREST

7.01 All moneys not paid when due as provided in Article 14 of the General and Supplementary Conditions, if any, shall bear interest at the rate 3 percentage points above the rediscount rate then charged by the Federal Reserve Bank of Boston per Massachusetts General Laws Chapter 30, Section 39G. Interest shall not be accrued on retainage.

ARTICLE 8 – CONTRACTOR'S REPRESENTATIONS AND CERTIFICATIONS

8.01 In order to induce Owner to enter into this Agreement, Contractor makes the following representations:

A. Contractor has examined and carefully studied the Contract Documents and the other related data identified in the Bidding Documents.

B. Contractor has visited the Site and become familiar with and is satisfied as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work.

C. Contractor is familiar with and is satisfied as to all federal, state, and local Laws and Regulations that may affect cost, progress, and performance of the Work.

D. Contractor has carefully studied all: (1) reports of explorations and tests of subsurface conditions at or contiguous to the Site and all drawings of physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities), if any, that have been identified in Paragraph SC-4.02 of the Supplementary Conditions as containing reliable "technical data,"

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and (2) reports and drawings of Hazardous Environmental Conditions, if any, at the Site that have been identified in Paragraph SC-4.06 of the Supplementary Conditions as containing reliable "technical data."

E. Contractor has considered the information known to Contractor; information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the Contract Documents; and the Site-related reports and drawings identified in the Contract Documents, with respect to the effect of such information, observations, and documents on (1) the cost, progress, and performance of the Work; (2) the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor, including any specific means, methods, techniques, sequences, and procedures of construction expressly required by the Contract Documents; and (3) Contractor's safety precautions and programs.

F. Based on the information and observations referred to in Paragraph 8.01.E above, Contractor does not consider that further examinations, investigations, explorations, tests, studies, or data are necessary for the performance of the Work at the Contract Price, within the Contract Times, and in accordance with the other terms and conditions of the Contract Documents.

G. Contractor is aware of the general nature of work to be performed by Owner and others at the Site that relates to the Work as indicated in the Contract Documents.

H. Contractor has given Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Contractor has discovered in the Contract Documents, and the written resolution thereof by Engineer is acceptable to Contractor.

I. The Contract Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work.

8.02 The Contractor certifies, under the penalties of perjury, that:

A. Contractor has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for or in executing the Contract. For the purposes of this Paragraph:

1. "corrupt practice" means the offering, giving, receiving, or soliciting of anything of value likely to influence the action of a public official in the bidding process or in the Contract execution;

2. "fraudulent practice" means an intentional misrepresentation of facts made (a) to influence the bidding process or the execution of the Contract to the detriment of Owner, (b) to establish Bid or Contract prices at artificial non-competitive levels, or (c) to deprive Owner of the benefits of free and open competition;

3. "collusive practice" means a scheme or arrangement between two or more Bidders, with or without the knowledge of Owner, a purpose of which is to establish Bid prices at artificial, non-competitive levels; and

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4. "coercive practice" means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the bidding process or affect the execution of the Contract;

B. Contractor certifies no official or employee of the Owner has a financial interest in this Contract or in the expected profit to arise from the Contract, unless the Contractor and Owner, employee or official both have notified public authorities in writing, that the Contractor and the employee fully complied with the provisions of MGL Chapter 43, Section 27 *Interest In Public Contracts By Public Employees Prohibited; Penalty* and provisions of MGL Chapter 268A, Section 20 *Municipal Employees; Financial Interest In Contracts; Holding One Or More Elected Positions*.

C. Contractor has complied with all laws of the Commonwealth of Massachusetts relating to taxes, reporting of employees and contractors, and withholding and remitting of child support and, has provided for itself and each Subcontractor, a Certificate of Good Standing from the Department of Revenue with respect to all returns due and taxes and further, certifies that, to the best of its knowledge and belief, all state tax returns have been filed and all state taxes have been paid as required by Law pursuant to Massachusetts General Laws Chapter 62C, Section 49A.

D. If a foreign corporation, Contractor has provided for itself and each Subcontractor that is a foreign corporation, a certificate of the state secretary stating that the corporation has complied with requirements of Massachusetts General Laws Chapter 156D, Part 15, Section 15.03 of subdivision A and the date of compliance, and further has filed all annual reports required by Section 16.22 of subdivision B of Part 16 of said Chapter 156D, pursuant to Massachusetts General Laws Chapter 30, Section 39L.

E. Contractor is able to furnish labor that can work in harmony with all other elements of labor employed or to be employed in the Work and further certifies that all employees to be employed at the Work Site will have successfully completed a course in construction safety and health approved by the United States Occupational Safety and Health Administration that is at least 10 hours in duration at the time the employee begins Work and shall furnish documentation of successful completion of said course with the first certified payroll report for each employee, all as required by Massachusetts General Laws Chapter 30, Section 39S.

F. Contractor is not presently debarred from entering into a public contract Commonwealth of Massachusetts under the provisions of Massachusetts General Laws Chapter 29, Section 29F, or any other applicable debarment provisions of any other chapter of the General Laws or any rule or regulations promulgated thereunder; and is not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency.

G. Pursuant to Massachusetts General Laws Chapter 30, Section 39R, Contractor has provided a statement by management on internal accounting controls, a statement prepared by an independent certified public accountant regarding management's statement, and an audited financial statement to DCAMM for the most recent completed fiscal year.

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H. Contractor shall not participate in or cooperate with an international boycott, as defined in Section 999 (b)(3) and (4) of the Internal Revenue code 1986, as amended, or engage in conduct declared to be unlawful by Section 2 of Chapter 151E of the Massachusetts General Laws.

8.03 The representations and certifications Contractor submitted with its Bid shall remain valid during the period of this Agreement.

8.04 Contractor agrees to incorporate the applicable provisions of the Contract Documents into all subcontracts and Purchase Orders so that such provisions will be binding upon each Subcontractor or Supplier.

ARTICLE 9 – CONTRACT DOCUMENTS

9.01 *Contents*

A. The Contract Documents consist of the following:

1. This Agreement and attachments

COMPLETE LISTING AFTER AWARD

- Bid Form (submitted by Gravity Construction, Inc. and dated December 28, 2021)
- Bid Supplements and attachments
- Statements on internal accounting controls
- Performance Bond
- Payment Bond
- Certificate of Good Standing from the Department of Revenue with respect to all returns due and taxes
- Insurance certificates

2. Forms listed in 00 60 00

3. Standard General Conditions in Section 00 72 05

4. Supplementary Conditions as listed in Section 00 01 10, Table of Contents

5. General Requirements and Specifications as listed in Section 00 01 10, Table of Contents

6. Drawings listed in Section 00 01 15, List of Drawing Sheets

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7. The following which may be delivered or issued on or after the Effective Date of the Agreement and are not attached hereto:

   a. Notice to Proceed

   b. Work Change Directives

   c. Change Orders

B. The documents listed in Paragraph 9.01.A are attached to this Agreement and made a part hereof.

C. There are no Contract Documents other than those listed above in this Article 9.

D. The Contract Documents may only be amended, modified, or supplemented as provided in Paragraph 3.04 of the Standard General Conditions and Supplementary Conditions, if any.

ARTICLE 10 – MISCELLANEOUS

10.01 *Terms*

A. Terms used in this Agreement will have the meanings stated in the Standard General Conditions and Supplementary Conditions, if any.

10.02 *Assignment of Contract*

A. No assignment by a party hereto of any rights under or interests in the Contract will be binding on another party hereto without the written consent of the party sought to be bound; and, specifically but without limitation, moneys that may become due and moneys that are due may not be assigned without such consent (except to the extent that the effect of this restriction may be limited by law), and unless specifically stated to the contrary in any written consent to an assignment, no assignment will release or discharge the assignor from any duty or responsibility under the Contract Documents.

10.03 *Successors and Assigns*

A. Owner and Contractor each binds itself, its partners, successors, assigns, and legal representatives to the other party hereto, its partners, successors, assigns, and legal representatives in respect to all covenants, agreements, and obligations contained in the Contract Documents.

10.04 *Severability*

A. Any provision or part of the Contract Documents held to be void or unenforceable under any Law or Regulation shall be deemed stricken, and all remaining provisions shall continue to be valid and binding upon Owner and Contractor, who agree that the Contract Documents shall be reformed to replace such stricken provision or part thereof with a valid and enforceable provision that comes as close as possible to expressing the intention of the stricken provision.

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10.05 *Contract is Public Record*

A. The Contract is subject to MGL Chapter 66 et seq, *Public Records*, and as such, related submittals, purchase orders, related pricing documents, and invoices will be public documents, and may be available for public and private distribution, except as specifically excluded. The Contractor agrees to provide the Owner copies of any documents requested under this law at no charge to the Owner or the requestor.

SIGNATURES APPEAR ON THE FOLLOWING PAGE

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IN WITNESS WHEREOF, Owner and Contractor have signed this Agreement. Counterparts have been delivered to Owner and Contractor. All portions of the Contract Documents have been signed or have been identified by Owner and Contractor or on their behalf.

This Agreement will be effective on _____ (which is the Effective Date of the Agreement).

OWNER:
Town of Plainville, MA

By:
Printed Name
Title

By:
Printed Name
Title

Attest:
Title
Address for giving notices:

(If Owner is a corporation, attach evidence of authority to sign. If Owner is a public body, attach evidence of authority to sign and resolution or other documents authorizing execution of this Agreement.)

CONTRACTOR:
Gravity Construction, Inc.

By: President
Thomas P. Murphy
President

License No.

Attest:
Title
Address for giving notices:

Agent for service of process:

(If Contractor is a corporation, a partnership, or a joint venture, attach evidence of authority to sign.)

END OF SECTION

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Approved as to Form by:

_____
Counsel

Pursuant to MGL c.44, s31C, I certify that an appropriation has been made in the total amount of the Agreement.

_____

_____
Owner's Auditor/Accountant (Name)
Date: _____

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SECTION 00 41 01

BID FORM

ARTICLE 1 – DEFINED TERMS

1.01 The terms used in this Bid with initial capital letters have the meanings stated in the Instructions to Bidders, the General Conditions and Supplementary Conditions, if any.

ARTICLE 2 – BID RECIPIENT

2.01 This Bid is submitted to:

Town of Plainville, MA
Plainville Department of Public Works
171 East Bacon Street
Plainville, MA 02762
Attention: Dennis Morton

2.02 The undersigned Bidder proposes and agrees, if this Bid is accepted, to enter into an Agreement with Owner in the form included in the Bidding Documents to perform all Work as specified or indicated in the Bidding Documents for the prices and within the times indicated in this Bid and in accordance with the other terms and conditions of the Bidding Documents.

ARTICLE 3 – BIDDER'S ACKNOWLEDGEMENTS

3.01 Bidder accepts all of the terms and conditions of the Bidding Documents including, without limitation:

A. those dealing with disposition of Bid security;

B. those included in the Supplementary Instructions to Bidders;

C. insurance and bonding requirements (Payment Bond and Performance Bond each equal to 100% of the total Contract Price) set forth in the General Conditions and Supplementary Conditions, if any;

D. Contract Times as set forth in the Agreement; and

E. provisions for liquidated damages as set forth in the Agreement.

3.02 This Bid will remain subject to acceptance for 90 days after the Bid opening or for such longer period of time that Bidder may agree to in writing upon request of Owner.

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3.03 Bidder acknowledges receipt of the following Addenda.

Addendum No.	Addendum Date
1	12/21/21

3.04 Bidder acknowledges the representations and certifications included in Section 00 45 05 are made a condition of the Bid.

ARTICLE 4 – BASIS OF BID

4.01 Bidder will complete the Work in accordance with the Contract Documents for the following price(s) based on unit prices included in Section 00 43 22. The method for determining award is as set forth in Section 00 21 13.

BID PRICES SHALL EXCLUDE SALES AND USE TAX.

TOTAL BID PRICE (from Unit Prices Form)

One million four hundred thirty two thousand four hundred twenty six Dollars and sixty one Cents

(Use words)

$ 1,432,426.61
(Use figures)

4.02 Unit Prices have been computed in accordance with Paragraph 11.03.A of the General Conditions and Supplementary Conditions, if any.

4.03 Bidder acknowledges that estimated quantities are not guaranteed, and are solely for the purpose of comparison of Bids, and final payment for unit price items will be based on actual quantities determined and based on the unit prices included above, as provided in the General Conditions and Supplementary Conditions, if any.

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4.04 Contract Price Adjustments

A. *Owner's Contingency for Materials Escalation Price Adjustment per MGL c30s38A and per Agreement.* Base Prices for diesel fuel, gasoline, liquid asphalt, and portland cement in cast-in-place concrete to be used for Contract Price Adjustments are established in Section 00 73 10, SC-12.01.

ARTICLE 5 – TIME OF COMPLETION

5.01 Bidder agrees that the Work will be substantially complete and will be completed and ready for final payment in accordance with Paragraph 14.07 of the General Conditions and Supplementary Conditions, if any, on or before the dates or within the number of calendar days indicated in the Agreement.

5.02 Bidder accepts the provisions of the Agreement as to liquidated damages.

ARTICLE 6 – ATTACHMENTS TO THIS BID

6.01 The following documents are fully completed, submitted with and made a part of and a condition of this Bid.

☑ 00 43 13 Bid Bond
OR
☐ Required Bid security in the form of _____

Supplements

☑ 00 43 22 Unit Prices Form

☑ 00 43 40 Information, Schedules and Data

☑ 00 45 05 Bidder's Representations and Certifications **including required documents and submittals specified**

☑ 00 45 13 Bidder's Qualifications

☑ 00 45 19 Non-collusion Affidavit

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ARTICLE 7 – BID SUBMITTAL

SUBMITTED ON:	12/28/21
EIN/FEIN:	51-0449050

7.01 This Bid is submitted by:

A Corporation

Corporation Name: Gravity Construction, Inc.

State of incorporation: MA

Type: Service
(General Business, Professional, Service, other)

By: [signature]
(Signature – attach evidence of authority to sign)

Name (*typed or printed*): Thomas P. Murphy

Title: President

(CORPORATE SEAL)
Attest: [signature]
(Signature of Corporate Secretary)

Business Address: 86 Washington St. Unit C2
Plainville, MA

Phone & Facsimile Nos: 508-316-1546 508-316-3348

Email address: gravityconstructioninc@gmail.com

Date of qualification to do business as out-of-state corporation: _____

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SECTION 00 43 22

UNIT PRICES FORM

Provide unit pricing for each Bid item in both words and figures. Provide Bid item totals in figures only.

Discrepancies between the multiplication of units of Work and unit prices will be resolved in favor of the unit prices. Discrepancies between the indicated sum of any column of figures and the correct sum thereof will be resolved in favor of the correct sum. Discrepancies between prices written in words and prices written in figures will be resolved in favor of prices written in words.

Unit Prices have been computed in accordance with Paragraph 11.03.A of the General Conditions and Supplementary Conditions, if any. Estimated quantities are not guaranteed and are solely for the purpose of comparison of Bids, and final payment for unit price items will be based on actual quantities determined and based on the unit prices included below as provided in the General Conditions and Supplementary Conditions, if any.

BID PRICES SHALL EXCLUDE SALES AND USE TAX.

Item No.	Item Description with Unit or Lump Sum Price in Written Words	Estimated Quantity & Unit	Unit Bid Price (Figures)	Total Bid Item Price (Figures)
1	Mobilization/Demobilization @ Sixty thousand Dollars and Zero Cents PER LUMP SUM	1 LS	60,000	60,000
2A	12-inch Cement Lined Ductile Iron Pipe @ One hundred Dollars and Zero Cents PER LINEAR FEET	110 LF	100	11,000
2B	10-inch Cement Lined Ductile Iron Pipe @ One hundred Dollars and Zero Cents PER LINEAR FEET	115 LF	100	11,500
2C	8-inch Cement Lined Ductile Iron Pipe @ Sixty eight Dollars and Zero Cents PER LINEAR FOOT	6,675 LF	68	453,900

Item No.	Item Description with Unit or Lump Sum Price in Written Words	Estimated Quantity & Unit	Unit Bid Price (Figures)	Total Bid Item Price (Figures)
2D	6-inch Cement Lined Ductile Iron Pipe @ Seventy Dollars and Zero Cents PER LINEAR FOOT	200 LF	70	14,000
3A	12-inch Gate Valve, Valve Box and Cover @ Two thousand three hundred fifty Dollars and Zero Cents PER EACH	4 EA	2,350	9,400
3B	10-inch Gate Valve, Valve Box and Cover @ Two thousand Dollars and Zero Cents PER EACH	4 EA	2,000	8,000
3C	8-inch Gate Valve, Valve Box and Cover @ One thousand five hundred Dollars and Zero Cents PER EACH	27 EA	1,500	40,500
3D	6-inch Gate Valve, Valve Box and Cover @ One thousand Dollars and Zero Cents PER EACH	17 EA	1,000	17,000
4A	12-inch x12-inch x 8-inch Cement Lined Ductile Iron Anchor Tee @ Eight hundred Dollars and Zero Cents PER EACH	3 EA	800	2,400
4B	12-inch x12-inch x 6-inch Cement Lined Ductile Iron Anchor Tee @ Eight hundred Dollars and Zero Cents PER EACH	2 EA	800	1,600
4C	10-inch x 10-inch x 8-inch Cement Lined Ductile Iron Anchor Tee @ Eight hundred Dollars and Zero Cents PER EACH	5 EA	800	4,000

Item No.	Item Description with Unit or Lump Sum Price in Written Words	Estimated Quantity & Unit	Unit Bid Price (Figures)	Total Bid Item Price (Figures)
4D	10-inch x 10-inch x 6-inch Cement Lined Ductile Iron Anchor Tee @ Eight hundred Dollars and Zero Cents PER EACH	1 EA	800	800
4E	8-inch x 8-inch x 8-inch Cement Lined Ductile Iron Tee @ Seven hundred eighty five Dollars and Zero Cents PER EACH	8 EA	785	6,280
4F	8-inch x 8-inch x 6-inch Cement Lined Ductile Iron Anchor Tee @ Seven hundred eighty five Dollars and Zero Cents PER EACH	12 EA	785	9,420
5A	8-inch Cement Lined Ductile Iron Cap @ Two hundred Dollars and Zero Cents PER EACH	3 EA	200	600
5B	6-inch Cement Lined Ductile Iron Cap @ One hundred eighty five Dollars and Zero Cents PER EACH	4 EA	185	740
5C	8-inch 45 Degree Cement Lined Ductile Iron Bend @ Four hundred Dollars and Zero Cents PER EACH	12 EA	400	4,800
5D	8-inch 22.5 Degree Cement Lined Ductile Iron Bend @ Four hundred Dollars and Zero Cents PER EACH	6 EA	400	2,400
5E	8-inch 11.25 Degree Cement Lined Ductile Iron Bend @ Four hundred Dollars and Zero Cents PER EACH	3 EA	400	1,200

Item No.	Item Description with Unit or Lump Sum Price in Written Words	Estimated Quantity & Unit	Unit Bid Price (Figures)	Total Bid Item Price (Figures)
6A	10-inch Solid Sleeve @ Five hundred Dollars and zero Cents PER EACH	12 EA	500	6,000
6B	8-inch Solid Sleeve @ Four hundred fifty Dollars and zero Cents PER EACH	20 EA	450	9,000
6C	12-inch x 10-inch Reducer @ Five hundred Dollars and zero Cents PER EACH	4 EA	500	2000
7	Hydrants @ Four thousand three hundred Dollars and zero Cents PER EACH	15 EA	4,300	64,500
8	Disinfection and Pressure Testing @ Five thousand Dollars and zero Cents PER LUMP SUM	1 LS	5,000	5,000
9A	1-inch Type K Copper Tubing (Corporation to Curb Stop) @ Thirty three Dollars and seventy-five Cents PER LINEAR FOOT	2,150 LF	33.75	72,562.50
9B	2-inch Type K Copper Tubing (Corporation to Curb Stop) @ Sixty Dollars and zero Cents PER LINEAR FOOT	40 LF	60	2,400
9C	1-inch Type K Copper Tubing (Curb Stop to Meter) @ One hundred Dollars and zero Cents PER LINEAR FOOT	80 LF	100	8,000

Item No.	Item Description with Unit or Lump Sum Price in Written Words	Estimated Quantity & Unit	Unit Bid Price (Figures)	Total Bid Item Price (Figures)
9D	2-inch Type K Copper Tubing (Curb Stop to Meter) @ One hundred Dollars and Zero Cents PER LINEAR FOOT	80 LF	100	8,000
10A	1-inch Corporation Stop @ Two thousand three hundred Dollars and Zero Cents PER EACH	99 EA	2,300	227,700
10B	2-inch Corporation Stop @ One thousand eight hundred Dollars and Zero Cents PER EACH	2 EA	1,800	3,600
10C	1-inch Curb Stop, Curb Box and Cover @ One hundred Dollars and Zero Cents PER EACH	99 EA	100	9,900
10D	2-inch Curb Stop, Curb Box and Cover @ Two hundred Dollars and Zero Cents PER EACH	2 EA	200	400
11A	4-inch Temporary Water Bypass Piping @ Eleven Dollars and Zero Cents PER LINEAR FOOT	7,300 LF	11	80,300
11B	2-inch Temporary Water Bypass Piping @ Ten Dollars and Zero Cents PER LINEAR FOOT	2,750 LF	10	27,500
11C	Tap Holes for Temporary Bypass System @ One thousand Dollars and Zero Cents PER EACH	6 EA	1,000	6,000

Item No.	Item Description with Unit or Lump Sum Price in Written Words	Estimated Quantity & Unit	Unit Bid Price (Figures)	Total Bid Item Price (Figures)
12A	Unsuitable Materials Below Normal Grade @ One cent Dollars and _____ Cents PER CUBIC YARD	1,350 CY	.01	13.50
12B	Unsuitable Materials Above Normal Grade @ One cent Dollars and _____ Cents PER CUBIC YARD	675 CY	.01	6.75
13	Rock and Boulder Removal @ One hundred Dollars and Zero Cents PER CUBIC YARD	90 CY	100	9,000
14A	Furnish & Install Temporary Trench Pavement @ One hundred fifty Dollars and Zero Cents PER TON	950 TON	150	142,500
14B	Additional Hot Mix Asphalt @ fifty five Dollars and Zero Cents PER TON	120 TON	55	6,600
15A	Remove and Dispose of Existing Hydrants @ Two hundred Dollars and Zero Cents PER EACH	12 EA	200	2,400
15B	Remove and Dispose of Existing Gate Boxes and Covers @ One hundred Dollars and Zero Cents PER EACH	34 EA	100	3,400
15C	Remove and Dispose of Existing Curb Stops, Boxes and Covers @ One cent Dollars and _____ Cents PER EACH	101 EA	.01	1.01

Item No.	Item Description with Unit or Lump Sum Price in Written Words	Estimated Quantity & Unit	Unit Bid Price (Figures)	Total Bid Item Price (Figures)
15D	Remove and Dispose of Existing Water Main @ One cent Dollars and _____Cents PER LINEAR FOOT	7,100 LF	.01	71 -
16	Calcium Chloride for Dust Control @ One cent Dollars and _____Cents PER POUND	1,460 LBS	.01	14.60
17	Inlet Sediment Control Devices @ One hundred Dollars and Zero Cents PER EACH	35 EA	100	3,500
18	Straw Wattles for Erosion Control @ Ten Dollars and Zero Cents PER LINEAR FEET	1,750 LF	10	17,500
19	Test Pits @ Onecent Dollars and _____Cents PER CUBIC YARD	150 CY	.01	1.50
20	3,000 psi Concrete for Thrust Restraint and Encasement @ One cent Dollars and _____Cents PER CUBIC YARD	75 CY	.01	.75
21	Owner's Contingency Allowance for Compaction Testing (per Paragraph 11.02 of the General Conditions) @ **Fifteen Thousand** Dollars and **Zero** Cents NOT TO EXCEED	1 NTE	**$15,000.00**	**$15,000.00**
22	Owner's Contingency Allowance for Contaminated Soil and Groundwater (per Paragraph 11.02 of the General Conditions) @ **Fifteen Thousand** Dollars and **Zero** Cents NOT TO EXCEED	1 NTE	**$15,000.00**	**$15,000.00**

Item No.	Item Description with Unit or Lump Sum Price in Written Words	Estimated Quantity & Unit	Unit Bid Price (Figures)	Total Bid Item Price (Figures)
23	Owner's Contingency Allowance for Materials Escalation (per Paragraph 11.02 of the General Conditions) @ **Twenty-Five Thousand** Dollars and **Zero** Cents NOT TO EXCEED	1 NTE	**$25,000.00**	**$25,000.00**
24	Asbestos Cement Water Main Removal @ One cent Dollars and _____ Cents PER LINEAR FEET	1,500 LF	.01	15-

INCLUDE TOTAL BID PRICE (based on Unit Price Schedule above) ON BID FORM

END OF SECTION

A Limited Liability Company (LLC)

LLC Name: _____

State in which organized: _____

By: _____
(*Signature – attach evidence of authority to sign*)

Name (*typed or printed*): _____

Title: _____

Business Address: _____

_____

Phone & Facsimile Nos: _____

Email address: _____

A Joint Venture

First Joint Venturer Name: _____

By: _____
(*Signature – attach evidence of authority to sign*)

Name (*typed or printed*): _____

Title: _____

Business Address: _____

_____

Phone & Facsimile Nos: _____

Email address: _____

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Second Joint Venturer Name: _____

By: _____
(*Signature – attach evidence of authority to sign*)

Name (*typed or printed*): _____

Title: _____

Business Address: _____

_____

Phone & Facsimile Nos: _____

Email address: _____

(Each joint venturer must sign. The manner of signing for each individual, partnership, corporation and limited liability company that is a party to the joint venture should be in the manner indicated above.)

A Partnership

Partnership Name: _____ (SEAL)

By: _____
(*Signature of general partner – attach evidence of authority to sign*)

Name (*typed or printed*): _____

Business Address: _____

_____

Phone & Facsimile Nos: _____

Email address: _____

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An Individual

Name (*typed or printed*): _____

By: _____
(*Individual's signature*)

Doing business as: _____

Business Address: _____

_____

Phone & Facsimile Nos: _____

Email address: _____

_____

COMMUNICATIONS WITH BIDDER CONCERNING THIS BID SHALL BE ADDRESSED TO:

Name	Thomas P. Murphy
Title	President
Business Address	86 Washington St. Unit C2
	Plainville, MA
Telephone No.	508-316-1546
Facsimile No.	508-316-3348
Email address	gravityconstructioninc@gmail.com

END OF SECTION

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SECTION 00 43 40

INFORMATION, SCHEDULES AND DATA

SCHEDULE

Provide a proposed Project Schedule based on a Notice to Proceed on approximately April 11, 2022, a Substantial Completion within 220 days from the commencement of Contract Time, and final completion within 465 days from the commencement of Contract Time. The schedule shall be presented in sufficient detail for the Owner to evaluate the Bidder's ability to perform the Work within the Contract Times and shall include:

- milestones related to submittal schedules, procurement, construction, and checkout & functional testing; and
- sequencing to limit impacts from construction.

WORK PLAN

Submit a narrative work plan describing the Bidder's approach to the successful execution of the Work to accommodate the proposed Project Schedule and provide for special requirements. Allow for review of submittals, coordination, and development of detailed construction sequencing and coordination; and compliance with special requirements.

Describe:

- how schedule progress will be measured and tracked;
- how the Schedule of Values and cash flow will be determined and how progress for payment will be determined; and
- how documents will be controlled to assure that the appropriate revision is used in design, procurement, and construction/installation.

END OF SECTION

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Preliminary Schedule for Construction

Grove Street-Plainville

Week #1 April 4-8, 2022
Work to be performed:

1. Install bypass Grove Street

Week #2 April 11-15, 2022
Work to be performed:

1. Bypass Pleasant Street & Testing bypass

Week #3 April 18-21, 2022
Work to be performed:

1. Testing bypass & installing bypass on Lincoln Ave.
2. Bypass Lincoln Ave & Melcher St
3. Bypass Lincoln & testing bypass

Week #4 April 25-29, 2022

1. Install main from station 1+0 to 5+0 Grove St.
2. Install main from station 5+0 to 8+0 Grove St.
3. Install main from station 8+0 to 10+50 Grove St.
4. Install main from station 10+50 to 13+0 Grove St. and pave trench Grove St.

Week #5 May 2-6, 2022
Work to be performed:

1. Install main from station 14+00 to 17+00 Grove St.
2. Install main from station 17+00 to 19+94 Grove St.
3. Tie in @ East Bacon St. & Pleasant St.
4. Install main on Pleasant St. station 1+0 to 4+0
5. Install main from station 4+0 to 6+0 and trench patch Pleasant St.

Week #6 May 9-13, 2022
Work to be performed:

1. Install main on Pleasant St. from station 6+0 to 9+0
2. Install main on Pleasant St. from station 9+0 to12+0
3. Install main on Pleasant St. from station 12+0 to 15+0
4. Install main on Pleasant St. from station 15+0 to 17+26
5. Trench patch & install hydrants

Week #7 May 16-20, 2022
Work to be performed:

1. Tie in @ Pleasant St. & South St. Fill and test Pleasant St.
2. Install bypass on Potter St.
3. Install bypass on Potter St. & cut in hydrant
4. Test bypass, cut in hydrant on Potter St. Tie in @ Lincoln Ave
5. Pave trenches

Week #8 May 23-27, 2022
Work to be performed:

1. Install main on Lincoln Ave. from station 1+0 to 3+0
2. Install main on Lincoln Ave. from station 3+0 to 6+0

3. Install main on Lincoln Ave. from station 6+0 to 3+0
4. Install main on Lincoln Ave. from station 3+0 to 0+0
5. Fill, test and pave trench

Week #9 May 30-June 3, 2022
Work to be performed:

1. Tie in South St. & Lincoln Ave
2. Start services on Grove St.
3. Services Grove St.
4. Services Grove St.
5. Service Grove St, & pave trenches

Week #10 June 6-10, 2022
Work to be performed:

1. Services on Grove St.
2. Services on Grove St.
3. Install main on Melcher St.
4. Install main on Melcher St.
5. Pave trenches, install by pass on Witherall Place

Week #11 June 13-17 2022
Work to be performed:

1. Services on Pleasant St.
2. Services on Pleasant St.
3. Services on Pleasant St.
4. Services on Pleasant St.
5. Services and pave trenches

Week #12 June 20-24, 2022
Work to be performed:

1. Services on Lincoln Ave.
2. Services on Lincoln Ave
3. Services on Lincoln Ave
4. Services on Lincoln Ave
5. Pave trenches

Week #13 June 27- July 1, 2022
Work to be performed:

1. Tie in @ East Bacon St. & Potter Ave
2. Install main on Potter Ave. station 1+0 to 4+0
3. Install main on Potter Ave. station 4+0 to 5+78
4. Fill, test and pave trenches
5. Clean up and pave for Holiday

Week #14 July 6-8, 2022
Work to be performed:

1. Install main on Witherell
2. Install main on Witherell
3. Install main on Witherell and pave trenches

SECTION 00 45 05

BIDDER'S REPRESENTATIONS AND CERTIFICATIONS

The undersigned, under the penalties of perjury, represents and certifies the following which is made a condition of the Bid.

1.01 BIDDER'S REPRESENTATIONS

A. Bidder has examined and carefully studied the Bidding Documents and other related data identified in the Bidding Documents.

B. Bidder has visited the Site and become familiar with and is satisfied as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work.

C. Bidder is familiar with and is satisfied as to all Laws and Regulations that may affect cost, progress, and performance of the Work.

D. Bidder has carefully studied all: (1) reports of explorations and tests of subsurface conditions at or contiguous to the Site and all drawings of physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities) that have been identified in Section 00 73 10 of the Supplementary Conditions Paragraph 4.02 as containing reliable "technical data," and (2) reports and drawings of Hazardous Environmental Conditions, if any, at the Site that have been identified in Section 00 73 10 of the Supplementary Conditions Paragraph 4.06 as containing reliable "technical data."

E. Bidder has considered the information known to Bidder; information and observations obtained from visits to the Site; the Bidding Documents; and the Site-related reports and drawings identified in the Bidding Documents, with respect to the effect of such information, observations, and documents on (1) the cost, progress, and performance of the Work; (2) the means, methods, techniques, sequences, and procedures of construction to be employed by Bidder, including applying the specific means, methods, techniques, sequences, and procedures of construction expressly required by the Bidding Documents; and (3) Bidder's safety precautions and programs.

F. Based on the information and observations referred to in Paragraph E above, Bidder does not consider that further examinations, investigations, explorations, tests, studies, or data are necessary for the determination of the Bid for performance of the Work at the price(s) bid and within the times required, and in accordance with the other terms and conditions of the Bidding Documents.

G. Bidder is aware of the general nature of work to be performed by Owner and others at the Site that relates to the Work as indicated in the Bidding Documents.

H. Bidder has given Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Bidder has discovered in the Bidding Documents, and the written resolution thereof by Engineer is acceptable to Bidder.

I. The Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for the performance of the Work for which the Bid is submitted.

1.02 BIDDER'S CERTIFICATIONS

A. The Bid is genuine and not made in the interest of or on behalf of any undisclosed individual or entity and is not submitted in conformity with any collusive agreement or rules of any group, association, organization, or corporation.

B. Bidder has not directly or indirectly induced or solicited any other Bidder to submit a false or sham Bid and has not solicited or induced any individual or entity to refrain from bidding.

C. Bidder has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for the Contract. For the purposes of this Paragraph:

1. "corrupt practice" means the offering, giving, receiving, or soliciting of anything of value likely to influence the action of a public official in the bidding process;

2. "fraudulent practice" means an intentional misrepresentation of facts made (a) to influence the bidding process to the detriment of Owner, (b) to establish Bid prices at artificial non-competitive levels, or (c) to deprive Owner of the benefits of free and open competition;

3. "collusive practice" means a scheme or arrangement between two or more Bidders, with or without the knowledge of Owner, a purpose of which is to establish Bid prices at artificial, non-competitive levels; and

4. "coercive practice" means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the bidding process or affect the execution of the Contract.

D. Bidder will comply with the requirements of the Contract Documents, and if Bidder is awarded a Contract, agrees to incorporate applicable provisions into all subcontracts and Purchase Orders so that such provisions will be binding upon each Subcontractor or Supplier, including as a minimum, Statutory Requirements, safety and health regulations; and Wage Rate Requirements.

1.03 BIDDER'S CERTIFICATIONS REQUIRED BY MASSACHUSETTS GENERAL LAW (MGL)

A. The Bid is in all respects bona fide, fair and made without collusion or fraud with any other person. As used in this paragraph the word "person" shall mean any natural person, joint venture, partnership, corporation or other business or legal entity.

B. Bidder certifies no official or employee of the Owner has a financial interest in this Contract or in the expected profit to arise from the Contract, unless the Bidder and Owner, employee or official both have notified public authorities in writing, that the Bidder and the employee fully complied with the provisions of MGL Chapter 43, Section *27 Interest In Public Contracts By Public Employees Prohibited; Penalty* and provisions of MGL Chapter 268A, Section 20 *Municipal Employees; Financial Interest In Contracts; Holding One Or More Elected Positions.*

C. Bidder has submitted a certificate from the Secretary of State of the Commonwealth of Massachusetts that the corporation has complied with requirements of Section 15.03 of subdivision A of Part 15 of MGL Chapter 156D and the date of compliance, and further has filed all annual reports required by Section 16.22 of subdivision B of Part 16 of said Chapter 156D if Bidder is a foreign corporation. Bidder certifies it will provide such certificate for each Subcontractor that is a foreign corporation if it receives a Notice of Intent to Award.

D. Bidder certifies, under the penalties of perjury, to the best of its knowledge and belief, that all state tax returns have been filed and all state taxes paid pursuant to MGL Chapter 62C, Section 49A, and has submitted a Certificate of Good Standing with respect to all returns due and taxes from the Commonwealth of Massachusetts Department of Revenue certifying Bidder has complied with all laws relating to taxes, reporting of employees and contractors, and withholding and remitting of child support. Bidder certifies it will provide such certificate for each Subcontractor if it receives a Notice of Intent to Award.

E. Bidder certifies that if awarded the Contract, the following will be submitted prior to execution of the Agreement in accordance with MGL Chapter 30, Section 39R *Definitions; contract provisions; management and financial statements; enforcement.*

- To Owner - A statement by management on internal accounting control and a statement prepared by an independent certified public accountant regarding management's statement; and
- To DCAMM - An audited financial statement for the most recent completed fiscal year.

F. Bidder certifies that if awarded the Contract, any Work involving the removal, containment, or encapsulation of asbestos or material containing asbestos will only be performed by a licensed contractor in accordance with MGL Chapter 149, Section 6B and any sheet metal Work will be performed by a contractor licensed in accordance with 271 CMR 1.00, et seq. governing licensing, permitting, and sheet metal work in Massachusetts.

G. Bidder is able to furnish labor that can work in harmony with all other elements of labor employed or to be employed in the Work and further certifies that all employees to be employed at the Work Site will have successfully completed a course in construction safety and health approved by the United States Occupational Safety and Health Administration that is at least 10 hours in duration at the time the employee begins Work and if Bidder is awarded a Contract, shall furnish documentation of successful completion of said course with the first certified payroll report for each employee.

H. Bidder is not presently debarred from bidding on or entering into a public contract in the Commonwealth of Massachusetts under the provisions of MGL Chapter 29, Section 29F, or any other applicable debarment provisions of any other chapter of the MGL or any rule or regulations promulgated thereunder; and is not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency.

I. Bidder understands the Bid is subject to MGL Chapter 66 et seq, *Public Records*, and as such, related submittals, purchase orders, related pricing documents, and invoices will be public documents, and may be available for public and private distribution, except as specifically excluded. The Bidder agrees to provide the Owner copies of any documents requested under this law at no charge to the Owner or the requestor.

J. Bidder will comply with the Commonwealth of Massachusetts and Federal COVID-19 guidelines and procedures for the construction sector (as may be amended).

SUBMITTED ON: 12/27/21
By: *Authorized person per Bid Form*

END OF SECTION

SECTION 00 45 13

BIDDER'S QUALIFICATIONS

The following data, statements of experience, personnel, equipment and general qualifications are submitted as a part of the Bid and the Bidder represents and guarantees the truthfulness and accuracy thereof and **its ability to meet the qualifications requirements specified in Section 01 43 05 and the Specifications**. Attach additional sheets as necessary properly cross referenced.

1.01 GENERAL

A. Bidder's organization is a Corp (entity type) and has been in business continuously from the year _____.

Bidder has operated under the same business name and organization structure for the last 5 years on at least 5 projects ☑ yes ☐ no

If no, indicate other business names: _____

B. Bidder's organization has had experience in construction comparable to that required by the Contract Documents as a prime contractor for 18 years and as a subcontractor for _____ years.

1.02 CONTRACTOR EXPERIENCE

A. Identify at least 5 water main replacement projects within the past 5 years, each of which: (a) has been completed by the date of the Bid opening; (b) includes water main replacement work that was solely completed by the Bidder and valued at $500,000 or greater, exclusive of change order work; (c) completed in the same state as the Project covered by the Contract Documents. The scope of work completed solely by the Bidder for each reference project submitted shall include, at a minimum: furnishing and installing ductile iron water main pipe greater than 8-inches in diameter for distribution systems servicing a population greater than 9,000; and furnishing, installing and 24-hour maintenance of temporary water main systems with bypass piping 4-inches or greater in diameter and temporary service connections.

Client/Owner Name/Address	Project Name/Location	CURRENT Contact Name, Phone, Email	Contract Value	Time Period
	See attached			

RY

Gravity Construction Inc.
Recent projects

8/26/2021 3:13 PM

Year	Project	Location	Contact		Description	Cost
2021	Town of Cohasset	Cohasset	Jason Federico	781-783-5068	Water Main Replacement	$362,500.00
2021	Town of North Attleborough	North Attleboro	Mark Hollowell	508-695-9621	Water Main Replacement	$1,289,702.64
2020	Holliston & Brentwood St Town of Medway	Medway	Cindy Blodin	(978) 880-2483	Water Main Improvement	$1,816,114.51
2020	Hedge St. Town of Fairhaven	Fairhaven	Jim Coe	978-657-9714	Water, Sewer & Drainage Imp	$452,750.26
2020	Kelly Blvd Water Booster Pump Station	Plainville	Andrew Dennehy	781-255-1982	Water Booster Pump Station	$547,000.00
2019	Holmes St. Town of Norton	Norton	Tara McManus	978-532-1900	Water Main Improvement	$246,673.92
2019	City of Taunton RTPD	Taunton	Christopher Thomas	617-896-4368	Utility Improvement - Pump Station	$486,453.26
2019	Town of Plainville Pump Station	Plainville	Art Leventis	978-557-8150	Pump Station Rehabilitation	$348,447.00
2019	School St. Town of Plainville	Plainville	Art Leventis	978-557-8150	8" DI Water Main Replacement	$705,727.01
2018	Cliff Dr. Town of Freetown	Freetown	Jim Noyes	774-218-2076	Drainage Improvements	$245,085.75
2018	Lakeview Ave Town of Bellingham	Bellingham	Don DiMartino	508-966.5813	12" DI Water Main replacement	$278,062.70
2018	Resevoir St Town of Norton	Norton	Andrea David	978-532-1900	8" DI Water Main Improvement	$661,068.14
2018	Town of Plainville Phase II Water Main	Plainville	Bob Chappell	781-251-0200	8" DI Water Main Replacement	$752,553.01
2018	Town of Sharon Suffolk Rd Emergency WM	Sharon	Ryan Trahan	(617) 657-0253	6" DI Water Main Emergency Replace	$119,889.87
2018	Town of Cohasset	Cohasset	Jason Federico	781-783-5068	8" DI Water Main Replacement	$171,829.54
2017	Jeanette St, Fairhaven	Fairhaven	Vincent Furtado	508-979-4030	8" and 12" drainage pipe replacement	$85,628.63
2017	Wrentham Rd, Bellingham	Bellingham	Don DiMartino	(508) 966-5813	8" DI Water Main Replacement	$446,380.39
2017	Spring St, Plainville	Plainville	Bob Chappell	781-251-0200	6" & 8" Water Main Replacement	$558,562.78
2017	Hydrant Replace 2017	Waltham	John Pizzi	781-389-7947	Hydrant and gate replacement	$265,143.89
2016	Brook Rd & East Foxboro	Sharon	Ryan Trahan	(617) 657-0253	6" &12" Water Main Improvement	$1,037,931.07
2015	Maple St & Cottage St.	Plainville	Bob Chappell	781-251-0200	8" & 12" Water Main replacement	$390,118.32
2015	East St, Utility Replacement & Road Recon	North Attleboro	Bill McDowell	508-643-6636	6" Water Main & Replace 8" CLDI	$895,720.40
2015	Winthrop St Water Main Replacement	Medway	Dave D'Amico	(508) 533-3275	12" DI Water Main replacement	$1,510,119.60
2015	Hydrant Replacement Main St	Fairhaven	Edward Fortin	(508) 979-4030	Hydrant and gate replacement	$141,990.01
2015	Cliff Rd, Hartford Ave Water Main Imp	Bellingham	Don DiMartino	(508) 966-5813	8",10" PVC and DI Water Main Improvem	$367,723.03
2014	Highland, Harpin, Mill St Water Main	Bellingham	Don DiMartino	(508) 966-5813	8" & 6" DI and PVC Water Main replacer	$379,974.44
2014	Billings Street, Water Main Replace	Sharon	Ryan Trahan	(617) 657-0253	8" 6" & 12"DI Water Main replacement	$484,108.61
2014	Adams & Village St Water Main	Medway	Cindy Blodin	(978) 880-2483	8" & 12" DI Water Main replacement	$1,093,401.50
2013	Glendale Rd/Massapoag Ave Water Main	Sharon	Ryan Trahan	(617) 657-0253	8" & 12" Water Main replacement	$1,065,000.00
2013	Willow Street Drainage Improvements	North Attleboro	Bill McDowell	(508) 643-6636	Drainage improvements	$84,000.00
2013	Smith Street Water Main	North Attleboro	Bill McDowell	(508) 643-6636	8" Water Main replacement	$800,000.00
2013	Water Line Upgrade	Wrentham	Tom Diplacido	(508) 384-6324	16" Water Main replacement	$150,000.00
2013	Needham Water Service Replacement	Needham	Needham	(781) 455-7580	Water service replacement	$355,000.00
2012	Smith Street Water Main	Waltham	John Pizzi	(781) 389-7947	12" Water Main replacement	$315,000.00
2012	North Street Drain	Mattapoisett	Jon Connell	(508) 965-8709	Water and Drain upgrade	$242,346.00
2010	Farnum Road Benefit Street	Waltham	John Pizzi	(781) 389-7947	Sewer water drain curb sidewalks road	$1,079,851.87
2010	Private inflow removal	Waltham	John Pizzi	(781) 389-7947	Reroute sump pumps	$425,295.50
2010	Abbott Run Valley	North Attleboro	Bill McDowell	(508) 643-6636	Drainage improvements	$408,641.07
2010	City of Waltham City Yard	Waltham	Bernie McDonald	781-858-5728	Various road construction	$1,000,004.00

1.03 PROPOSED DESIGN PROFESSIONALS AND SURVEYORS

A. The following design professionals and surveyors are to be employed or retained by the Bidder and available for assignment to the Project.

Name	Address	Area of Responsibility	Years of Experience

B. Attach detailed resumes of qualifications, previous employers and experience for each design professional and surveyor listed above.

1.04 CURRENT LICENSES

A. Indicate Bidder and Subcontractor(s) current licenses including design professionals and surveyors.

Name	State	Type	License number

1.05 SPECIALTY EXPERIENCE OF BIDDER OR SUBCONTRACTORS

A. Identify at least 5 projects that included pavement and street repair within public streets within the last 10 years.

Client/Owner Name/Address	Project Name/Location	CURRENT Contact Name, Phone, Email	Bidder or Subcontractor (Name)	Time Period
	See Attached			

1.06 PERSONNEL

A. Identify supervisory personnel that are currently employed by the Bidder and available for assignment to the Project (project manager, superintendents, principal foremen and engineers). Identify full-time on-Site project manager in responsible charge of the Work with at least 10 years' experience as project manager on comparable projects.

Name	Title	Years of Experience
	Full time, on-Site Project Manager	Minimum 10 years
Tom [illegible]	Owner	25
Jim [illegible]	Superintendent	25

B. Attach detailed resumes of qualifications, previous employers and experience for each supervisory staff listed above.

1.07 EMERGENCY RESPONSE CAPABILITIES

A. Describe Bidder's 24 hour/7 days per week emergency response and communication capabilities. Attach additional documentation as necessary.

We Are located in the Town of Plainville and are availabl 24/7

1.08 EQUIPMENT

A. Identify equipment available for use on the Project. Indicate whether owned by Bidder's organization or rented. Attach additional sheets as necessary.

Type of Equipment	Size or Capacity	Owned or Rented
Volvo ECR 305 exc.	75,000 lb	owned
Volvo ECR 145	32,000 lb	owned
PC 138 exc.	30,000 lb	owned
4 Dump Trucks		owned
Volvo HL 90	4 yd loader	owned
Volvo L120	5 yd loader	owned
Komatsu 320 loader	4 yd	owned

1.09 BUSINESS INTERESTS

A. Identify the names and addresses of the members of the Board of Directors of corporation, or the names and addresses of all persons and parties interested in this Bid as partners of a partnership or as individuals. Attach additional sheets as necessary.

Name	Address	Telephone No.
Thomas P. Murphy	26 Fales Rd Plainville	781-858-6862

B. Identify the bank or banks representing the financial responsibility of the Bidder.

Name of Bank	Address	Contact Name and Telephone No.
Dedham Svgs Bank	55 Elm St Dedham MA	

1.10 VIOLATIONS

A. Following is a list of violations Bidder and its main Subcontractors have received or been the subject of, or otherwise been involved in, regarding any state or local ethic laws, regulation, code, ordinance, policy, or standard, or offenses arising out of submission of bids or the performance of work on public works projects or contracts over the last ten 10 years. Attach additional sheets as necessary.

Name and Location of the Project	
Nature of the Violation/Offense	
Duration and dates during which the violation/offense took place	
Name and Location of the Project	N/A
Nature of the Violation/Offense	
Duration and dates during which the violation/offense took place	
Name and Location of the Project	
Nature of the Violation/Offense	
Duration and dates during which the violation/offense took place	
Name and Location of the Project	
Nature of the Violation/Offense	
Duration and dates during which the violation/offense took place	

1.11 LABOR DISPUTES

A. Identify labor disputes the Bidder has been the subject of, or otherwise been involved in, during the last 5 years. For these purposes, "labor disputes" shall include picketing or any other activity which disrupted or delayed the work. Attach additional sheets as necessary.

Name and Location of the Project	
Nature of the Dispute	
Duration and dates during which the dispute took place	
How the dispute was resolved	NA
Name and Location of the Project	
Nature of the Dispute	
Duration and dates during which the dispute took place	
How the dispute was resolved	

END OF SECTION

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Thomas P Murphy

gravityconstructioninc@gmail.com • 26 Fales Rd. Street Plainville, MA • 781-858-6867

Experience

Gravity Construction, Inc | 86 Washington St. Unit C2 Plainville, MA 02762

Utility Contracting: Sitework * Sewer * Water main * Drainage * Septic * Excavating

Owner/Supervisor – Oct 2003 to current

On site manager

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SECTION 00 45 19

NON-COLLUSION AFFIDAVIT

Thomas P. Murphy, being duly sworn, depose and, under the penalty of perjury, say that the following is true:

1. I am the person responsible within my firm for the final decision as to the price(s) and amount of this Bid or, if not, that I have written authorization, enclosed herewith, from that person to make the statements set out below on his or her behalf and on the behalf of my firm.

2. The price(s) and amount of this Bid have been arrived at independently, without collusion, consultation, communication, or agreement for the purpose of restricting competition with any other contractor, competitor, Bidder, or potential Bidder.

3. Unless otherwise required by law, neither the price(s) nor the amount of this Bid have been disclosed to any other firm or person who is a Bidder, competitor, or potential Bidder on the Project, and will not be so disclosed either directly or indirectly prior to Bid opening.

4. No attempt has been made or will be made to solicit, cause, or induce any firm, partnership, corporation, or person to submit or not submit a Bid on this Project, or to submit a Bid higher than the Bid of this firm, or submit an intentionally high or noncompetitive Bid or other form of complementary Bid, or for the purpose of restricting competition.

5. The Bid of my firm is made in good faith and not pursuant to any agreement or discussion with, or inducement from, any firm or person to submit a complementary Bid.

6. My firm has not offered or entered into a subcontracting agreement regarding the purchase of materials or services from any firm or person, or offered, promised, or paid cash or anything of value to any firm or person, whether in connection with this or any other Project, in consideration for an agreement or promise by any firm or person to refrain from proposing or to submit a complementary Bid on the Project.

7. My firm has not accepted nor been promised any subcontract or agreement regarding the sale of materials or services to any firm or person, and has not been promised or paid cash or anything of value to any firm or person, whether in connection with this or any other project, in consideration for my firm's submitting a complementary Bid or agreeing to do so, on the Project.

8. I have made a diligent inquiry of all members, officers, employees, and agents of my firm with responsibilities relating to the preparation, approval, or submission of my firm's Bid on the Project and have been advised by each of them that he or she has not participated in any communication, consultation, discussion, agreement, collusion, act, or other conduct inconsistent with any of the statements and representations made in this affidavit.

Gravity Construction, Inc.
Company Name

Signature

President
Company Position

Date: 12/28/21

Attest: Doreen Clouter

Date: 12/28/21

END OF SECTION

The Commonwealth of Massachusetts

Secretary of the Commonwealth

State House, Boston, Massachusetts 02133

William Francis Galvin
Secretary of the
Commonwealth

January 5, 2022

TO WHOM IT MAY CONCERN:

I hereby certify that according to the records of this office,

GRAVITY CONSTRUCTION, INC.

is a domestic corporation organized on **February 6, 2003**, under the General Laws of the Commonwealth of Massachusetts.

I further certify that there are no proceedings presently pending under the Massachusetts General Laws Chapter 156D section 14.21 for said corporation's dissolution; that articles of dissolution have not been filed by said corporation; that, said corporation has filed all annual reports, and paid all fees with respect to such reports, and so far as appears of record said corporation has legal existence and is in good standing with this office.

In testimony of which,
I have hereunto affixed the
Great Seal of the Commonwealth
on the date first above written.

William Francis Galvin

Secretary of the Commonwealth

Processed By: TAA

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Darren R. McGinn, CPA, P.C.
Certified Public Accountants
Accredited in Business Valuation

February 10, 2022

Town Administrator
Town of Plainville, Massachusetts
142 South Street, PO Box 1717
Plainville, MA 02762

RE: Grove Street and Pleasant Street
Water Main Improvements

Dear Town Administrator:

Please be advised that we have reviewed the Statement of Internal Accounting Controls prepared by Gravity Construction, Inc. in connection with the above-captioned project, as required under M.G.L. c.30 §39R. In our opinion, representations of management are consistent with our evaluations of the system of internal accounting controls and such representations are, in addition, reasonable with respect to transactions and assets in amounts which would be material when measured in relation to the Gravity Construction, Inc.'s financial statements.

Sincerely,

Vincent A. Armstrong, CPA
Darren R. McGinn CPA, PC

20 Forsyth Ave. So. Yarmouth, MA 02664 Phone: 508.827.4648 Fax: 508.827.4649
Phone: 508.732.9970

TOM MURPHY,
PRESIDENT

GRAVITY CONSTRUCTION, INC.

Phone (508) 316-1546
Fax: (508) 316-3348

P.O. BOX 193 S. WALPOLE, MA 02071

Date: February 10, 2022

Board of Water and Sewer Commissioners
171 East Bacon Street
P.O. Box 1565
Plainville, MA 02762

RE: Grove Street and Pleasant Street Water Main Improvements

Dear Board Members,

This letter is being submitted pursuant to MGL Chapter 30 39R(c). Please be advised that our firm has a system of internal accounting controls which assure that:

(1) transactions are executed in accordance with the management's general and specific authorization;
(2) transactions are recorded as necessary, to permit preparation of financial statements in conformity with the generally accepted accounting principles, and to maintain accountability for assets
(3) access to assets is permitted only in accordance with management's general or specific authorization; and
(4) the recorded accountability for assets is compared with the existing assets at reasonable intervals and appropriate action was taken with respect to any difference.

Sincerely,

_____

Thomas P. Murphy, President

EJCDC
ENGINEERS JOINT CONTRACT DOCUMENTS COMMITTEE

PERFORMANCE BOND

CONTRACTOR *(name and address)*:
Gravity Construction Inc
86 Washington Street Unit C2
Plainville MA 02762

SURETY *(name and address of principal place of business)*:
Great Midwest Insurance Company
800 Gessner Ste. 600
Houston, TX 77024

OWNER *(name and address)*:
Town of Plainville
190 South Street
Plainville MA 02762

CONSTRUCTION CONTRACT
Effective Date of the Agreement:
Amount: One Million Four Hundred Thirty Two Thousand Four Hundred Twenty Six and 61/100 ($1,432,426.61)
Description *(name and location)*:
Grove Street and Pleasant Street Water Main Improvements

BOND
Bond Number: GM213190
Date *(not earlier than the Effective Date of the Agreement of the Construction Contract)*:
Amount: One Million Four Hundred Thirty Two Thousand Four Hundred Twenty Six and 61/100 ($1,432,426.61)
Modifications to this Bond Form: [X] None [ ] See Paragraph 16

Surety and Contractor, intending to be legally bound hereby, subject to the terms set forth below, do each cause this Performance Bond to be duly executed by an authorized officer, agent, or representative.

CONTRACTOR AS PRINCIPAL	SURETY
Gravity Construction Inc *(seal)*	Great Midwest Insurance Company *(seal)*
Contractor's Name and Corporate Seal	Surety's Name and Corporate Seal
By: _____	By: _____
Signature	Signature *(attach power of attorney)*
_____	Gail M Paling
Print Name	Print Name
_____	Attorney-in-Fact
Title	Title
Attest: _____	Attest: _____
Signature	Signature
_____	Witness
Title	Title

Notes: (1) Provide supplemental execution by any additional parties, such as joint venturers. (2) Any singular reference to Contractor, Surety, Owner, or other party shall be considered plural where applicable.

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1. The Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to the Owner for the performance of the Construction Contract, which is incorporated herein by reference.

2. If the Contractor performs the Construction Contract, the Surety and the Contractor shall have no obligation under this Bond, except when applicable to participate in a conference as provided in Paragraph 3.

3. If there is no Owner Default under the Construction Contract, the Surety's obligation under this Bond shall arise after:

3.1 The Owner first provides notice to the Contractor and the Surety that the Owner is considering declaring a Contractor Default. Such notice shall indicate whether the Owner is requesting a conference among the Owner, Contractor, and Surety to discuss the Contractor's performance. If the Owner does not request a conference, the Surety may, within five (5) business days after receipt of the Owner's notice, request such a conference. If the Surety timely requests a conference, the Owner shall attend. Unless the Owner agrees otherwise, any conference requested under this Paragraph 3.1 shall be held within ten (10) business days of the Surety's receipt of the Owner's notice. If the Owner, the Contractor, and the Surety agree, the Contractor shall be allowed a reasonable time to perform the Construction Contract, but such an agreement shall not waive the Owner's right, if any, subsequently to declare a Contractor Default;

3.2 The Owner declares a Contractor Default, terminates the Construction Contract and notifies the Surety; and

3.3 The Owner has agreed to pay the Balance of the Contract Price in accordance with the terms of the Construction Contract to the Surety or to a contractor selected to perform the Construction Contract.

4. Failure on the part of the Owner to comply with the notice requirement in Paragraph 3.1 shall not constitute a failure to comply with a condition precedent to the Surety's obligations, or release the Surety from its obligations, except to the extent the Surety demonstrates actual prejudice.

5. When the Owner has satisfied the conditions of Paragraph 3, the Surety shall promptly and at the Surety's expense take one of the following actions:

5.1 Arrange for the Contractor, with the consent of the Owner, to perform and complete the Construction Contract;

5.2 Undertake to perform and complete the Construction Contract itself, through its agents or independent contractors;

5.3 Obtain bids or negotiated proposals from qualified contractors acceptable to the Owner for a contract for performance and completion of the Construction Contract, arrange for a contract to be prepared for execution by the Owner and a contractor selected with the Owners concurrence, to be secured with performance and payment bonds executed by a qualified surety equivalent to the bonds issued on the Construction Contract, and pay to the Owner the amount of damages as described in Paragraph 7 in excess of the Balance of the Contract Price incurred by the Owner as a result of the Contractor Default; or

5.4 Waive its right to perform and complete, arrange for completion, or obtain a new contractor, and with reasonable promptness under the circumstances:

5.4.1 After investigation, determine the amount for which it may be liable to the Owner and, as soon as practicable after the amount is determined, make payment to the Owner; or

5.4.2 Deny liability in whole or in part and notify the Owner, citing the reasons for denial.

6. If the Surety does not proceed as provided in Paragraph 5 with reasonable promptness, the Surety shall be deemed to be in default on this Bond seven days after receipt of an additional written notice from the Owner to the Surety demanding that the Surety perform its obligations under this Bond, and the Owner shall be entitled to enforce any remedy available to the Owner. If the Surety proceeds as provided in Paragraph 5.4, and the Owner refuses the payment or the Surety has denied liability, in whole or in part, without further notice the Owner shall be entitled to enforce any remedy available to the Owner.

7. If the Surety elects to act under Paragraph 5.1, 5.2, or 5.3, then the responsibilities of the Surety to the Owner shall not be greater than those of the Contractor under the Construction Contract, and the responsibilities of the Owner to the Surety shall not be greater than those of the Owner under the Construction Contract. Subject to the commitment by the Owner to pay the Balance of the Contract Price, the Surety is obligated, without duplication for:

7.1 the responsibilities of the Contractor for correction of defective work and completion of the Construction Contract;

7.2 additional legal, design professional, and delay costs resulting from the Contractor's Default, and resulting from the actions or failure to act of the Surety under Paragraph 5; and

7.3 liquidated damages, or if no liquidated damages are specified in the Construction Contract, actual damages caused by delayed performance or non-performance of the Contractor.

8. If the Surety elects to act under Paragraph 5.1, 5.3, or 5.4, the Surety's liability is limited to the amount of this Bond.

9. The Surety shall not be liable to the Owner or others for obligations of the Contractor that are unrelated to the Construction Contract, and the Balance of the Contract Price shall not be reduced or set off on account of any such unrelated obligations. No right of action shall accrue on this Bond to any person or entity other than the Owner or its heirs, executors, administrators, successors, and assigns.

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10. The Surety hereby waives notice of any change, including changes of time, to the Construction Contract or to related subcontracts, purchase orders, and other obligations.

11. Any proceeding, legal or equitable, under this Bond may be instituted in any court of competent jurisdiction in the location in which the work or part of the work is located and shall be instituted within two years after a declaration of Contractor Default or within two years after the Contractor ceased working or within two years after the Surety refuses or fails to perform its obligations under this Bond, whichever occurs first. If the provisions of this paragraph are void or prohibited by law, the minimum periods of limitations available to sureties as a defense in the jurisdiction of the suit shall be applicable.

12. Notice to the Surety, the Owner, or the Contractor shall be mailed or delivered to the address shown on the page on which their signature appears.

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

14. Definitions

14.1 Balance of the Contract Price: The total amount payable by the Owner to the Contractor under the Construction Contract after all proper adjustments have been made including allowance for the Contractor for any amounts received or to be received by the Owner in settlement of insurance or other claims for damages to which the Contractor is entitled, reduced by all valid and proper payments made to or on behalf of the Contractor under the Construction Contract.

14.2 Construction Contract: The agreement between the Owner and Contractor identified on the cover page, including all Contract Documents and changes made to the agreement and the Contract Documents.

14.3 Contractor Default: Failure of the Contractor, which has not been remedied or waived, to perform or otherwise to comply with a material term of the Construction Contract.

14.4 Owner Default: Failure of the Owner, which has not been remedied or waived, to pay the Contractor as required under the Construction Contract or to perform and complete or comply with the other material terms of the Construction Contract.

14.5 Contract Documents: All the documents that comprise the agreement between the Owner and Contractor.

15. If this Bond is issued for an agreement between a contractor and subcontractor, the term Contractor in this Bond shall be deemed to be Subcontractor and the term Owner shall be deemed to be Contractor.

16. Modifications to this Bond are as follows:

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EJCDC
ENGINEERS JOINT CONTRACT DOCUMENTS COMMITTEE

PAYMENT BOND

CONTRACTOR *(name and address)*:
Gravity Construction Inc
86 Washington Street Unit C2
Plainville MA 02762

SURETY *(name and address of principal place of business)*:
Great Midwest Insurance Company
800 Gessner Ste. 600
Houston, TX 77024

OWNER *(name and address)*: Town of Plainville
190 South Street, Plainville MA 02762

CONSTRUCTION CONTRACT
Effective Date of the Agreement:
Amount: One Million Four Hundred Thirty Two Thousand Four Hundred Twenty Six and 61/100 ($1,432,426.61)
Description *(name and location)*:
Grove Street and Pleasant Street Water Main Improvements

BOND
Bond Number: GM213190
Date *(not earlier than the Effective Date of the Agreement of the Construction Contract)*:
Amount: One Million Four Hundred Thirty Two Thousand Four Hundred Twenty Six and 61/100 ($1,432,426.61)
Modifications to this Bond Form: [X] None [ ] See Paragraph 18

Surety and Contractor, intending to be legally bound hereby, subject to the terms set forth below, do each cause this Payment Bond to be duly executed by an authorized officer, agent, or representative.

CONTRACTOR AS PRINCIPAL	SURETY
Gravity Construction Inc *(seal)*	Great Midwest Insurance Company *(seal)*
Contractor's Name and Corporate Seal	Surety's Name and Corporate Seal
By: _____	By: _____
Signature	Signature *(attach power of attorney)*
_____	Gail M Paling
Print Name	Print Name
_____	Attorney-in-Fact
Title	Title
Attest: _____	Attest: _____
Signature	Signature
_____	Witness
Title	Title

Notes: (1) Provide supplemental execution by any additional parties, such as joint venturers. (2) Any singular reference to Contractor, Surety, Owner, or other party shall be considered plural where applicable.

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1. The Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to the Owner to pay for labor, materials, and equipment furnished for use in the performance of the Construction Contract, which is incorporated herein by reference, subject to the following terms.

2. If the Contractor promptly makes payment of all sums due to Claimants, and defends, indemnifies, and holds harmless the Owner from claims, demands, liens, or suits by any person or entity seeking payment for labor, materials, or equipment furnished for use in the performance of the Construction Contract, then the Surety and the Contractor shall have no obligation under this Bond.

3. If there is no Owner Default under the Construction Contract, the Surety's obligation to the Owner under this Bond shall arise after the Owner has promptly notified the Contractor and the Surety (at the address described in Paragraph 13) of claims, demands, liens, or suits against the Owner or the Owner's property by any person or entity seeking payment for labor, materials, or equipment furnished for use in the performance of the Construction Contract, and tendered defense of such claims, demands, liens, or suits to the Contractor and the Surety.

4. When the Owner has satisfied the conditions in Paragraph 3, the Surety shall promptly and at the Surety's expense defend, indemnify, and hold harmless the Owner against a duly tendered claim, demand, lien, or suit.

5. The Surety's obligations to a Claimant under this Bond shall arise after the following:

   5.1 Claimants who do not have a direct contract with the Contractor,

      5.1.1 have furnished a written notice of non-payment to the Contractor, stating with substantial accuracy the amount claimed and the name of the party to whom the materials were, or equipment was, furnished or supplied or for whom the labor was done or performed, within ninety (90) days after having last performed labor or last furnished materials or equipment included in the Claim; and

      5.1.2 have sent a Claim to the Surety (at the address described in Paragraph 13).

   5.2 Claimants who are employed by or have a direct contract with the Contractor have sent a Claim to the Surety (at the address described in Paragraph 13).

6. If a notice of non-payment required by Paragraph 5.1.1 is given by the Owner to the Contractor, that is sufficient to satisfy a Claimant's obligation to furnish a written notice of non-payment under Paragraph 5.1.1.

7. When a Claimant has satisfied the conditions of Paragraph 5.1 or 5.2, whichever is applicable, the Surety shall promptly and at the Surety's expense take the following actions:

   7.1 Send an answer to the Claimant, with a copy to the Owner, within sixty (60) days after receipt of the Claim, stating the amounts that are undisputed and the basis for challenging any amounts that are disputed; and

   7.2 Pay or arrange for payment of any undisputed amounts.

   7.3 The Surety's failure to discharge its obligations under Paragraph 7.1 or 7.2 shall not be deemed to constitute a waiver of defenses the Surety or Contractor may have or acquire as to a Claim, except as to undisputed amounts for which the Surety and Claimant have reached agreement. If, however, the Surety fails to discharge its obligations under Paragraph 7.1 or 7.2, the Surety shall indemnify the Claimant for the reasonable attorney's fees the Claimant incurs thereafter to recover any sums found to be due and owing to the Claimant.

8. The Surety's total obligation shall not exceed the amount of this Bond, plus the amount of reasonable attorney's fees provided under Paragraph 7.3, and the amount of this Bond shall be credited for any payments made in good faith by the Surety.

9. Amounts owed by the Owner to the Contractor under the Construction Contract shall be used for the performance of the Construction Contract and to satisfy claims, if any, under any construction performance bond. By the Contractor furnishing and the Owner accepting this Bond, they agree that all funds earned by the Contractor in the performance of the Construction Contract are dedicated to satisfy obligations of the Contractor and Surety under this Bond, subject to the Owner's priority to use the funds for the completion of the work.

10. The Surety shall not be liable to the Owner, Claimants, or others for obligations of the Contractor that are unrelated to the Construction Contract. The Owner shall not be liable for the payment of any costs or expenses of any Claimant under this Bond, and shall have under this Bond no obligation to make payments to or give notice on behalf of Claimants, or otherwise have any obligations to Claimants under this Bond.

11. The Surety hereby waives notice of any change, including changes of time, to the Construction Contract or to related subcontracts, purchase orders, and other obligations.

12. No suit or action shall be commenced by a Claimant under this Bond other than in a court of competent jurisdiction in the state in which the project that is the subject of the

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Construction Contract is located or after the expiration of one year from the date (1) on which the Claimant sent a Claim to the Surety pursuant to Paragraph 5.1.2 or 5.2, or (2) on which the last labor or service was performed by anyone or the last materials or equipment were furnished by anyone under the Construction Contract, whichever of (1) or (2) first occurs. If the provisions of this paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.

13. Notice and Claims to the Surety, the Owner, or the Contractor shall be mailed or delivered to the address shown on the page on which their signature appears. Actual receipt of notice or Claims, however accomplished, shall be sufficient compliance as of the date received.

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

15. Upon requests by any person or entity appearing to be a potential beneficiary of this Bond, the Contractor and Owner shall promptly furnish a copy of this Bond or shall permit a copy to be made.

16. **Definitions**

16.1 **Claim:** A written statement by the Claimant including at a minimum:

1. The name of the Claimant;
2. The name of the person for whom the labor was done, or materials or equipment furnished;
3. A copy of the agreement or purchase order pursuant to which labor, materials, or equipment was furnished for use in the performance of the Construction Contract;
4. A brief description of the labor, materials, or equipment furnished;
5. The date on which the Claimant last performed labor or last furnished materials or equipment for use in the performance of the Construction Contract;
6. The total amount earned by the Claimant for labor, materials, or equipment furnished as of the date of the Claim;
7. The total amount of previous payments received by the Claimant; and
8. The total amount due and unpaid to the Claimant for labor, materials, or equipment furnished as of the date of the Claim.

16.2 **Claimant:** An individual or entity having a direct contract with the Contractor or with a subcontractor of the Contractor to furnish labor, materials, or equipment for use in the performance of the Construction Contract. The term Claimant also includes any individual or entity that has rightfully asserted a claim under an applicable mechanic's lien or similar statute against the real property upon which the Project is located. The intent of this Bond shall be to include without limitation in the terms of "labor, materials, or equipment" that part of the water, gas, power, light, heat, oil, gasoline, telephone service, or rental equipment used in the Construction Contract, architectural and engineering services required for performance of the work of the Contractor and the Contractor's subcontractors, and all other items for which a mechanic's lien may be asserted in the jurisdiction where the labor, materials, or equipment were furnished.

16.3 **Construction Contract:** The agreement between the Owner and Contractor identified on the cover page, including all Contract Documents and all changes made to the agreement and the Contract Documents.

16.4 **Owner Default:** Failure of the Owner, which has not been remedied or waived, to pay the Contractor as required under the Construction Contract or to perform and complete or comply with the other material terms of the Construction Contract.

16.5 **Contract Documents:** All the documents that comprise the agreement between the Owner and Contractor.

17. If this Bond is issued for an agreement between a contractor and subcontractor, the term Contractor in this Bond shall be deemed to be Subcontractor and the term Owner shall be deemed to be Contractor.

18. Modifications to this Bond are as follows:

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POWER OF ATTORNEY

Great Midwest Insurance Company

KNOW ALL MEN BY THESE PRESENTS, that **GREAT MIDWEST INSURANCE COMPANY**, a Texas Corporation, with its principal office in Houston, TX, does hereby constitute and appoint:

Joseph J. Lane, Gail M. Paling

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

This authority is made under and by the authority of a resolution which was passed by the Board of Directors of **GREAT MIDWEST INSURANCE COMPANY**, on the 1st day of October, 2018 as follows:

Resolved, that the President, or any officer, be and hereby is, authorized to appoint and empower any representative of the Company or other person or persons as Attorney-In-Fact to execute on behalf of the Company any bonds, undertakings, policies, contracts of indemnity or other writings obligatory in nature of a bond not to exceed Fifteen Million dollars ($15,000,000.00), which the Company might execute through its duly elected officers, and affix the seal of the Company thereto. Any said execution of such documents by an Attorney-In-Fact shall be as binding upon the Company as if they had been duly executed and acknowledged by the regularly elected officers of the Company. Any Attorney-In-Fact, so appointed, may be removed in the Company's sole discretion and the authority so granted may be revoked as specified in the Power of Attorney.

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

IN WITNESS THEREOF, **GREAT MIDWEST INSURANCE COMPANY**, has caused this instrument to be signed by its President, and its Corporate Seal to be affixed this 11th day of February, 2021.

GREAT MIDWEST INSURANCE COMPANY

GREAT MIDWEST INSURANCE COMPANY — CORPORATE SEAL — TEXAS CORPORATION

BY Mark W. Haushill

Mark W. Haushill
President

ACKNOWLEDGEMENT

On this 11th day of February, 2021, before me, personally came Mark W. Haushill to me known, who being duly sworn, did depose and say that he is the President of **GREAT MIDWEST INSURANCE COMPANY**, the corporation described in and which executed the above instrument; that he executed said instrument on behalf of the corporation by authority of his office under the By-laws of said corporation.

NOTARY PUBLIC — STATE OF TEXAS
CHRISTINA BISHOP
Notary Public, State of Texas
Comm. Expires 04-14-2025
Notary ID 131090488

BY

Christina Bishop
Notary Public

CERTIFICATE

I, the undersigned, Secretary of **GREAT MIDWEST INSURANCE COMPANY**, A Texas Insurance Company, DO HEREBY CERTIFY that the original Power of Attorney of which the foregoing is a true and correct copy, is in full force and effect and has not been revoked and the resolutions as set forth are now in force.

Signed and Sealed at Houston, TX this _____ Day of February, 2022.

GREAT MIDWEST INSURANCE COMPANY — CORPORATE SEAL — TEXAS CORPORATION

BY

Leslie K. Shaunty
Secretary

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

CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY): 3/7/2022

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must have ADDITIONAL INSURED provisions or be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER Eastern Insurance Group, LLC. 233 West Central Street Natick MA 01760	**CONTACT NAME:** Barbara LeBlanc **PHONE (A/C, No, Ext):** 508-923-2494 **FAX (A/C, No):** 781-598-8445 **E-MAIL ADDRESS:** BLeBlanc@easterninsurance.com
INSURED 212248 Gravity Construction Inc 86 Washington Street Plainville MA 02762	**INSURER(S) AFFORDING COVERAGE** / **NAIC #** **INSURER A :** Selective Ins Co of Southeast / 39926 **INSURER B :** Nautilus Insurance Co / 17370 **INSURER C :** **INSURER D :** **INSURER E :** **INSURER F :**

COVERAGES **CERTIFICATE NUMBER:** 1793044399 **REVISION NUMBER:**

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL INSD	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS	
A	X **COMMERCIAL GENERAL LIABILITY**			S 2394018	8/26/2021	8/26/2022	EACH OCCURRENCE	$ 1,000,000
	[ ] CLAIMS-MADE [X] OCCUR						DAMAGE TO RENTED PREMISES (Ea occurrence)	$ 500,000
	X CONTRACTUAL LIAB						MED EXP (Any one person)	$ 15,000
	X XCU INCLUDED						PERSONAL & ADV INJURY	$ 1,000,000
	GEN'L AGGREGATE LIMIT APPLIES PER:						GENERAL AGGREGATE	$ 3,000,000
	[ ] POLICY [X] PRO-JECT [X] LOC						PRODUCTS - COMP/OP AGG	$ 3,000,000
	[ ] OTHER:							$
A	**AUTOMOBILE LIABILITY**			A 9107331	8/26/2021	8/26/2022	COMBINED SINGLE LIMIT (Ea accident)	$ 1,000,000
	X ANY AUTO						BODILY INJURY (Per person)	$
	[ ] OWNED AUTOS ONLY [ ] SCHEDULED AUTOS						BODILY INJURY (Per accident)	$
	X HIRED AUTOS ONLY X NON-OWNED AUTOS ONLY						PROPERTY DAMAGE (Per accident)	$
								$
A	X **UMBRELLA LIAB** X OCCUR			S 2394018	8/26/2021	8/26/2022	EACH OCCURRENCE	$ 5,000,000
	EXCESS LIAB [ ] CLAIMS-MADE						AGGREGATE	$ 5,000,000
	[ ] DED X RETENTION $ 10,000							$
	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY Y / N						[ ] PER STATUTE [ ] OTH-ER	
	ANYPROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? [ ] **(Mandatory in NH)**	N / A					E.L. EACH ACCIDENT	$
	If yes, describe under DESCRIPTION OF OPERATIONS below						E.L. DISEASE - EA EMPLOYEE	$
							E.L. DISEASE - POLICY LIMIT	$
B	POLLUTION LIABILITY			CPP202999911	9/1/2021	9/1/2022	EACH OCCURRENCE AGGREGATE	1,000,000 1,000,000

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)

Additional Insured coverage is provided on a primary and non-contributory basis with respect to General Liability, Auto Liability and Excess Liability where required by written contract. A waiver of Subrogation applies under General Liability, Auto Liability and Umbrella Liability where required by written contract.
Grove St./Pleasant St. Watermain Replacement
ADDITIONAL INSURED: Town of Plainville, MA; Woodard & Curran (Engineer)

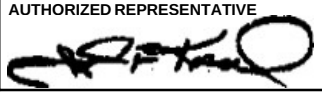
CERTIFICATE HOLDER

TOWN OF PLAINVILLE
190 SOUTH STREET
P.O. BOX 1717
PLAINVILLE MA 02762

CANCELLATION

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.

AUTHORIZED REPRESENTATIVE



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Commonwealth of Massachusetts
Department of Revenue
Christopher C. Harding, Commissioner

mass.gov/dor

Letter ID: L0 #######
Notice Date:
Case ID: 0-000- ##-##

CERTIFICATE OF GOOD STANDING AND/OR TAX COMPLIANCE

Why did I receive this notice?

The Commissioner of Revenue certifies that, as of the date of this certificate, **COMPANY NAME** is in compliance with its tax obligations under Chapter 62C of the Massachusetts General Laws.

This certificate doesn't certify that the taxpayer is compliant in taxes such as unemployment insurance administered by agencies other than the Department of Revenue, or taxes under any other provisions of law.

This is not a waiver of lien issued under Chapter 62C, section 52 of the Massachusetts General Laws.

What if I have questions?

If you have questions, call us at (617) 887-6367 or toll-free in Massachusetts at (800) 392-6089, Monday through Friday, 8:30 a.m. to 4:30 p.m..

Visit us online!

Visit mass.gov/dor to learn more about Massachusetts tax laws and DOR policies and procedures, including your Taxpayer Bill of Rights, and MassTaxConnect for easy access to your account:

- Review or update your account
- Contact us using e-message
- Sign up for e-billing to save paper
- Make payments or set up autopay

Edward W. Coyle Jr

Edward W. Coyle, Jr., Chief
Collections Bureau

SECTION 00 60 00

PROJECT FORMS

The following forms are included in this Section and shall be used for the Project as specified in the General Conditions and Supplementary Conditions if any, and the General Requirements. Completed and execution versions of these forms used during the Project shall be incorporated into the Agreement and made a part thereof.

Submittal Transmittal (Form C-00 62 11)
Application for Payment (Form C-00 62 76)
Request for Interpretation/Information (Form C-00 63 15)
Field Order (Form C-00 63 36)
Work Change Directive (Form C-00 63 49)
Change Request (Form C- 00 63 60)
Change Order (Form C-00 63 63 MA)
Notice of Substantial Completion (Form C-00 65 15)
Certificate of Substantial Completion (Form C-00 65 16)
Notice of Completion (Form C-00 65 18)

END OF SECTION

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SUBMITTAL TRANSMITTAL (Form C-00 62 11)

Owner:		Transmittal No.:	
Project:		Date:	
Contract No.:			
Contract Title:			
Specification Section No.:			

Assign a consecutive, unique number to each submittal and use same on resubmittals. For "Revision", A =original submittal; B = 1st resubmittal; C (and beyond) = additional resubmittals

Submittal (Item) No.	Revision (A B C etc.)	Date	Title/Description	Vendor/Manufacturer	Copies

☐ The material and equipment, and requirements for construction/installation contained in Submittal No.(s) _____ have been reviewed and we certify that they are correct and in strict conformance with the requirements specified (no exceptions or deviations)

☐ The material and equipment and requirements for construction/installation contained in Submittal No.(s) _____ have been reviewed and we certify that they are correct and in strict conformance with the requirements specified except for the following deviations (list below or attach listing):

_____

_____

CONTRACTOR'S NAME_____

ADDRESS_____

BY: _____ DATE: _____

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EJCDC
ENGINEERS JOINT CONTRACT DOCUMENTS COMMITTEE

FORM C-00 62 76

Contractor's Application for Payment No. _____

	Application Period:	Application Date:
To (Owner):	From (Contractor):	Via (Engineer):
Project:	Contract:	
Owner's Contract No.:	Contractor's Project No.:	Engineer's Project No.:

Application For Payment

Change Order Summary

Approved Change Orders		
Number	Additions	Deductions
TOTALS		
NET CHANGE BY CHANGE ORDERS		

1. ORIGINAL CONTRACT PRICE	**$** _____
2. Net change by Change Orders	**$** _____
3. Current Contract Price (Line 1 ± 2)	**$** _____
4. TOTAL COMPLETED AND STORED TO DATE (Column F on Progress Estimate)	**$** _____
5. RETAINAGE:	
a. X _____ Work Completed	**$** _____
b. X _____ Stored Material	**$** _____
c. Total Retainage (Line 5a + Line 5b)	**$** _____
6. AMOUNT ELIGIBLE TO DATE (Line 4 - Line 5c)	**$** _____
7. LESS PREVIOUS PAYMENTS (Line 6 from prior Application)	**$** _____
8. AMOUNT DUE THIS APPLICATION	**$** _____
9. BALANCE TO FINISH, PLUS RETAINAGE (Column G on Progress Estimate + Line 5 above)	**$** _____

Contractor's Certification

The undersigned Contractor certifies that to the best of its knowledge: (1) all previous progress payments received from Owner on account of Work done under the Contract have been applied on account to discharge Contractor's legitimate obligations incurred in connection with Work covered by prior Applications for Payment; (2) title of all Work, materials and equipment incorporated in said Work or otherwise listed in or covered by this Application for Payment will pass to Owner at time of payment free and clear of all Liens, security interests and encumbrances (except such as are covered by a Bond acceptable to Owner indemnifying Owner against any such Liens, security interest or encumbrances); and (3) all Work covered by this Application for Payment is in accordance with the Contract Documents and is not defective.

By:	Date:

Payment of: $ _____
(Line 8 or other - attach explanation of the other amount)

is recommended by: _____ _____
(Engineer) (Date)

Payment of: $ _____
(Line 8 or other - attach explanation of the other amount)

is approved by: _____ _____
(Owner) (Date)

Approved by: _____ _____
Funding Agency (if applicable) (Date)

Approved by: _____ _____

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Progress Estimate - Lump Sum Work

FORM C-00 62 76

Contractor's Application

For (Contract):	Application Number:
Application Period:	Application Date:

			Work Completed		E	F		G
A		B	C	D	Materials Presently Stored (not in C or D)	Total Completed and Stored to Date (C + D + E)	% (F / B)	Balance to Finish (B - F)
Specification Section No.	Description	Scheduled Value ($)	From Previous Application (C+D)	This Period				

Progress Estimate - Unit Price Work

FORM C-00 62 76

Contractor's Application

For (Contract):	Application Number:
Application Period:	Application Date:

A				B	B(2)	C	D	E	F		
Item		Bid Item Quantity	Unit Price	Bid Item Value ($)	Estimated Quantity Installed This Month	Estimated Quantity Installed To Date (Include This Month)	Value of Work Installed to Date	Materials Presently Stored (not in C)	Total Completed and Stored to Date (D + E)	% (F / B)	Balance to Finish (B - F)
Bid Item No.	Description										
	moblize										
	Totals										

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Stored Material Summary FORM C-00 62 76

Contractor's Application

For (Contract):								Application Number:			
Application Period:								Application Date:			
A		B	C		D		E		F		G
Bid Item No.	Supplier Invoice No.	Submittal No. (with Specification Section No.)	Storage Location	Description of Materials or Equipment Stored	Stored Previously		Amount Stored this Month ($)	Subtotal Amount Completed and Stored to Date (D + E)	Incorporated in Work		Materials Remaining in Storage ($) (D + E - F)
					Date Placed into Storage (Month/Year)	Amount ($)			Date (Month/ Year)	Amount ($)	
				Totals							

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REQUEST FOR INTERPRETATION/INFORMATION (Form C-00 63 15)

RFI #: _____ ☐ **Attachment**

To: _____ From: _____

Attn: _____ Issue Date: _____

Project: _____ Required Reply Date: _____

DISTRIBUTION:

Contractor	Owner	Engineer
☐ _____	☐ _____	☐ _____
☐ _____	☐ _____	☐ _____
☐ _____	☐ _____	☐ _____

REFERENCES:

- Specifications: _____ Section: _____ Page/Paragraph: _____
- Drawings: _____ Issue Date: _____ Detail/Sections: _____
- Work Area: _____ Grid/Level: _____

RFI DESCRIPTION:

From: _____ Tel No: _____ Fax: No: _____

Initial: _____ E-mail: _____

RFI REPLY: (response may be transmitted in separate document)

Possible Cost Effect Yes: ☐ No: ☐ **Possible Schedule Effect** Yes: ☐ No: ☐

From: _____ Reply Date: _____ xc: _____

Initial: _____ _____

Based on: CASE Form B-1999

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Field Order (C-00 63 36)

No. _____

Date of Issuance: _____ Effective Date: _____

Project:	Owner:	Owner's Contract No.:
Contract:		Date of Contract:
Contractor:		Engineer's Project No.:

Attention:
You are hereby directed to promptly execute this Field Order issued in accordance with General Conditions Paragraph 9.04.A, for minor changes in the Work without changes in Contract Price or Contract Times. If you consider that a change in Contract Price or Contract Times is required, please notify the Engineer immediately and before proceeding with this Work.

Reference: _____ _____
(Specification Section(s)) (Drawing(s) / Detail(s))

Description: _____

Attachments: _____

	Engineer:

Receipt Acknowledged by Contractor:	Date:

Copy to Owner

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Work Change Directive (Form C-00 63 49)

No. _____

Date of Issuance: _____ Effective Date: _____

Project:	Owner:	Owner's Contract No.:
Contract:		Date of Contract:
Contractor:		Engineer's Project No.:

Contractor is directed to proceed promptly with the following change(s):

Item No.	Description

Attachments (list documents supporting change):

_____

_____

Purpose for Work Change Directive:

Authorization for Work described herein to proceed on the basis of Cost of the Work due to:

☐ Nonagreement on pricing of proposed change.

☐ Necessity to expedite Work described herein prior to agreeing to changes on Contract Price and Contract Time.

Estimated change in Contract Price and Contract Times:

Contract Price $_____ (increase/decrease) Contract Time _____ (increase/decrease) days

Recommended for Approval by Engineer:	Date
Authorized for Owner by:	Date
Received for Contractor by:	Date
Received by Funding Agency (if applicable):	Date:

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CHANGE REQUEST (FORM C-00 63 60)
(Design Changes/Deviations/Substitutions)

CR NO.
DATE

Project:

Request Initiated by:
- ☐ Contractor
- ☐ Owner
- ☐ Engineer

Impact to Contract Price expected ☐
Impact to Contract Time expected ☐
Change Orders will be processed separately

Request submitted as (format):

Description of Change (☐ documentation attached)

Reason for Change

Response: ☐ This constitutes a Written Amendment to the Agreement.

Review of the proposed change/deviation/substitution by Engineer is for general compatibility with the design concept of the Project. This review does not extend to means, methods, sequences, or procedures of construction or to issues of safety incident thereto. This review shall not relieve the Contractor from responsibility for full compliance with the requirements specified in the Contract Documents and to determine and verify the information contained therein.

Recommended By Engineer for Acceptance (subject to above comments if any) ☐ recommended for processing and approval under a separate Change Order NAME: *Signature* *Date*	☐ Approved by Owner (no schedule or cost impact) ☐ Acknowledged by Owner – to be processed and approved under a separate Change Order NAME: *Signature* *Date*
Approved by Contractor ☐ Change Order to be requested NAME: *Signature* *Date*	

This page intentionally left blank

Change Order No. _____

(Form C-00 63 63) MA

Date of Issuance: _____ Effective Date: _____

Project:	Owner:	Owner's Contract No.:
Contract:		Date of Contract:
Contractor:		Engineer's Project No.:

The Contract Documents are modified as follows upon execution of this Change Order:

Description:

Attachments (list documents supporting change):

CHANGE IN CONTRACT PRICE:	**CHANGE IN CONTRACT TIMES:**
Original Contract Price: $_____	Original Contract Times: ☐ Working days ☐ Calendar days Substantial completion (days or date): _____ Ready for final payment (days or date): _____
[Increase] [Decrease] from previously approved Change Orders No. _____ to No. _____: $_____	[Increase] [Decrease] from previously approved Change Orders No. _____ to No. _____: Substantial completion (days): _____ Ready for final payment (days): _____
Contract Price prior to this Change Order: $_____	Contract Times prior to this Change Order: Substantial completion (days or date): _____ Ready for final payment (days or date): _____
[Increase] [Decrease] of this Change Order: $_____	[Increase] [Decrease] of this Change Order: Substantial completion (days or date): _____ Ready for final payment (days or date): _____
Contract Price incorporating this Change Order: $_____	Contract Times with all approved Change Orders: Substantial completion (days or date): _____ Ready for final payment (days or date): _____

RECOMMENDED:	ACCEPTED:	ACCEPTED:
By: _____	By: _____	By: _____
Engineer (Authorized Signature)	Owner (Authorized Signature)	Contractor (Authorized Signature)
Date: _____	Date: _____	Date: _____
Approved by Funding Agency (if applicable):	Approved by Funding Agency (if applicable):	Approved by Funding Agency (if applicable):
_____	_____	_____
Date: _____	Date: _____	Date: _____

Pursuant to MGL c.44, s31C, I certify that appropriated funds are available for the total amount of this Change Order.

_____ Date: _____

Owner's Auditor/Accountant (Name)

Pursuant to MGL c.30, s39I, reasons for deviation are as stated above or attached. The specified deviation(s) does not materially injure the Project as a whole, the Work is of the same cost and quality or an equitable adjustment has been agreed upon, and the deviation is in the best interest of the Owner.

_____ Date: _____

Owner

A. GENERAL INFORMATION

This document was developed to provide a uniform format for handling contract changes that affect Contract Price or Contract Times. Changes that have been initiated by a Work Change Directive must be incorporated into a subsequent Change Order if they affect Price or Times.

Changes that affect Contract Price or Contract Times should be promptly covered by a Change Order. The practice of accumulating Change Orders to reduce the administrative burden may lead to unnecessary disputes.

If Milestones have been listed in the Agreement, any effect of a Change Order thereon should be addressed.

For supplemental instructions and minor changes not involving a change in the Contract Price or Contract Times, a Field Order should be used.

B. COMPLETING THE CHANGE ORDER FORM

Engineer normally initiates the form, including a description of the changes involved and attachments based upon documents and proposals submitted by Contractor, or requests from Owner, or both.

Once Engineer has completed and signed the form, all copies should be sent to Owner or Contractor for approval, depending on whether the Change Order is a true order to the Contractor or the formalization of a negotiated agreement for a previously performed change. After approval by one contracting party, all copies should be sent to the other party for approval. Engineer should make distribution of executed copies after approval by both parties.

If a change only applies to price or to times, cross out the part of the tabulation that does not apply.

This page intentionally left blank

Notice of Substantial Completion (C-00 65 15)

Project:	Owner:	Owner's Contract No.:
Contract:		Date of Contract:
Contractor:		

This NOTICE of Substantial Completion applies to:

☐ The following Systems, Equipment or specified portions ☐ : All Work under the Contract Documents

:

Date of Substantial Completion for above

The following documents are attached to and made part of this Notice.

Submitted by Contractor

Date

This page intentionally left blank

Certificate of Substantial Completion (Form C-00 65 16)

Project:	
Owner:	Owner's Contract No.:
Contract:	Engineer's Project No.:

This [tentative] [definitive] Certificate of Substantial Completion applies to:

☐ All Work under the Contract Documents: ☐ The following specified portions of the Work:

Date of Substantial Completion

The Work to which this Certificate applies has been inspected by authorized representatives of Owner, Contractor, and Engineer, and found to be substantially complete. The Date of Substantial Completion of the Project or portion thereof designated above is hereby declared and is also the date of commencement of applicable warranties required by the Contract Documents, except as stated below.

A [tentative] [definitive] list of items to be completed or corrected is attached hereto. This list may not be all-inclusive, and the failure to include any items on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents.

The responsibilities between Owner and Contractor for security, operation, safety, maintenance, heat, utilities, insurance and warranties shall be as provided in the Contract Documents except as amended as follows:

☐ Amended Responsibilities ☐ Not Amended

Owner's Amended Responsibilities:

Contractor's Amended Responsibilities:

The following documents are attached to and made part of this Certificate:

This Certificate does not constitute an acceptance of Work not in accordance with the Contract Documents nor is it a release of Contractor's obligation to complete the Work in accordance with the Contract Documents.

Executed by Engineer	Date
Accepted by Contractor	Date
Accepted by Owner	Date

Notice of Completion (Form C-00 65 18)

Project:	Owner:	Owner's Contract No.:
Contract:		Date of Contract:
Contractor:		

This NOTICE of Completion applies to:

☐ All Work under the Contract Documents: ☐ The following specified portions:

Date of final Completion

The Work to which this Notice applies is ready for inspection by authorized representatives of Engineer and Owner. Contractor has completed all corrections, delivered all required documentation, and the Project, or portion designated above, is complete. The Date of Completion of the Project or portion thereof designated above is hereby declared by the Contractor.
.

The following documents are attached to and made part of this Certificate:

Final Punchlist

Final Application for Payment

Only the **making and acceptance of final payment** will constitute:

1. A waiver of all claims by Owner against Contractor, except claims arising from any unsettled liens, from Defective Construction appearing after final inspection; from failure to comply with the Contract Documents or the terms of any special guarantees specified therein, or from Contractor's continuing obligations under the Contract Documents; and
2. A waiver of all claims by Contractor against Owner other than those previously timely made in writing and still unsettled.

Submitted by Contractor Date

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See various sections of the Supplementary Conditions for additional modifications and supplements

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

SECTION 00 72 05
STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

Prepared by

ENGINEERS JOINT CONTRACT DOCUMENTS COMMITTEE

and

Issued and Published Jointly by

ACEC
American Council of Engineering Companies

The Associated General Contractors of America — Skill Responsibility Integrity

ASCE American Society of Civil Engineers

National Society of Professional Engineers
Professional Engineers in Private Practice

AMERICAN COUNCIL OF ENGINEERING COMPANIES

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A Practice Division of the
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CONSTRUCTION SPECIFICATIONS INSTITUTE

REVISIONS HIGHLIGHTED WITHIN THE TEXT OF THIS SECTION HAVE BEEN PREPARED BY WOODARD & CURRAN ON BEHALF OF OWNER AND APPROVED BY OWNER'S LEGAL COUNSEL KOPELMAN & PAIGE, P.C.

EJCDC C-700 Standard General Conditions of the Construction Contract
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See various sections of the Supplementary Conditions for additional modifications and supplements

These General Conditions have been prepared for use with the Suggested Forms of Agreement Between Owner and Contractor (EJCDC C-520 or C-525, 2007 Editions). Their provisions are interrelated and a change in one may necessitate a change in the other. Comments concerning their usage are contained in the Narrative Guide to the EJCDC Construction Documents (EJCDC C-001, 2007 Edition). For guidance in the preparation of Supplementary Conditions, see Guide to the Preparation of Supplementary Conditions (EJCDC C-800, 2007 Edition).

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SECTION 00 72 05
STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

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ARTICLE 1 – DEFINITIONS AND TERMINOLOGY

1.01 *Defined Terms*

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

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

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

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

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

5. *Bid*—The offer or proposal of a Bidder submitted on the prescribed form setting forth the prices for the Work to be performed. May also be referred to as "Proposal" which may be used interchangeably and shall have the same meaning.

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

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

8. *Bidding Requirements*—The advertisement or invitation to bid, Instructions to Bidders, Bid security of acceptable form, if any, and the Bid Form with any supplements.

9. *Change Order*—A document recommended by Engineer which is signed by Contractor and Owner and authorizes an addition, deletion, or revision in the Work or an adjustment in the Contract Price or the Contract Times, issued on or after the Effective Date of the Agreement.

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

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

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

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

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

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

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

17. *Drawings*—That part of the Contract Documents prepared or approved by Engineer which graphically shows the scope, extent, and character of the Work to be performed by Contractor and complement the Specifications. Shop Drawings and other Contractor submittals are not Drawings as so defined. May also be referred to as "Plans", which may be used interchangeably and shall have the same meaning. Notes on Drawings are directed to Contractor unless specifically noted otherwise.

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

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

20. *Field Order*—A written order issued by Engineer which requires minor changes in the Work but which does not involve a change in the Contract Price or the Contract Times.

21. *General Requirements*—Sections of Division 01 of the Specifications which govern the Work in all sections of the Specifications.

22. *Hazardous Environmental Condition*—The presence at the Site of Asbestos, PCBs, Petroleum, Hazardous Waste, or Radioactive Material in such quantities or circumstances that may present a substantial danger to persons or property exposed thereto.

23. *Hazardous Waste*—The term Hazardous Waste shall have the meaning provided in Section 1004 of the Solid Waste Disposal Act (42 USC Section 6903) as amended from time to time.

24. *Laws and Regulations; Laws or Regulations*—Any and all applicable laws, rules, regulations, ordinances, codes, and orders of any and all governmental bodies, agencies, authorities, and courts having jurisdiction.

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25.

26. *Liens*—Charges, security interests, or encumbrances upon Project funds, real property, or personal property.

27. *Milestone*—A principal event specified in the Contract Documents relating to an intermediate completion date or time prior to Substantial Completion of all the Work.

28. *Notice of Award*—The written notice by Owner to the Successful Bidder stating that upon timely compliance by the Successful Bidder with the conditions precedent listed therein, Owner will sign and deliver the Agreement.

29. *Notice to Proceed*—A written notice given by Owner to Contractor fixing the date on which the Contract Times will commence to run and on which Contractor shall start to perform the Work under the Contract Documents.

30. *Owner*—The individual or entity with whom Contractor has entered into the Agreement and for whom the Work is to be performed.

31. *PCBs*—Polychlorinated biphenyls.

32. *Petroleum*—Petroleum, including crude oil or any fraction thereof which is liquid at standard conditions of temperature and pressure (60 degrees Fahrenheit and 14.7 pounds per square inch absolute), such as oil, petroleum, fuel oil, oil sludge, oil refuse, gasoline, kerosene, and oil mixed with other non-Hazardous Waste and crude oils.

33. *Progress Schedule*—A schedule, prepared and maintained by Contractor, describing the sequence and duration of the activities comprising the Contractor's plan to accomplish the Work within the Contract Times. May also be referred to as "Construction Schedule", which may be used interchangeably and shall have the same meaning.

34. *Project*—The total construction of which the Work to be performed under the Contract Documents may be the whole, or a part.

35. *Project Manual*—The bound documentary information prepared for bidding and constructing the Work. A listing of the contents of the Project Manual, which may be bound in one or more volumes, is contained in the table(s) of contents.

36. *Radioactive Material*—Source, special nuclear, or byproduct material as defined by the Atomic Energy Act of 1954 (42 USC Section 2011 et seq.) as amended from time to time.

37. *Resident Project Representative*—The authorized representative of Engineer who may be assigned to the Site or any part thereof.

38. *Samples*—Physical examples of materials, equipment, or workmanship that are representative of some portion of the Work and which establish the standards by which such portion of the Work will be judged.

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39. *Schedule of Submittals*—A schedule, prepared and maintained by Contractor, of required submittals and the time requirements to support scheduled performance of related construction activities.

40. *Schedule of Values*—A schedule, prepared and maintained by Contractor, allocating portions of the Contract Price to various portions of the Work and used as the basis for reviewing Contractor's Applications for Payment.

41. *Shop Drawings*—All drawings, diagrams, illustrations, schedules, and other data or information which are specifically prepared or assembled by or for Contractor and submitted by Contractor to illustrate some portion of the Work.

42. *Site*—Lands or areas indicated in the Contract Documents as being furnished by Owner upon which the Work is to be performed, including rights-of-way and easements for access thereto, and such other lands furnished by Owner which are designated for the use of Contractor.

43. *Specifications*—That part of the Contract Documents consisting of written requirements for materials, equipment, systems, standards and workmanship as applied to the Work, and certain administrative requirements and procedural matters applicable thereto. The Specifications are based on the guidelines of the Construction Specifications Institute (CSI) Project Resource Manual, and are directed to Contractor unless specifically noted otherwise. The words "shall be" are included by inference where a colon (:) is used within sentences or phrases in the Specifications.

44. *Subcontractor*—An individual or entity having a direct contract with Contractor or with any other Subcontractor for the performance of a part of the Work at the Site.

45. *Substantial Completion*—The time at which the Work (or a specified part thereof) has progressed to the point where, in the opinion of Engineer, the Work (or a specified part thereof) is sufficiently complete, in accordance with the Contract Documents, so that the Work (or a specified part thereof) can be utilized for the purposes for which it is intended. The terms "substantially complete" and "substantially completed" as applied to all or part of the Work refer to Substantial Completion thereof.

46. *Successful Bidder*—The Bidder submitting a responsive Bid to whom Owner makes an award.

47. *Supplementary Conditions*—That part of the Contract Documents which amends or supplements these General Conditions.

48. *Supplier*—A manufacturer, fabricator, supplier, distributor, materialman, or vendor having a direct contract with Contractor or with any Subcontractor to furnish materials or equipment to be incorporated in the Work by Contractor or Subcontractor.

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49. *Underground Facilities*—All underground pipelines, conduits, ducts, cables, wires, manholes, vaults, tanks, tunnels, or other such facilities or attachments, and any encasements containing such facilities, including those that convey electricity, gases, steam, liquid petroleum products, telephone or other communications, cable television, water, wastewater, storm water, other liquids or chemicals, or traffic or other control systems.

50. *Unit Price Work*—Work to be paid for on the basis of unit prices.

51. *Work*—The entire construction or the various separately identifiable parts thereof required to be provided under the Contract Documents. Work includes and is the result of performing or providing all labor, services, and documentation necessary to produce such construction, and furnishing, installing, and incorporating all materials and equipment into such construction, all as required by the Contract Documents.

52. *Work Change Directive*—A written statement to Contractor issued on or after the Effective Date of the Agreement and signed by Owner and recommended by Engineer ordering an addition, deletion, or revision in the Work, or responding to differing or unforeseen subsurface or physical conditions under which the Work is to be performed or to emergencies. A Work Change Directive will not change the Contract Price or the Contract Times but is evidence that the parties expect that the change ordered or documented by a Work Change Directive will be incorporated in a subsequently issued Change Order following negotiations by the parties as to its effect, if any, on the Contract Price or Contract Times.

B. Additional Terms

1. *Final Completion*—The time at which all Work is completed and ready for final payment in accordance with Paragraph 14.07 of these General Conditions.

2. *Industry Practice*—The written practices, methods, materials, supplies and equipment, as changed from time to time, that are commonly used in the industry applicable to the Project to design, construct and operate facilities and plants, or any practices, methods and acts, which in the exercise of reasonable judgment in light of the facts known at the time, could have been expected to accomplish the desired results consistent with good business practices, reliability, safety and expedition.

3. *Punch List*—A list of open items representing portions of the Work which Contractor, Engineer, Owner reasonably agree is not complete on the date of Substantial Completion or Final Completion, but which items will not significantly interfere with the safe, reliable operation and integrity of the Project or its intended use.

4. *Purchase Order*—A written agreement between Contractor and a Supplier for provision of material and equipment.

~~53.~~5. *Warranty Period*—The correction period after the date of Substantial Completion per Paragraph 13.07 of these General Conditions.

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1.02 *Terminology*

A. The words and terms discussed in Paragraph 1.02.B through F are not defined but, when used in the Bidding Requirements or Contract Documents, have the indicated meaning.

B. Intent of Certain Terms or Adjectives:

1. The Contract Documents include the terms "as allowed," "as approved," "as ordered," "as directed" or terms of like effect or import to authorize an exercise of professional judgment by Engineer. In addition, the adjectives "reasonable," "suitable," "acceptable," "proper," "satisfactory," or adjectives of like effect or import are used to describe an action or determination of Engineer as to the Work. It is intended that such exercise of professional judgment, action, or determination will be solely to evaluate, in general, the Work for compliance with the information in the Contract Documents and with the design concept of the Project as a functioning whole as shown or indicated in the Contract Documents (unless there is a specific statement indicating otherwise). The use of any such term or adjective is not intended to and shall not be effective to assign to Engineer any duty or authority to supervise or direct the performance of the Work, or any duty or authority to undertake responsibility contrary to the provisions of Paragraph 9.09 or any other provision of the Contract Documents.

C. Day:

1. The word "day" means a calendar day of 24 hours measured from midnight to the next midnight. See also Paragraph 17.02 of these General Conditions.

D. Defective:

1. The word "defective," when modifying the word "Work," refers to Work that is unsatisfactory, faulty, or deficient in that it:

a. does not conform to the Contract Documents; or

b. does not meet the requirements of any applicable inspection, reference standard, test, or approval referred to in the Contract Documents; or

c. has been damaged prior to Engineer's recommendation of final payment (unless responsibility for the protection thereof has been assumed by Owner at Substantial Completion in accordance with Paragraph 14.04 or 14.05).

E. Furnish, Install, Perform, Provide:

1. The word "furnish," when used in connection with services, materials, or equipment, shall mean to supply and deliver said services, materials, or equipment to the Site (or some other specified location) ready for use or installation and in usable or operable condition.

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2. The word "install," when used in connection with services, materials, or equipment, shall mean to put into use or place in final position said services, materials, or equipment complete and ready for intended use.

3. The words "perform" or "provide," when used in connection with services, materials, or equipment, shall mean to furnish and install said services, materials, or equipment complete and ready for intended use.

4. When "furnish," "install," "perform," or "provide" is not used in connection with services, materials, or equipment in a context clearly requiring an obligation of Contractor, "provide" is implied.

F. Unless stated otherwise in the Contract Documents, words or phrases that have a well-known technical or construction industry or trade meaning are used in the Contract Documents in accordance with such recognized meaning.

ARTICLE 2 – PRELIMINARY MATTERS

2.01 *Delivery of Bonds and Evidence of Insurance*

A. ~~When Contractor delivers the executed counterparts~~Prior to execution of the Agreement ~~to Owner~~, Contractor shall ~~also~~ deliver to Owner such bonds as Contractor may be required to furnish.

B. *Evidence of Insurance:* Prior to execution of the Agreement and b~~B~~efore any Work at the Site is started, Contractor and Owner shall each deliver to the other, with copies to each additional insured identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance which either of them or any additional insured may reasonably request) which Contractor and Owner respectively are required to purchase and maintain in accordance with Article 5.

2.02 *Copies of Documents*

A. Owner shall furnish to Contractor up to ~~ten~~ 2 printed or hard copies of the Contract Documents and Drawings ~~and Project Manual~~. Additional copies will be furnished upon request at the cost of reproduction.

2.03 *Commencement of Contract Times; Notice to Proceed*

A. The Contract Times will commence to run on the thirtieth day after the Effective Date of the Agreement or, if a Notice to Proceed is given, on the day indicated in the Notice to Proceed. A Notice to Proceed may be given at any time within 30 days after the Effective Date of the Agreement. In no event will the Contract Times commence to run later than the ~~sixtieth~~ 90th day after the day of Bid opening or the thirtieth day after the Effective Date of the Agreement, unless mutually agreed otherwise.~~, whichever date is earlier.~~

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2.04 *Starting the Work*

A. Contractor shall start to perform the Work on the date when the Contract Times commence to run. No Work shall be done at the Site prior to the date on which the Contract Times commence to run.

2.05 *Before Starting Construction*

A. *Preliminary Schedules:* Within 10 days after the Effective Date of the Agreement (unless otherwise specified in the General Requirements), Contractor shall submit to Engineer for timely review:

1. a preliminary Progress Schedule indicating the times (numbers of days or dates) for starting and completing the various stages of the Work, including any Milestones specified in the Contract Documents and the lead times for equipment and materials per the listing in subparagraph 2.05.A.4;

2. a preliminary Schedule of Submittals; and

3. a preliminary Schedule of Values for all of the Work which includes quantities and prices of items which when added together equal the Contract Price and subdivides the Work into component parts in sufficient detail to serve as the basis for progress payments during performance of the Work which will be confirmed in writing by Contractor at the time of submission. Such prices will include an appropriate amount of overhead and profit applicable to each item of Work; and

4. a complete listing of equipment and materials with lead times between placing orders and delivery, including normal allowances of time for processing and correcting Shop Drawings. All orders for long lead items shall be placed within 30 days after Effective Date of the Agreement if delivery is critical to scheduling. Failure to place orders promptly may result in full liability for liquidated damages if Contract Times are not met.

B. *Evidence of Insurance*: In accordance with Paragraph 2.01.

2.06 *Preconstruction Conference; Designation of Authorized Representatives*

A. Before any Work at the Site is started, a conference attended by Owner, Contractor, Engineer, and others as appropriate will be held to establish a working understanding among the parties as to the Work and to discuss the schedules referred to in Paragraph 2.05.A, procedures for handling Shop Drawings and other submittals, processing Applications for Payment, and maintaining required records.

B. At this conference Owner and Contractor each shall designate, in writing, a specific individual to act as its authorized representative with respect to the services and responsibilities under the Contract. Such individuals shall have the authority to transmit instructions, receive information, render decisions relative to the Contract, and otherwise act on behalf of each respective party.

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2.07 *Initial Acceptance of Schedules*

A. At least 10 days before submission of the first Application for Payment a conference attended by Contractor, Engineer, and others as appropriate will be held to review for acceptability to Engineer as provided below the schedules submitted in accordance with Paragraph 2.05.A. Contractor shall have an additional 10 days to make corrections and adjustments and to complete and resubmit the schedules. No progress payment shall be made to Contractor until acceptable schedules are submitted to Engineer.

1. The Progress Schedule will be acceptable to Engineer if it provides an orderly progression of the Work to completion within the Contract Times. Such acceptance will not impose on Engineer responsibility for the Progress Schedule, for sequencing, scheduling, or progress of the Work, nor interfere with or relieve Contractor from Contractor's full responsibility therefor.

2. Contractor's Schedule of Submittals will be acceptable to Engineer if it provides a workable arrangement for reviewing and processing the required submittals.

3. Contractor's Schedule of Values will be acceptable to Engineer as to form and substance if it provides a reasonable allocation of the Contract Price to component parts of the Work.

ARTICLE 3 – CONTRACT DOCUMENTS: INTENT, AMENDING, REUSE

3.01 *Intent*

A. The Contract Documents are complementary; what is required by one is as binding as if required by all.

B. It is the intent of the Contract Documents to describe a functionally complete project (or part thereof) to be constructed in accordance with the Contract Documents. Any labor, documentation, services, materials, or equipment that reasonably may be inferred from the Contract Documents or from prevailing custom or trade usage as being required to produce the indicated result will be provided whether or not specifically called for, at no additional cost to Owner.

C. Clarifications and interpretations of the Contract Documents shall be issued by Engineer as provided in Article 9.

3.02 *Reference Standards*

A. Standards, Specifications, Codes, Laws, and Regulations

1. Reference to standards, specifications, manuals, or codes of any technical society, organization, or association, or to Laws or Regulations, whether such reference be specific or by implication, shall mean the standard, specification, manual, code, or Laws or Regulations in effect at the time of opening of Bids (or on the Effective Date of the Agreement if there were no Bids), except as may be otherwise specifically stated in the Contract Documents.

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2. No provision of any such standard, specification, manual, or code, or any instruction of a Supplier, shall be effective to change the duties or responsibilities of Owner, Contractor, or Engineer, or any of their subcontractors, consultants, agents, or employees, from those set forth in the Contract Documents. No such provision or instruction shall be effective to assign to Owner, Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, any duty or authority to supervise or direct the performance of the Work or any duty or authority to undertake responsibility inconsistent with the provisions of the Contract Documents.

3.03 *Reporting and Resolving Discrepancies*

A. Reporting Discrepancies:

1. *Contractor's Review of Contract Documents Before Starting Work*: Before undertaking each part of the Work, Contractor shall carefully study and compare the Contract Documents and check and verify pertinent figures therein and all applicable field measurements. Contractor shall promptly report in writing to Engineer any conflict, error, ambiguity, or discrepancy which Contractor discovers, or has actual knowledge of, and shall obtain a written interpretation or clarification from Engineer before proceeding with any Work affected thereby.

2. *Contractor's Review of Contract Documents During Performance of Work*: If, during the performance of the Work, Contractor discovers any conflict, error, ambiguity, or discrepancy within the Contract Documents, or between the Contract Documents and (a) any applicable Law or Regulation, (b) any standard, specification, manual, or code, or (c) any instruction of any Supplier, then Contractor shall promptly report it to Engineer in writing. Contractor shall not proceed with the Work affected thereby (except in an emergency as required by Paragraph 6.16.A) until an amendment or supplement to the Contract Documents has been issued by one of the methods indicated in Paragraph 3.04.

3. Contractor shall ~~not~~ be liable to Owner or Engineer for failure to report any such conflict, error, ambiguity, or discrepancy in the Contract Documents ~~unless~~ if Contractor ~~had actual knowledge~~knew or reasonably should have known thereof.

B. Resolving Discrepancies:

1. Except as may be otherwise specifically stated in the Contract Documents, the provisions of the Contract Documents shall take precedence in resolving any conflict, error, ambiguity, or discrepancy between the provisions of the Contract Documents and:

a. the provisions of any standard, specification, manual, or code, or the instruction of any Supplier (whether or not specifically incorporated by reference in the Contract Documents); or

b. the provisions of any Laws or Regulations applicable to the performance of the Work (unless such an interpretation of the provisions of the Contract Documents would result in violation of such Law or Regulation).

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3.04 *Amending and Supplementing Contract Documents*

A. The Contract Documents may be amended to provide for additions, deletions, and revisions in the Work or to modify the terms and conditions thereof by either a Change Order or a Work Change Directive.

B. The requirements of the Contract Documents may be supplemented, and minor variations and deviations in the Work may be authorized, by one or more of the following ways:

1. A Field Order;

2. Engineer's approval of a Shop Drawing or Sample (subject to the provisions of Paragraph 6.17.D.3); or

3. Engineer's written interpretation or clarification.

3.05 *Reuse of Documents*

A. Contractor and any Subcontractor or Supplier shall not:

1. have or acquire any title to or ownership rights in any of the Drawings, Specifications, or other documents (or copies of any thereof) prepared by or bearing the seal of Engineer or its consultants, including electronic media editions; or

2. reuse any such Drawings, Specifications, other documents, or copies thereof on extensions of the Project or any other project without written consent of Owner and Engineer and specific written verification or adaptation by Engineer.

B. The prohibitions of this Paragraph 3.05 will survive final payment, or termination of the Contract. Nothing herein shall preclude Contractor from retaining copies of the Contract Documents for record purposes.

3.06 *Electronic Data*

A. ~~Unless otherwise stated in the Supplementary Conditions, t~~The data furnished by Owner or Engineer to Contractor, or by Contractor to Owner or Engineer, that may be relied upon are limited to the printed copies (also known as hard copies), files transmitted in in portable document format (PDF), and other electronic media formats of text, data, graphics or other file types supported by any digital document exchange system implemented for the Project, all of which are understood by all parties to constitute official Project correspondence and submittals . ~~Files in electronic media format of text, data, graphics, or other types are furnished only for the convenience of the receiving party. Any conclusion or information obtained or derived from such electronic files will be at the user's sole risk.~~ If there is a discrepancy between the electronic files and the hard copies, the hard copies govern.

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B. Because data stored in electronic media format can deteriorate or be modified inadvertently or otherwise without authorization of the data's creator, the party receiving electronic files agrees that it will perform acceptance tests or procedures within 60 days, after which the receiving party shall be deemed to have accepted the data thus transferred. Any errors detected within the 60-day acceptance period will be corrected by the transferring party.

C. When transferring documents in electronic media format, the transferring party makes no representations as to long term compatibility, usability, or readability of documents resulting from the use of software application packages, operating systems, or computer hardware differing from those used by the data's creator.

ARTICLE 4 – AVAILABILITY OF LANDS; SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS ENVIRONMENTAL CONDITIONS; REFERENCE POINTS

4.01 *Availability of Lands*

A. Owner shall furnish the Site. Owner shall notify Contractor of any encumbrances or restrictions not of general application but specifically related to use of the Site with which Contractor must comply in performing the Work. Owner will obtain in a timely manner and pay for easements for permanent structures or permanent changes in existing facilities. If Contractor and Owner are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times, or both, as a result of any delay in Owner's furnishing the Site or a part thereof, Contractor may make a Claim therefor as provided in Paragraph 10.05.

B. Upon reasonable written request, Owner shall furnish Contractor with a current statement of record legal title and legal description of the lands upon which the Work is to be performed and Owner's interest therein as necessary for giving notice of or filing a mechanic's or construction lien against such lands in accordance with applicable Laws and Regulations.

C. Contractor shall provide for all additional lands and access thereto that may be required for temporary construction facilities or storage of materials and equipment.

4.02 *Subsurface and Physical Conditions*

A. *Reports and Drawings:* The Supplementary Conditions identify:

1. those reports known to Owner of explorations and tests of subsurface conditions at or contiguous to the Site; and

2. those drawings known to Owner of physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities).

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B. *Limited Reliance by Contractor on Technical Data Authorized:* Contractor may rely upon the accuracy of the "technical data" contained in such reports and drawings, but such reports and drawings are not Contract Documents. Such "technical data" is identified in the Supplementary Conditions. Except for such reliance on such "technical data," Contractor may not rely upon or make any claim against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors with respect to:

1. the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor, and safety precautions and programs incident thereto; or

2. other data, interpretations, opinions, and information contained in such reports or shown or indicated in such drawings; or

3. any Contractor interpretation of or conclusion drawn from any "technical data" or any such other data, interpretations, opinions, or information.

4.03 *Differing Subsurface or Physical Conditions*

A. *Notice:* If Contractor believes that any subsurface or physical condition that is uncovered or revealed either:

1. is of such a nature as to establish that any "technical data" on which Contractor is entitled to rely as provided in Paragraph 4.02 is materially inaccurate; or

2. is of such a nature as to require a change in the Contract Documents; or

3. differs materially from that shown or indicated in the Contract Documents; or

4. is of an unusual nature, and differs materially from conditions ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract Documents;

then Contractor shall, promptly after becoming aware thereof and before further disturbing the subsurface or physical conditions or performing any Work in connection therewith (except in an emergency as required by Paragraph 6.16.A), notify Owner and Engineer in writing about such condition. Contractor shall not further disturb such condition or perform any Work in connection therewith (except as aforesaid) until receipt of written order to do so.

B. *Engineer's Review*: After receipt of written notice as required by Paragraph 4.03.A, Engineer will promptly review the pertinent condition, determine the necessity of Owner's obtaining additional exploration or tests with respect thereto, and advise Owner in writing (with a copy to Contractor) of Engineer's findings and conclusions.

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C. Possible Price and Times Adjustments:

1. The Contract Price or the Contract Times, or both, ~~will~~ may be equitably adjusted to the extent that the existence of such differing subsurface or physical condition causes an increase or decrease in Contractor's cost of, or time required for, performance of the Work; subject, however, to the following:

   a. such condition must meet any one or more of the categories described in Paragraph 4.03.A; and

   b. with respect to Work that is paid for on a unit price basis, any adjustment in Contract Price will be subject to the provisions of Paragraphs 9.07 and 11.03.

2. Contractor shall not be entitled to any adjustment in the Contract Price or Contract Times if:

   a. Contractor knew of the existence of such conditions at the time Contractor made a final commitment to Owner with respect to Contract Price and Contract Times by the submission of a Bid or becoming bound under a negotiated contract; or

   b. the existence of such condition could reasonably have been discovered or revealed as a result of any examination, investigation, exploration, test, or study of the Site and contiguous areas required by the Bidding Requirements or Contract Documents to be conducted by or for Contractor prior to Contractor's making such final commitment; or

   c. Contractor failed to give the written notice as required by Paragraph 4.03.A.

3. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times, or both, a Claim may be made therefor as provided in Paragraph 10.05. However, neither Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors shall be liable to Contractor for any claims, costs, losses, or damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by Contractor on or in connection with any other project or anticipated project.

4.04 *Underground Facilities*

A. *Shown or Indicated:* The information and data shown or indicated in the Contract Documents with respect to existing Underground Facilities at or contiguous to the Site is based on information and data furnished to Owner or Engineer by the owners of such Underground Facilities, including Owner, or by others. Unless it is otherwise expressly provided in the Supplementary Conditions:

1. Owner and Engineer shall not be responsible for the accuracy or completeness of any such information or data provided by others; and

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2. the cost of all of the following will be included in the Contract Price, and Contractor shall have full responsibility for:

   a. reviewing and checking all such information and data;

   b. locating all Underground Facilities shown or indicated in the Contract Documents;

   c. coordination of the Work with the owners of such Underground Facilities, including Owner, during construction; and

   d. the safety and protection of all such Underground Facilities and repairing any damage thereto resulting from the Work.

B. Not Shown or Indicated:

1. If an Underground Facility is uncovered or revealed at or contiguous to the Site which was not shown or indicated, or not shown or indicated with reasonable accuracy in the Contract Documents, Contractor shall, promptly after becoming aware thereof and before further disturbing conditions affected thereby or performing any Work in connection therewith (except in an emergency as required by Paragraph 6.16.A), identify the owner of such Underground Facility and give written notice to that owner and to Owner and Engineer. Engineer will promptly review the Underground Facility and determine the extent, if any, to which a change is required in the Contract Documents to reflect and document the consequences of the existence or location of the Underground Facility. During such time, Contractor shall be responsible for the safety and protection of such Underground Facility.

2. If Engineer concludes that a change in the Contract Documents is required, a Work Change Directive or a Change Order will be issued to reflect and document such consequences. An equitable adjustment shall be made in the Contract Price or Contract Times, or both, to the extent that they are attributable to the existence or location of any Underground Facility that was not shown or indicated ~~or not shown or indicated with reasonable accuracy~~ in the Contract Documents and that Contractor did not know of and could not reasonably have been expected to be aware of or to have anticipated. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment in Contract Price or Contract Times, Owner or Contractor may make a Claim therefor as provided in Paragraph 10.05.

3. Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them, shall not be liable to Contractor for any Claims, losses, or damages incurred by Contractor (including but not limited to all fees and changes of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) related to Underground Facilities not shown or indicated.

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4.05 *Reference Points*

A. Owner shall provide engineering surveys to establish reference points for construction which in Engineer's judgment are necessary to enable Contractor to proceed with the Work. Contractor shall be responsible for laying out the Work, shall protect and preserve the established reference points and property monuments, and shall make no changes or relocations without the prior written approval of Owner. Contractor shall report to Engineer whenever any reference point or property monument is lost or destroyed or requires relocation because of necessary changes in grades or locations, and shall be responsible for the accurate replacement or relocation of such reference points or property monuments by professionally qualified personnel.

4.06 *Hazardous Environmental Condition at Site*

A. *Reports and Drawings:* The Supplementary Conditions identify those reports and drawings known to Owner relating to Hazardous Environmental Conditions that have been identified at the Site.

B. *Limited Reliance by Contractor on Technical Data Authorized:* Contractor may rely upon the accuracy of the "technical data" contained in such reports and drawings, but such reports and drawings are not Contract Documents. Such "technical data" is identified in the Supplementary Conditions. Except for such reliance on such "technical data," Contractor may not rely upon or make any claim against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors with respect to:

1. the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences and procedures of construction to be employed by Contractor and safety precautions and programs incident thereto; or

2. other data, interpretations, opinions and information contained in such reports or shown or indicated in such drawings; or

3. any Contractor interpretation of or conclusion drawn from any "technical data" or any such other data, interpretations, opinions or information.

C. Contractor shall not be responsible for any Hazardous Environmental Condition uncovered or revealed at the Site which was not shown or indicated in Drawings or Specifications or identified in the Contract Documents to be within the scope of the Work unless Contractor caused or contributed to such Hazardous Environmental Condition. Contractor shall be responsible for a Hazardous Environmental Condition created with any materials brought to the Site by Contractor, Subcontractors, Suppliers, or anyone else for whom Contractor is responsible.

D. If Contractor encounters a Hazardous Environmental Condition or if Contractor or anyone for whom Contractor is responsible creates a Hazardous Environmental Condition, Contractor shall immediately: (i) secure or otherwise isolate such condition; (ii) stop all Work in connection with such condition and in any area affected thereby (except in an emergency as required by Paragraph 6.16.A); and (iii) notify Owner and Engineer (and promptly thereafter confirm such notice in

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writing). Owner shall promptly consult with Engineer concerning the necessity for Owner to retain a qualified expert to evaluate such condition or take corrective action, if any. Promptly after consulting with Engineer, Owner shall take such actions as are necessary to permit Owner to timely obtain required permits and provide Contractor the written notice required by Paragraph 4.06.E.

E. Contractor shall not be required to resume Work in connection with such condition or in any affected area until after Owner has obtained any required permits related thereto and delivered written notice to Contractor: (i) specifying that such condition and any affected area is or has been rendered safe for the resumption of Work; or (ii) specifying any special conditions under which such Work may be resumed safely. If Owner and Contractor cannot agree as to entitlement to or on the amount or extent, if any, of any adjustment in Contract Price or Contract Times, or both, as a result of such Work stoppage or such special conditions under which Work is agreed to be resumed by Contractor, either party may make a Claim therefor as provided in Paragraph 10.05.

F. If after receipt of such written notice Contractor does not agree to resume such Work based on a reasonable belief it is unsafe, or does not agree to resume such Work under such special conditions, then Owner may order the portion of the Work that is in the area affected by such condition to be deleted from the Work. If Owner and Contractor cannot agree as to entitlement to or on the amount or extent, if any, of an adjustment in Contract Price or Contract Times as a result of deleting such portion of the Work, then either party may make a Claim therefor as provided in Paragraph 10.05. Owner may have such deleted portion of the Work performed by Owner's own forces or others in accordance with Article 7.

G. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, Subcontractors, and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to a Hazardous Environmental Condition, provided that such Hazardous Environmental Condition: (i) was not shown or indicated in the Drawings or Specifications or identified in the Contract Documents to be included within the scope of the Work, and (ii) was not created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 4.06.G shall obligate Owner to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.

H. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to a Hazardous Environmental Condition created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 4.06.H shall obligate Contractor to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.

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I. The provisions of Paragraphs 4.02, 4.03, and 4.04 do not apply to a Hazardous Environmental Condition uncovered or revealed at the Site.

ARTICLE 5 – BONDS AND INSURANCE

5.01 *Performance, Payment, and Other Bonds*

A. Contractor shall furnish performance and payment bonds, each in an amount at least equal to the Contract Price as security for the faithful performance and payment of all of Contractor's obligations under the Contract Documents. These bonds shall remain in effect until one year after the date when final payment becomes due or until completion of the correction period specified in Paragraph 13.07, whichever is later, except as provided otherwise by Laws or Regulations or by the Contract Documents. Contractor shall also furnish such other bonds as are required by the Contract Documents.

B. All bonds shall be in the form prescribed by the Contract Documents except as provided otherwise by Laws or Regulations, and shall be executed by such sureties as are named in the list of "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Circular 570 (amended) by the Financial Management Service, Surety Bond Branch, U.S. Department of the Treasury. All bonds signed by an agent or attorney-in-fact must be accompanied by a certified copy of that individual's authority to bind the surety. The evidence of authority shall show that it is effective on the date the agent or attorney-in-fact signed each bond.

C. If the surety on any bond furnished by Contractor is declared bankrupt or becomes insolvent or its right to do business is terminated in any state where any part of the Project is located or it ceases to meet the requirements of Paragraph 5.01.B, Contractor shall promptly notify Owner and Engineer and shall, within ~~20~~ 5 days after the event giving rise to such notification, provide another bond and surety, both of which shall comply with the requirements of Paragraphs 5.01.B and 5.02.

5.02 *Licensed Sureties and Insurers*

A. All bonds and insurance required by the Contract Documents to be purchased and maintained by Owner or Contractor shall be obtained from surety or insurance companies that are duly licensed or authorized in the jurisdiction in which the Project is located to issue bonds or insurance policies for the limits and coverages so required. Such surety and insurance companies shall also meet such additional requirements and qualifications as may be provided in the Supplementary Conditions.

5.03 *Certificates of Insurance*

A. Contractor shall deliver to Owner, with copies to each additional insured and loss payee identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance requested by Owner or any other additional insured) which Contractor is required to purchase and maintain.

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B. Owner shall deliver to Contractor, with copies to each additional insured and loss payee identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance requested by Contractor or any other additional insured) which Owner is required to purchase and maintain.

C. Failure of Owner to demand such certificates or other evidence of Contractor's full compliance with these insurance requirements or failure of Owner to identify a deficiency in compliance from the evidence provided shall not be construed as a waiver of Contractor's obligation to maintain such insurance.

D. Owner does not represent that insurance coverage and limits established in this Contract necessarily will be adequate to protect Contractor.

E. The insurance and insurance limits required herein shall not be deemed as a limitation on Contractor's liability under the indemnities granted to Owner in the Contract Documents.

5.04 *Contractor's Insurance*

A. Contractor shall purchase and maintain such insurance as is appropriate for the Work being performed, complies with the requirements of Article 5, and as will provide protection from claims set forth below which may arise out of or result from Contractor's performance of the Work and Contractor's other obligations under the Contract Documents, whether it is to be performed by Contractor, any Subcontractor or Supplier, or by anyone directly or indirectly employed by any of them to perform any of the Work, or by anyone for whose acts any of them may be liable:

1. claims under workers' compensation, disability benefits, and other similar employee benefit acts;

2. claims for damages because of bodily injury, occupational sickness or disease, or death of Contractor's employees;

3. claims for damages because of bodily injury, sickness or disease, or death of any person other than Contractor's employees;

4. claims for damages insured by reasonably available personal injury liability coverage which are sustained:

   a. by any person as a result of an offense directly or indirectly related to the employment of such person by Contractor, or

   b. by any other person for any other reason;

5. claims for damages, other than to the Work itself, because of injury to or destruction of tangible property wherever located, including loss of use resulting therefrom; ~~and~~

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6. claims for damages because of bodily injury or death of any person or property damage arising out of the ownership, maintenance or use of any motor vehicle.;

7. claims arising out of violation of Laws or Regulations; and

8. claims for damages because of negligent acts, errors and omissions arising out of performing or providing professional services.

B. The policies of insurance required by this Paragraph 5.04 shall:

1. with respect to insurance required by Paragraphs 5.04.A.3 through 5.04.A.68 inclusive, be written on an occurrence basis, include as additional insureds (subject to any customary exclusion regarding professional liability) Owner and Engineer, and any other individuals or entities identified in the Supplementary Conditions, all of whom shall be listed as additional insureds, and include coverage for the respective officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of all such additional insureds, and the insurance afforded to these additional insureds shall provide primary coverage for all claims covered thereby;

2. include at least the specific coverages and be written for not less than the limits of liability provided herein and in the Supplementary Conditions or required by Laws or Regulations, whichever is greater;

3. include contractual liability insurance covering Contractor's indemnity obligations under Paragraphs 6.11 and 6.20;

4. contain a provision or endorsement that the coverage afforded will not be canceled, materially changed or renewal refused until ~~at least 30 days~~ prior written notice has been given to Owner and Contractor and to each other additional insured identified in the Supplementary Conditions to whom a certificate of insurance has been issued (and the certificates of insurance furnished by the Contractor pursuant to Paragraph 5.03 will so provide);

5. remain in effect at least until final payment and at all times thereafter when Contractor may be correcting, removing, or replacing defective Work in accordance with Paragraph 13.07; and

6. include completed operations coverage:

   a. Such insurance shall remain in effect for two years after final payment.

   b. Contractor shall furnish Owner and each other additional insured identified in the Supplementary Conditions, to whom a certificate of insurance has been issued, evidence satisfactory to Owner and any such additional insured of continuation of such insurance at final payment and one year thereafter.

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C. The limits of liability for the insurance required by Paragraph 5.04 of the General Conditions shall provide coverage for not less than the following amounts or greater where required by Laws and Regulations:

1. Workers' Compensation and related coverage:

Minimum limit of liability	Statutory
Applicable Federal (e.g., Longshoreman's)	Statutory
Employer's Liability	$1,000,000

2. Contractor's General Liability:

$1,000,000 per occurrence; $2,000,000 general aggregate; $2,000,000 per project aggregate, including:

- Broad Form Property Damage Liability including coverage for acts of terrorism
- Completed Operations and Product Liability
- Contractual Liability
- Independent Contractors
- Explosion, Collapse & Underground Hazards
- Personal Injury Coverage, Exclusion "C" Deleted
- Fire Legal Liability
- Medical payments

Pollution Liability (covering third-party injury and property damage claims, including clean-up costs, as a result of pollution conditions arising from the Contractor's operations and completed operations maintained for no less than three years after final completion): $1,000,000

Excess or Umbrella Liability: $5,000,000 per occurrence; $5,000,000 general aggregate

3. Automobile Liability under Paragraph 5.04.A.6 of the General Conditions:

Combined Single Limit of $1,000,000 for bodily injury & property damage covering Contractor and any vehicles owned, hired and non-owned by the Contractor

4. Professional Liability (E&O for engineers, architects or surveyors): $1,000,000 for each claim with an annual aggregate of at least $2,000,000 if professional services are required under the Specifications

5. Owners Protective Liability: as may be specified in the Supplementary Conditions

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Any self-insured retention (not allowed for Worker's Compensation) and/or deductibles must be identified and cannot exceed $100,000 per occurrence without the prior approval of the Owner. Contractor must provide either an audited financial statement to confirm solvency or a letter of credit guaranteeing the $100,000 in case of loss for the duration of the Project and for the Correction Period.

5.05 *Owner's Liability Insurance*

A. In addition to the insurance required to be provided by Contractor under Paragraph 5.04, Owner, at Owner's option, may purchase and maintain at Owner's expense Owner's own liability insurance as will protect Owner against claims which may arise from operations (ongoing and completed) under the Contract Documents.

5.06 *Property Insurance*

A. ~~Unless otherwise provided in the Supplementary Conditions,~~ Owner may, in its discretion, purchase and maintain property insurance upon the Work at the Site. Contractor shall purchase and maintain property insurance upon the Work at the Site in the amount of the full replacement cost thereof. Contractor shall be responsible for any ~~(subject to such~~ deductible amounts or self-insured retention as may be provided in the Supplementary Conditions or required by Laws and Regulations~~)~~. This insurance shall:

1. include the interests of Owner, Contractor, Subcontractors, and Engineer, and any other individuals or entities identified in the Supplementary Conditions, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, each of whom is deemed to have an insurable interest and shall be listed as a loss payee;

2. be written on a ~~Builder's Risk "all-risk"~~Special Forms policy form that shall at least include insurance for physical loss or damage to the Work, temporary buildings, falsework, and materials and equipment in transit, and shall insure against ~~at least~~ the ~~following~~ special form perils or causes of loss, including but not limited to: fire, lightning, flood, extended coverage, theft, vandalism and malicious mischief, earthquake, collapse, debris removal, demolition occasioned by enforcement of Laws and Regulations, water damage (other than that caused by flood), and such other perils or causes of loss as may be specifically required by the Supplementary Conditions.

3. include expenses incurred in the repair or replacement of any insured property (including but not limited to fees and charges of engineers and architects);

4. cover materials and equipment stored at the Site or at another location that was agreed to in writing by Owner prior to being incorporated in the Work, provided that such materials and equipment have been included in an Application for Payment recommended by Engineer;

5. allow for partial utilization of the Work by Owner;

6. include testing and startup; and

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7. be maintained in effect until final payment is made unless otherwise agreed to in writing by Owner, Contractor, and Engineer with 30 days written notice to each other loss payee to whom a certificate of insurance has been issued; and

8. comply with the requirements of Paragraph 5.06.C of the General Conditions.

B. (Not used)~~Owner shall purchase and maintain such equipment breakdown insurance or additional property insurance as may be required by the Supplementary Conditions or Laws and Regulations which will include the interests of Owner, Contractor, Subcontractors, and Engineer, and any other individuals or entities identified in the Supplementary Conditions, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them, each of whom is deemed to have an insurable interest and shall be listed as a loss payee.~~

C. All the policies of insurance (and the certificates or other evidence thereof) required to be purchased and maintained in accordance with this Paragraph 5.06 will contain a provision or endorsement that the coverage afforded will not be canceled or materially changed or renewal refused until ~~at least 30 days~~ prior written notice has been given to Owner and Contractor and to each other loss payee to whom a certificate of insurance has been issued and will contain waiver provisions in accordance with Paragraph 5.07.

D. Owner shall not be responsible for purchasing and maintaining any property insurance specified in this Paragraph 5.06 to protect the interests of Contractor, Subcontractors, or others in the Work to the extent of any deductible amounts that are identified in the Supplementary Conditions. The risk of loss within such identified deductible amount will be borne by Contractor, Subcontractors, or others suffering any such loss, and if any of them wishes property insurance coverage within the limits of such amounts, each may purchase and maintain it at the purchaser's own expense.

E. If Contractor requests in writing that other special insurance be included in the property insurance policies provided under this Paragraph 5.06, Owner shall, if possible, include such insurance, and the cost thereof will be charged to Contractor by appropriate Change Order. Prior to commencement of the Work at the Site, Owner shall in writing advise Contractor whether or not such other insurance has been procured by Owner.

5.07 *Waiver of Rights*

A. Owner and Contractor intend that all policies purchased in accordance with Paragraph 5.06 will protect Owner, Contractor, Subcontractors, and Engineer, and all other individuals or entities identified in the Supplementary Conditions as loss payees (and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them) in such policies and will provide primary coverage for all losses and damages caused by the perils or causes of loss covered thereby. All such policies shall contain provisions to the effect that in the event of payment of any loss or damage the insurers will have no rights of recovery against any of the insureds or loss payees thereunder. Owner and Contractor waive all rights against each other and their respective officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them for all losses and damages caused by, arising out of or resulting from any of the perils or causes of loss covered by such policies and any other property insurance applicable to the Work; and, in addition, waive all such rights against

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Subcontractors and Engineer, and all other individuals or entities identified in the Supplementary Conditions as loss payees (and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them) under such policies for losses and damages so caused. None of the above waivers shall extend to the rights that any party making such waiver may have to the proceeds of insurance held by Owner as trustee or otherwise payable under any policy so issued.

B. Owner waives all rights against Contractor, Subcontractors, and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them for:

1. loss due to business interruption, loss of use, or other consequential loss extending beyond direct physical loss or damage to Owner's property or the Work caused by, arising out of, or resulting from fire or other perils whether or not insured by Owner; and

2. loss or damage to the completed Project or part thereof caused by, arising out of, or resulting from fire or other insured peril or cause of loss covered by any property insurance maintained on the completed Project or part thereof by Owner during partial utilization pursuant to Paragraph 14.05, after Substantial Completion pursuant to Paragraph 14.04, or after final payment pursuant to Paragraph 14.07.

C. Any insurance policy maintained by Owner covering any loss, damage or consequential loss referred to in Paragraph 5.07.B shall contain provisions to the effect that in the event of payment of any such loss, damage, or consequential loss, the insurers will have no rights of recovery against Contractor, Subcontractors, or Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them.

5.08 *Receipt and Application of Insurance Proceeds(Not used)*

A. Not used~~Any insured loss under the policies of insurance required by Paragraph 5.06 will be adjusted with Owner and made payable to Owner as fiduciary for the loss payees, as their interests may appear, subject to the requirements of any applicable mortgage clause and of Paragraph 5.08.B. Owner shall deposit in a separate account any money so received and shall distribute it in accordance with such agreement as the parties in interest may reach. If no other special agreement is reached, the damaged Work shall be repaired or replaced, the moneys so received applied on account thereof, and the Work and the cost thereof covered by an appropriate Change Order~~.

~~B. Owner as fiduciary shall have power to adjust and settle any loss with the insurers unless one of the parties in interest shall object in writing within 15 days after the occurrence of loss to Owner's exercise of this power. If such objection be made, Owner as fiduciary shall make settlement with the insurers in accordance with such agreement as the parties in interest may reach. If no such agreement among the parties in interest is reached, Owner as fiduciary shall adjust and settle the loss with the insurers and, if required in writing by any party in interest, Owner as fiduciary shall give bond for the proper performance of such duties.~~

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5.09 *Acceptance of Bonds and Insurance; Option to Replace*

A. If either Owner or Contractor has any objection to the coverage afforded by or other provisions of the bonds or insurance required to be purchased and maintained by the other party in accordance with Article 5 on the basis of non-conformance with the Contract Documents, the objecting party shall so notify the other party in writing within 10 days after receipt of the certificates (or other evidence requested) required by Paragraph 2.01.B. Owner and Contractor shall each provide to the other such additional information in respect of insurance provided as the other may reasonably request. If either party does not purchase or maintain all of the bonds and insurance required of such party by the Contract Documents, such party shall notify the other party in writing of such failure to purchase prior to the start of the Work, or of such failure to maintain prior to any change in the required coverage. Without prejudice to any other right or remedy, the other party may elect to obtain equivalent bonds or insurance to protect such other party's interests at the expense of the party who was required to provide such coverage, and a Change Order shall be issued to adjust the Contract Price accordingly.

5.10 *Partial Utilization, Acknowledgment of Property Insurer*

A. If Owner finds it necessary to occupy or use a portion or portions of the Work prior to Substantial Completion of all the Work as provided in Paragraph 14.05, no such use or occupancy shall commence before the insurers providing the property insurance pursuant to Paragraph 5.06 have acknowledged notice thereof and in writing effected any changes in coverage necessitated thereby. The insurers providing the property insurance shall consent by endorsement on the policy or policies, but the property insurance shall not be canceled or permitted to lapse on account of any such partial use or occupancy.

ARTICLE 6 – CONTRACTOR'S RESPONSIBILITIES

6.01 *Supervision and Superintendence*

A. Contractor shall supervise, inspect, and direct the Work competently and efficiently, devoting such attention thereto and applying such skills and expertise as may be necessary to perform the Work in accordance with the Contract Documents. Contractor shall be solely responsible for the means, methods, techniques, sequences, and procedures of construction. Contractor shall not be responsible for the negligence of Owner or Engineer in the design or specification of a specific means, method, technique, sequence, or procedure of construction which is shown or indicated in and expressly required by the Contract Documents.

B. At all times during the progress of the Work, Contractor shall assign a competent resident superintendent who shall not be replaced without written notice to Owner and Engineer except under extraordinary circumstances.

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6.02 *Labor; Working Hours*

A. Contractor shall provide competent, suitably qualified personnel to survey and lay out the Work and perform construction as required by the Contract Documents. Contractor shall at all times maintain good discipline and order at the Site.

B. Except as otherwise required for the safety or protection of persons or the Work or property at the Site or adjacent thereto, and except as otherwise stated in the Contract Documents, all Work at the Site shall be performed during regular working hours. Contractor will not permit the performance of Work on a Saturday, Sunday, or any legal holiday without Owner's written consent (which will not be unreasonably withheld) given after prior written notice to Engineer.

6.03 *Services, Materials, and Equipment*

A. Unless otherwise specified in the Contract Documents, Contractor shall provide and assume full responsibility for all services, materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water, sanitary facilities, temporary facilities, and all other facilities and incidentals necessary for the performance, testing, start-up, and completion of the Work.

B. All materials and equipment incorporated into the Work shall be as specified or, if not specified, shall be of good quality and new, except as otherwise provided in the Contract Documents. All special warranties and guarantees required by the Specifications shall expressly run to the benefit of Owner. If required by Engineer, Contractor shall furnish satisfactory evidence (including reports of required tests) as to the source, kind, and quality of materials and equipment.

C. All materials and equipment shall be stored, applied, installed, connected, erected, protected, used, cleaned, and conditioned in accordance with instructions of the applicable Supplier, except as otherwise may be provided in the Contract Documents.

D. Provision of any instructions:

1. will not be effective to assign to Owner, or any of Owner's consultants, agents or employees, any duty or authority to supervise or direct the furnishing or performance of the Work or any duty or authority to undertake responsibility contrary to the provisions of Paragraph 8.09; and

2. will not be effective to assign to Engineer, or any of Engineer's consultants, agents or employees, any duty or authority to supervise or direct the furnishing or performance of the Work or any duty or authority to undertake responsibility contrary to the provisions of Paragraph 9.09.

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6.04 *Progress Schedule*

A. Contractor shall adhere to the Progress Schedule established in accordance with Paragraph 2.07 as it may be adjusted from time to time as provided below.

1. Contractor shall submit to Engineer for acceptance (to the extent indicated in Paragraph 2.07) proposed adjustments in the Progress Schedule that will not result in changing the Contract Times. Such adjustments will comply with any provisions of the General Requirements applicable thereto.

2. Proposed adjustments in the Progress Schedule that will change the Contract Times shall be submitted in accordance with the requirements of Article 12. Adjustments in Contract Times may only be made by a Change Order.

6.05 *Substitutes and "Or-Equals"*

A. Whenever an item of material or equipment is specified or described in the Contract Documents by using the name of a proprietary item, make or catalogue number, or the name of a particular Supplier, the specification or description is intended to establish the type, function, appearance, and quality required. Unless the specification or description contains or is followed by words reading that no like, equivalent, or "or-equal" item or no substitution is permitted, other items of material or equipment or material or equipment of other Suppliers may be submitted to Engineer for review under the circumstances described below.

1. *"Or-Equal" Items:* If in Engineer's sole discretion an item of material or equipment proposed by Contractor is functionally equal to that named and sufficiently similar so that no change in related Work will be required, it may be considered by Engineer as an "or-equal" item, in which case review and approval of the proposed item may, in Engineer's sole discretion, be accomplished without compliance with some or all of the requirements for approval of proposed substitute items. For the purposes of this Paragraph 6.05.A.1, a proposed item of material or equipment will be considered functionally equal to an item so named if:

a. in the exercise of reasonable judgment Engineer determines that:

1) it is at least equal in materials of construction, quality, durability, appearance, strength, and design characteristics;

2) it will reliably perform at least equally well the function and achieve the results imposed by the design concept of the completed Project as a functioning whole; and

3) it has a proven record of performance and availability of responsive service.

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b. Contractor certifies that, if approved and incorporated into the Work:

1) there will be no increase in cost to the Owner or increase in Contract Times; and

2) it will conform substantially to the detailed requirements of the item named in the Contract Documents.

2. Substitute Items:

a. If in Engineer's sole discretion an item of material or equipment proposed by Contractor does not qualify as an "or-equal" item under Paragraph 6.05.A.1, it will be considered a proposed substitute item.

b. Contractor shall submit sufficient information as provided below to allow Engineer to determine if the item of material or equipment proposed is essentially equivalent to that named and an acceptable substitute therefor. Requests for review of proposed substitute items of material or equipment will not be accepted by Engineer from anyone other than Contractor.

c. The requirements for review by Engineer will be as set forth in Paragraph 6.05.A.2.d, as supplemented by the General Requirements, and as Engineer may decide is appropriate under the circumstances.

d. Contractor shall make written application to Engineer for review of a proposed substitute item of material or equipment that Contractor seeks to furnish or use. The application:

1) shall certify that the proposed substitute item will:

a) perform adequately the functions and achieve the results called for by the general design,

b) be similar in substance to that specified, and

c) be suited to the same use as that specified;

2) will state:

a) the extent, if any, to which the use of the proposed substitute item will prejudice Contractor's achievement of Substantial Completion on time,

b) whether use of the proposed substitute item in the Work will require a change in any of the Contract Documents (or in the provisions of any other direct contract with Owner for other work on the Project) to adapt the design to the proposed substitute item, and

c) whether incorporation or use of the proposed substitute item in connection with the Work is subject to payment of any license fee or royalty;

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3) will identify:

a) all variations of the proposed substitute item from that specified, and

b) available engineering, sales, maintenance, repair, and replacement services; and

4) shall contain an itemized estimate of all costs or credits that will result directly or indirectly from use of such substitute item, including costs of redesign and claims of other contractors affected by any resulting change.

B. *Substitute Construction Methods or Procedures:* If a specific means, method, technique, sequence, or procedure of construction is expressly required by the Contract Documents, Contractor may furnish or utilize a substitute means, method, technique, sequence, or procedure of construction approved by Engineer. Contractor shall submit sufficient information to allow Engineer, in Engineer's sole discretion, to determine that the substitute proposed is equivalent to that expressly called for by the Contract Documents. The requirements for review by Engineer will be similar to those provided in Paragraph 6.05.A.2.

C. *Engineer's Evaluation:* Engineer will be allowed a reasonable time within which to evaluate each proposal or submittal made pursuant to Paragraphs 6.05.A and 6.05.B. Engineer may require Contractor to furnish additional data about the proposed substitute item. Engineer will be the sole judge of acceptability. No "or equal" or substitute will be ordered, installed or utilized until Engineer's review is complete, which will be evidenced by a Change Order in the case of a substitute and an approved Shop Drawing for an "or equal." Engineer will advise Contractor in writing of any negative determination.

D. *Special Guarantee:* Owner may require Contractor to furnish at Contractor's expense a special performance guarantee or other surety with respect to any substitute.

E. *Engineer's Cost Reimbursement*: Engineer will record Engineer's costs in evaluating a substitute proposed or submitted by Contractor pursuant to Paragraphs 6.05.A.2 and 6.05.B. Whether or not Engineer approves a substitute so proposed or submitted by Contractor, Contractor shall reimburse Owner for the reasonable charges of Engineer for evaluating each such proposed substitute. Contractor shall also reimburse Owner for the reasonable charges of Engineer for making changes in the Contract Documents (or in the provisions of any other direct contract with Owner) resulting from the acceptance of each proposed substitute.

F. *Contractor's Expense*: Contractor shall provide all data in support of any proposed substitute or "or-equal" at Contractor's expense.

6.06 *Concerning Subcontractors, Suppliers, and Others*

A. Contractor shall not employ any Subcontractor, Supplier, or other individual or entity (including those acceptable to Owner as indicated in Paragraph 6.06.B), whether initially or as a replacement, against whom Owner may have reasonable objection. Contractor shall not be required to employ any Subcontractor, Supplier, or other individual or entity to furnish or perform any of the Work against whom Contractor has reasonable objection.

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B. If the Bidding Requirements or Supplementary Conditions require the identity of certain Subcontractors, Suppliers, or other individuals or entities to be submitted to Owner in advance for acceptance by Owner by a specified date prior to the Effective Date of the Agreement, and ~~if~~ the Contractor has submitted a list thereof in accordance with the Bidding Requirements or Supplementary Conditions (which shall be included as an attachment to the Agreement), Owner's acceptance (either in writing or by failing to make written objection thereto by the date indicated for acceptance or objection in the Bidding Documents or the Contract Documents) of any such Subcontractor, Supplier, or other individual or entity so identified may be revoked on the basis of reasonable objection after due investigation. Contractor shall submit an acceptable replacement for the rejected Subcontractor, Supplier, or other individual or entity, and the Contract Price will be adjusted by the difference in the cost occasioned by such replacement, and an appropriate Change Order will be issued. No acceptance by Owner of any such Subcontractor, Supplier, or other individual or entity, whether initially or as a replacement, shall constitute a waiver of any right of Owner or Engineer to reject defective Work.

C. Contractor shall be fully responsible to Owner and Engineer for all acts and omissions of the Subcontractors, Suppliers, and other individuals or entities performing or furnishing any of the Work just as Contractor is responsible for Contractor's own acts and omissions. Nothing in the Contract Documents:

1. shall create for the benefit of any such Subcontractor, Supplier, or other individual or entity any contractual relationship between Owner or Engineer and any such Subcontractor, Supplier or other individual or entity; nor

2. shall create any obligation on the part of Owner or Engineer to pay or to see to the payment of any moneys due any such Subcontractor, Supplier, or other individual or entity except as may otherwise be required by Laws and Regulations.

D. Contractor shall be solely responsible for scheduling and coordinating the Work of Subcontractors, Suppliers, and other individuals or entities performing or furnishing any of the Work under a direct or indirect contract with Contractor.

E. Contractor shall require all Subcontractors, Suppliers, and such other individuals or entities performing or furnishing any of the Work to communicate with Engineer through Contractor.

F. The divisions and sections of the Specifications and the identifications of any Drawings shall not control Contractor in dividing the Work among Subcontractors or Suppliers or delineating the Work to be performed by any specific trade.

G. All Work performed for Contractor by a Subcontractor or Supplier will be pursuant to an appropriate agreement between Contractor and the Subcontractor or Supplier which specifically binds the Subcontractor or Supplier to the applicable terms and conditions of the Contract Documents for the benefit of Owner and Engineer.

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1. Whenever any such agreement is with a Subcontractor or Supplier who is listed as a loss payee on the property insurance provided in Paragraph 5.06, the agreement between the Contractor and the Subcontractor or Supplier will contain provisions whereby the Subcontractor or Supplier waives all rights against Owner, Contractor, Engineer, and all other individuals or entities identified in the Supplementary Conditions to be listed as insureds or loss payees (and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them) for all losses and damages caused by, arising out of, relating to, or resulting from any of the perils or causes of loss covered by such policies and any other property insurance applicable to the Work. If the insurers on any such policies require separate waiver forms to be signed by any Subcontractor or Supplier, Contractor will obtain the same.

6.07 *Patent Fees and Royalties*

A. Contractor shall pay all license fees and royalties and assume all costs incident to the use in the performance of the Work or the incorporation in the Work of any invention, design, process, product, or device which is the subject of patent rights or copyrights held by others. If a particular invention, design, process, product, or device is specified in the Contract Documents for use in the performance of the Work and if, to the actual knowledge of Owner or Engineer, its use is subject to patent rights or copyrights calling for the payment of any license fee or royalty to others, the existence of such rights shall be disclosed by Owner in the Contract Documents.

B. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, and its officers, directors, members, partners, employees, agents, consultants, and subcontractors from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals, and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device specified in the Contract Documents, but not identified as being subject to payment of any license fee or royalty to others required by patent rights or copyrights.

C. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device not specified in the Contract Documents.

D. At the Owner's option, Contractor shall defend claims in connection with any alleged infringement of such rights.

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6.08 *Permits*

A. Unless otherwise provided in the Supplementary Conditions, Contractor shall obtain and pay for all construction permits and licenses. Owner shall assist Contractor, when necessary, in obtaining such permits and licenses. Contractor shall pay all governmental charges and inspection fees necessary for the prosecution of the Work which are applicable at the time of opening of Bids, or, if there are no Bids, on the Effective Date of the Agreement. Owner shall pay all charges of utility owners for connections for providing permanent service to the Work.

6.09 *Laws and Regulations*

A. Contractor shall give all notices required by and shall comply with all Laws and Regulations applicable to the performance of the Work. Except where otherwise expressly required by applicable Laws and Regulations, neither Owner nor Engineer shall be responsible for monitoring Contractor's compliance with any Laws or Regulations.

B. If Contractor observes that the Specifications or Drawings are at variance with any Laws or Regulations, Contractor shall give Engineer prompt written notice thereof, and any necessary changes will be authorized by one of the methods set forth in Paragraph 3.04. If Contractor performs any Work knowing or having reason to know that it is contrary to Laws or Regulations, Contractor shall bear all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such Work. However, it shall not be Contractor's responsibility to make certain that the Specifications and Drawings are in accordance with Laws and Regulations, but this shall not relieve Contractor of Contractor's obligations under Paragraph 3.03.

C. Changes in Laws or Regulations not known at the time of opening of Bids (or, on the Effective Date of the Agreement if there were no Bids) having an effect on the cost or time of performance of the Work shall be the subject of an adjustment in Contract Price or Contract Times. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment, a Claim may be made therefor as provided in Paragraph 10.05.

6.10 *Taxes*

A. Contractor shall pay all sales, consumer, use, and other similar taxes required to be paid by Contractor in accordance with the Laws and Regulations of the place of the Project which are applicable during the performance of the Work.

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6.11 *Use of Site and Other Areas*

A. Limitation on Use of Site and Other Areas:

1. Contractor shall confine construction equipment, the storage of materials and equipment, and the operations of workers to the Site and other areas permitted by Laws and Regulations, and shall not unreasonably encumber the Site and other areas with construction equipment or other materials or equipment. Contractor shall assume full responsibility for any damage to any such land or area, or to the owner or occupant thereof, or of any adjacent land or areas resulting from the performance of the Work.

2. Should any claim be made by any such owner or occupant because of the performance of the Work, Contractor shall promptly settle with such other party by negotiation or otherwise resolve the claim by arbitration or other dispute resolution proceeding or at law.

3. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any claim or action, legal or equitable, brought by any such owner or occupant against Owner, Engineer, or any other party indemnified hereunder to the extent caused by or based upon Contractor's performance of the Work.

B. *Removal of Debris During Performance of the Work:* During the progress of the Work Contractor shall keep the Site and other areas free from accumulations of waste materials, rubbish, and other debris. Removal and disposal of such waste materials, rubbish, and other debris shall conform to applicable Laws and Regulations.

C. *Cleaning:* Prior to Substantial Completion of the Work Contractor shall clean the Site and the Work and make it ready for utilization by Owner. At the completion of the Work, Contractor shall remove from the Site all tools, appliances, construction equipment and machinery, and surplus materials and shall restore to original condition all property not designated for alteration by the Contract Documents.

D. *Loading Structures:* Contractor shall not load nor permit any part of any structure to be loaded in any manner that will endanger the structure, nor shall Contractor subject any part of the Work or adjacent property to stresses or pressures that will endanger it.

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6.12 *Record Documents*

A. Contractor shall maintain in a safe place at the Site one record copy of all Drawings, Specifications, Addenda, Change Orders, Work Change Directives, Field Orders, and written interpretations and clarifications in good order and annotated to show changes made during construction. These record documents together with all approved Samples and a counterpart of all approved Shop Drawings will be available to Engineer for reference. Upon completion of the Work, these record documents, Samples, and Shop Drawings and other closeout submittals specified will be delivered to Engineer for Owner.

6.13 *Safety and Protection*

A. Contractor shall be solely responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the Work. Such responsibility does not relieve Subcontractors of their responsibility for the safety of persons or property in the performance of their work, nor for compliance with applicable safety Laws and Regulations. Contractor shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury or loss to:

1. all persons on the Site or who may be affected by the Work;

2. all the Work and materials and equipment to be incorporated therein, whether in storage on or off the Site; and

3. other property at the Site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, utilities, and Underground Facilities not designated for removal, relocation, or replacement in the course of construction.

B. Contractor shall comply with all applicable Laws and Regulations relating to the safety of persons or property, or to the protection of persons or property from damage, injury, or loss; and shall erect and maintain all necessary safeguards for such safety and protection. Contractor shall notify owners of adjacent property and of Underground Facilities and other utility owners when prosecution of the Work may affect them, and shall cooperate with them in the protection, removal, relocation, and replacement of their property.

C. Contractor shall comply with the applicable requirements of Owner's safety programs, if any. The Supplementary Conditions identify any Owner's safety programs (if any) and other safety requirements that are applicable to the Work.

D. Contractor shall inform Owner and Engineer of the specific requirements of Contractor's safety program with which Owner's and Engineer's employees and representatives must comply while at the Site.

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E. All damage, injury, or loss to any property referred to in Paragraph 6.13.A.2 or 6.13.A.3 caused, directly or indirectly, in whole or in part, by Contractor, any Subcontractor, Supplier, or any other individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, shall be remedied by Contractor (except damage or loss attributable to the fault of Drawings or Specifications or to the acts or omissions of Owner or Engineer or anyone employed by any of them, or anyone for whose acts any of them may be liable, and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of Contractor or any Subcontractor, Supplier, or other individual or entity directly or indirectly employed by any of them).

F. Contractor's duties and responsibilities for safety and for protection of the Work shall continue until such time as all the Work is completed and Engineer has issued a notice to Owner and Contractor in accordance with Paragraph 14.07.B that the Work is acceptable (except as otherwise expressly provided in connection with Substantial Completion).

6.14 *Safety Representative*

A. Contractor shall designate a qualified and experienced safety representative at the Site whose duties and responsibilities shall be the prevention of accidents and the maintaining and supervising of safety precautions and programs.

6.15 *Hazard Communication Programs*

A. Contractor shall be responsible for coordinating any exchange of material safety data sheets or other hazard communication information required to be made available to or exchanged between or among employers at the Site in accordance with Laws or Regulations.

6.16 *Emergencies*

A. In emergencies affecting the safety or protection of persons or the Work or property at the Site or adjacent thereto, Contractor is obligated to act to prevent threatened damage, injury, or loss. Contractor shall give Engineer prompt written notice if Contractor believes that any significant changes in the Work or variations from the Contract Documents have been caused thereby or are required as a result thereof. If Engineer determines that a change in the Contract Documents is required because of the action taken by Contractor in response to such an emergency, a Work Change Directive or Change Order will be issued.

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6.17 *Shop Drawings and Samples*

A. Contractor shall submit Shop Drawings and Samples to Engineer for review and approval in accordance with the accepted Schedule of Submittals (as required by Paragraph 2.07). Each submittal will be identified as Engineer may require.

1. Shop Drawings:

a. Submit number of copies specified in the General Requirements.

b. Data shown on the Shop Drawings will be complete with respect to quantities, dimensions, specified performance and design criteria, materials, and similar data to show Engineer the services, materials, and equipment Contractor proposes to provide and to enable Engineer to review the information for the limited purposes required by Paragraph 6.17.D.

2. Samples:

a. Submit number of Samples specified in the Specifications.

b. Clearly identify each Sample as to material, Supplier, pertinent data such as catalog numbers, the use for which intended and other data as Engineer may require to enable Engineer to review the submittal for the limited purposes required by Paragraph 6.17.D.

B. Where a Shop Drawing or Sample is required by the Contract Documents or the Schedule of Submittals, any related Work performed prior to Engineer's review and approval of the pertinent submittal will be at the sole expense and responsibility of Contractor.

C. Submittal Procedures:

1. Before submitting each Shop Drawing or Sample, Contractor shall have:

a. reviewed and coordinated each Shop Drawing or Sample with other Shop Drawings and Samples and with the requirements of the Work and the Contract Documents;

b. determined and verified all field measurements, quantities, dimensions, specified performance and design criteria, installation requirements, materials, catalog numbers, and similar information with respect thereto;

c. determined and verified the suitability of all materials offered with respect to the indicated application, fabrication, shipping, handling, storage, assembly, and installation pertaining to the performance of the Work; and

d. determined and verified all information relative to Contractor's responsibilities for means, methods, techniques, sequences, and procedures of construction, and safety precautions and programs incident thereto.

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2. Each submittal shall bear a stamp or specific written certification that Contractor has satisfied Contractor's obligations under the Contract Documents with respect to Contractor's review and approval of that submittal.

3. With each submittal, Contractor shall give Engineer specific written notice of any variations that the Shop Drawing or Sample may have from the requirements of the Contract Documents. This notice shall be both a written communication separate from the Shop Drawings or Sample submittal; and, in addition, by a specific notation made on each Shop Drawing or Sample submitted to Engineer for review and approval of each such variation.

D. Engineer's Review:

1. Engineer will provide timely review of Shop Drawings and Samples in accordance with the Schedule of Submittals acceptable to Engineer. Engineer's review and approval will be only to determine if the items covered by the submittals will, after installation or incorporation in the Work, conform to the information given in the Contract Documents and be compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents.

2. Engineer's review and approval will not extend to means, methods, techniques, sequences, or procedures of construction (except where a particular means, method, technique, sequence, or procedure of construction is specifically and expressly called for by the Contract Documents) or to safety precautions or programs incident thereto. The review and approval of a separate item as such will not indicate approval of the assembly in which the item functions.

3. Engineer's review and approval shall not relieve Contractor from responsibility for any variation from the requirements of the Contract Documents unless Contractor has complied with the requirements of Paragraph 6.17.C.3 and Engineer has given written approval of each such variation by specific written notation thereof incorporated in or accompanying the Shop Drawing or Sample. Engineer's review and approval shall not relieve Contractor from responsibility for complying with the requirements of Paragraph 6.17.C.1. or for errors or omissions in a Shop Drawing or Sample.

E. Resubmittal Procedures:

1. Contractor shall make corrections required by Engineer and shall return the required number of corrected copies of Shop Drawings and submit, as required, new Samples for review and approval. Contractor shall direct specific attention in writing to revisions other than the corrections called for by Engineer on previous submittals.

6.18 *Continuing the Work*

A. Contractor shall carry on the Work and adhere to the Progress Schedule during all disputes or disagreements with Owner. No Work shall be delayed or postponed pending resolution of any disputes or disagreements, except as permitted by Paragraph 15.04 or as Owner and Contractor may otherwise agree in writing.

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6.19 *Contractor's General Warranty and Guarantee*

A. Contractor warrants and guarantees to Owner that all Work will be in accordance with the Contract Documents and in accordance with Subcontractor warranties, manufacturers and Suppliers warranties on equipment and material, and extended or special warranties and will not be defective for the correction period specified in 13.07. Owner and Engineer and ~~its~~ their officers, directors, members, partners, employees, agents, consultants, and subcontractors shall be entitled to rely on representation of Contractor's warranty and guarantee.

1. Contractor shall obtain and preserve for the benefit of the Owner:

a. manufacturers' and Suppliers' written warranties and guarantees on equipment and material incorporated into the Work;

b. written warranties and guarantees from each Subcontractor engaged in the performance of the Work; and

2. extended or special warranties.

B. Contractor's warranty and guarantee hereunder excludes defects or damage caused by:

1. abuse, modification, or improper maintenance or operation by persons other than Contractor, Subcontractors, Suppliers, or any other individual or entity for whom Contractor is responsible; or

2. normal wear and tear under normal usage.

C. Contractor's obligation to perform and complete the Work in accordance with the Contract Documents shall be absolute. None of the following will constitute an acceptance of Work that is not in accordance with the Contract Documents or a release of Contractor's obligation to perform the Work in accordance with the Contract Documents:

1. observations by Engineer;

2. recommendation by Engineer or payment by Owner of any progress or final payment;

3. the issuance of a certificate of Substantial Completion by Engineer or any payment related thereto by Owner;

4. use or occupancy of the Work or any part thereof by Owner;

5. any review and approval of a Shop Drawing or Sample submittal or the issuance of a notice of acceptability by Engineer;

6. any inspection, test, or approval by others; ~~or~~

7. any correction of defective Work by Owner; or~~.~~

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8. any acceptance by Owner or any failure to do so.

D. Contractor shall prepare and execute a written general warranty and guarantee applicable to the Work reflecting the provisions of this Paragraph 6.19, Article 13 and other applicable provisions of the Contract Documents pertaining to warranties and guarantees, Subcontractor, manufacturers and Supplier warranties and guarantees, and extended or special warranties and guarantees. Contractor shall submit this written general warranty and guarantee in accordance with Article 14 and the General Requirements.

E. Provision of any warranties or guarantees:

1. will not be effective to assign to Owner, or any of Owner's consultants, agents or employees, any duty or authority to supervise or direct the furnishing or performance of the Work or any duty or authority to undertake responsibility contrary to the provisions of Paragraph 8.09; and

2. will not be effective to assign to Engineer, or any of Engineer's consultants, agents or employees, any duty or authority to supervise or direct the furnishing or performance of the Work or any duty or authority to undertake responsibility contrary to the provisions of Paragraph 9.09.

F. The warranty and guarantee provisions of this Paragraph 6.19 shall be in addition to and not in limitation of any other warranties, guarantees or remedies allowed by Law or the Contract Documents.

6.20 *Indemnification*

A. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify, defend, and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to the performance of the Work, provided that any such claim, cost, loss, or damage is attributable to bodily injury, sickness, disease, or death, or to injury to or destruction of tangible property ~~(other than the Work itself)~~, including the loss of use resulting therefrom but only to the extent caused by any negligent or wrongful act or omission of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work or anyone for whose acts any of them may be liable .

B. In any and all claims against Owner or Engineer or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors by any employee (or the survivor or personal representative of such employee) of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, the indemnification obligation under Paragraph 6.20.A shall not be limited in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for Contractor or any such Subcontractor,

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Supplier, or other individual or entity under workers' compensation acts, disability benefit acts, or other employee benefit acts.

C. The indemnification obligations of Contractor under Paragraph 6.20.A shall not extend to the liability of Engineer and Engineer's officers, directors, members, partners, employees, agents, consultants and subcontractors arising out of:

1. the preparation or approval of , ~~or the failure to prepare or approve~~ maps, Drawings, opinions, reports, surveys, Change Orders, designs, or Specifications; or

2. giving directions or instructions, or failing to give them, if that is the primary cause of the injury or damage~~.~~; or

3. caused by the negligent acts, errors or omissions of any of them.

6.21 *Delegation of Professional Design Services*

A. Contractor will not be required to provide professional design services unless such services are specifically required by the Contract Documents for a portion of the Work or unless such services are required to carry out Contractor's responsibilities for construction means, methods, techniques, sequences and procedures. Contractor shall not be required to provide professional services in violation of applicable law.

B. If professional design services or certifications by a design professional related to systems, materials or equipment are specifically required of Contractor by the Contract Documents, Owner and Engineer will specify all performance and design criteria that such services must satisfy. Contractor shall cause such services or certifications to be provided by a properly licensed professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, Shop Drawings and other submittals prepared by such professional. Shop Drawings and other submittals related to the Work designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to Engineer.

C. Owner and Engineer shall be entitled to rely upon the adequacy, accuracy and completeness of the services, certifications or approvals performed by such design professionals, provided Owner and Engineer have specified to Contractor all performance and design criteria that such services must satisfy.

D. Pursuant to this Paragraph 6.21, Engineer's review and approval of design calculations and design drawings will be only for the limited purpose of checking for conformance with performance and design criteria given and the design concept expressed in the Contract Documents. Engineer's review and approval of Shop Drawings and other submittals (except design calculations and design drawings) will be only for the purpose stated in Paragraph 6.17.D.1.

E. Contractor shall not be responsible for the adequacy of the performance or design criteria required by the Contract Documents.

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ARTICLE 7 – OTHER WORK AT THE SITE

7.01 *Related Work at Site*

A. Owner may perform other work related to the Project at the Site with Owner's employees, or through other direct contracts therefor, or have other work performed by utility owners. If such other work is not noted in the Contract Documents, then:

1. written notice thereof will be given to Contractor prior to starting any such other work; and

2. if Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times that should be allowed as a result of such other work, a Claim may be made therefor as provided in Paragraph 10.05.

B. Contractor shall afford each other contractor who is a party to such a direct contract, each utility owner, and Owner, if Owner is performing other work with Owner's employees, proper and safe access to the Site, provide a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such other work, and properly coordinate the Work with theirs. Contractor shall do all cutting, fitting, and patching of the Work that may be required to properly connect or otherwise make its several parts come together and properly integrate with such other work. Contractor shall not endanger any work of others by cutting, excavating, or otherwise altering such work; provided, however, that Contractor may cut or alter others' work with the written consent of Engineer and the others whose work will be affected. ~~The duties and responsibilities of Contractor under this Paragraph are for the benefit of such utility owners and other contractors to the extent that there are comparable provisions for the benefit of Contractor in said direct contracts between Owner and such utility owners and other contractors.~~

C. If the proper execution or results of any part of Contractor's Work depends upon work performed by others under this Article 7, Contractor shall inspect such other work and promptly report to Engineer in writing any delays, defects, or deficiencies in such other work that render it unavailable or unsuitable for the proper execution and results of Contractor's Work. Contractor's failure to so report will constitute an acceptance of such other work as fit and proper for integration with Contractor's Work except for latent defects and deficiencies in such other work.

7.02 *Coordination*

A. If Owner intends to contract with others for the performance of other work on the Project at the Site, the following will be set forth in Supplementary Conditions:

1. the individual or entity who will have authority and responsibility for coordination of the activities among the various contractors will be identified;

2. the specific matters to be covered by such authority and responsibility will be itemized; and

3. the extent of such authority and responsibilities will be provided.

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B. Unless otherwise provided in the Supplementary Conditions, Owner shall have sole authority and responsibility for such coordination.

7.03 *Legal Relationships*

A. Paragraphs 7.01.A and 7.02 are not applicable for utilities not under the control of Owner.

B. Each other direct contract of Owner under Paragraph 7.01.A shall provide that the other contractor is liable to Owner and Contractor for the reasonable direct delay and disruption costs incurred by Contractor as a result of the other contractor's wrongful actions or inactions.

C. Contractor shall be liable to Owner and any other contractor under direct contract to Owner for the reasonable direct delay and disruption costs incurred by such other contractor as a result of Contractor's wrongful action or inactions.

ARTICLE 8 – OWNER'S RESPONSIBILITIES

8.01 *Communications to Contractor*

A. Except as otherwise provided in these General Conditions, Owner shall issue all communications to Contractor through Engineer.

8.02 *Replacement of Engineer*

A. In case of termination of the employment of Engineer, Owner shall appoint an engineer ~~to whom Contractor makes no reasonable objection,~~ whose status under the Contract Documents shall be that of the former Engineer.

8.03 *Furnish Data*

A. Owner shall promptly furnish the data required of Owner under the Contract Documents.

8.04 *Pay When Due*

A. Owner shall make payments to Contractor when they are due as provided in Paragraphs 14.02.C and 14.07.C.

8.05 *Lands and Easements; Reports and Tests*

A. Owner's duties with respect to providing lands and easements and providing engineering surveys to establish reference points are set forth in Paragraphs 4.01 and 4.05. Paragraph 4.02 refers to Owner's identifying and making available to Contractor copies of reports of explorations and tests of subsurface conditions and drawings of physical conditions relating to existing surface or subsurface structures at the Site.

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8.06 *Insurance*

A. Owner's responsibilities, if any, with respect to purchasing and maintaining liability and property insurance are set forth in Article 5.

8.07 *Change Orders*

A. Owner is obligated to execute Change Orders as indicated in Paragraph 10.03.

8.08 *Inspections, Tests, and Approvals*

A. Owner's responsibility with respect to certain inspections, tests, and approvals is set forth in Paragraph 13.03.B.

8.09 *Limitations on Owner's Responsibilities*

A. The Owner shall not supervise, direct, or have control or authority over, nor be responsible for, Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. However, the Owner shall have the right to direct the Contractor to perform the Work according to any sequence schedule set forth in the Contract Documents or established pursuant thereto. Owner will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.

8.10 *Undisclosed Hazardous Environmental Condition*

A. Owner's responsibility in respect to an undisclosed Hazardous Environmental Condition is set forth in Paragraph 4.06.

8.11 *Evidence of Financial Arrangements*

A. Upon request of Contractor, Owner shall furnish Contractor reasonable evidence that financial arrangements have been made to satisfy Owner's obligations under the Contract Documents.

8.12 *Compliance with Safety Program*

A. While at the Site, Owner's employees and representatives shall comply with the specific applicable requirements of Contractor's safety programs of which Owner has been informed pursuant to Paragraph 6.13.D.

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ARTICLE 9 – ENGINEER'S STATUS DURING CONSTRUCTION

9.01 *Owner's Representative*

A. Engineer will be Owner's representative during the construction period. The duties and responsibilities and the limitations of authority of Engineer as Owner's representative during construction are set forth in the Contract Documents.

9.02 *Visits to Site*

A. Engineer will make visits to the Site at intervals appropriate to the various stages of construction as Engineer deems necessary in order to observe as an experienced and qualified design professional the progress that has been made and the quality of the various aspects of Contractor's executed Work. Based on information obtained during such visits and observations, Engineer, for the benefit of Owner, will determine, in general, if the Work is proceeding in accordance with the Contract Documents. Engineer will not be required to make exhaustive or continuous inspections on the Site to check the quality or quantity of the Work. Engineer's efforts will be directed toward providing for Owner a greater degree of confidence that the completed Work will conform generally to the Contract Documents. On the basis of such visits and observations, Engineer will keep Owner informed of the progress of the Work and will endeavor to guard Owner against defective Work.

B. Engineer's visits and observations are subject to all the limitations on Engineer's authority and responsibility set forth in Paragraph 9.09. Particularly, but without limitation, during or as a result of Engineer's visits or observations of Contractor's Work, Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. However, the Engineer shall have the right to direct the Contractor to perform the Work according to any sequence schedule set forth in the Contract Documents or established pursuant thereto.

9.03 *Project Representative*

A. If Owner and Engineer agree, Engineer will furnish a Resident Project Representative to assist Engineer in providing more extensive observation of the Work. The authority and responsibilities of any such Resident Project Representative and assistants will be as provided in the Supplementary Conditions, and limitations on the responsibilities thereof will be as provided in Paragraph 9.09. If Owner designates another representative or agent to represent Owner at the Site who is not Engineer's consultant, agent or employee, the responsibilities and authority and limitations thereon of such other individual or entity will be as provided in the Supplementary Conditions.

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9.04 *Authorized Variations in Work*

A. Engineer may authorize minor variations in the Work from the requirements of the Contract Documents which do not involve an adjustment in the Contract Price or the Contract Times and are compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. These may be accomplished by a Field Order and will be binding on Owner and also on Contractor, who shall perform the Work involved promptly. If Owner or Contractor believes that a Field Order justifies an adjustment in the Contract Price or Contract Times, or both, and the parties are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment, a Claim may be made therefor as provided in Paragraph 10.05.

9.05 *Rejecting Defective Work*

A. Engineer will have authority to reject Work which Engineer believes to be defective, or that Engineer believes will not produce a completed Project that conforms to the Contract Documents or that will prejudice the integrity of the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. Engineer will also have authority to require special inspection or testing of the Work as provided in Paragraph 13.04, whether or not the Work is fabricated, installed, or completed.

9.06 *Shop Drawings, Change Orders and Payments*

A. In connection with Engineer's authority, and limitations thereof, as to Shop Drawings and Samples, see Paragraph 6.17.

B. In connection with Engineer's authority, and limitations thereof, as to design calculations and design drawings submitted in response to a delegation of professional design services, if any, see Paragraph 6.21.

C. In connection with Engineer's authority as to Change Orders, see Articles 10, 11, and 12.

D. In connection with Engineer's authority as to Applications for Payment, see Article 14.

9.07 *Determinations for Unit Price Work*

A. Engineer will determine the actual quantities and classifications of Unit Price Work performed by Contractor. Engineer will review with Contractor the Engineer's preliminary determinations on such matters before rendering a written decision thereon (by recommendation of an Application for Payment or otherwise). Engineer's written decision thereon will be final and binding (except as modified by Engineer to reflect changed factual conditions or more accurate data) upon Owner and Contractor, subject to the provisions of Paragraph 10.05.

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9.08 *Decisions on Requirements of Contract Documents and Acceptability of Work*

A. Engineer will be the initial interpreter of the requirements of the Contract Documents and judge of the acceptability of the Work thereunder. All matters in question and other matters between Owner and Contractor arising prior to the date final payment is due relating to the acceptability of the Work, and the interpretation of the requirements of the Contract Documents pertaining to the performance of the Work, will be referred initially to Engineer in writing within 30 days of the event giving rise to the question.

B. Engineer will, with reasonable promptness, render a written decision on the issue referred. If Owner or Contractor believes that any such decision entitles them to an adjustment in the Contract Price or Contract Times or both, a Claim may be made under Paragraph 10.05. The date of Engineer's decision shall be the date of the event giving rise to the issues referenced for the purposes of Paragraph 10.05.B.

C. Engineer's written decision on the issue referred will be final and binding on Owner and Contractor, subject to the provisions of Paragraph 10.05.

D. When functioning as interpreter and judge under this Paragraph 9.08, Engineer will not show partiality to Owner or Contractor and will not be liable in connection with any interpretation or decision rendered in good faith in such capacity.

9.09 *Limitations on Engineer's Authority and Responsibilities*

A. Neither Engineer's authority or responsibility under this Article 9 or under any other provision of the Contract Documents nor any decision made by Engineer in good faith either to exercise or not exercise such authority or responsibility or the undertaking, exercise, or performance of any authority or responsibility by Engineer shall create, impose, or give rise to any duty in contract, tort, or otherwise owed by Engineer to Contractor, any Subcontractor, any Supplier, any other individual or entity, or to any surety for or employee or agent of any of them.

B. Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. However, the Engineer shall have the right to direct the Contractor to perform the Work according to any sequence schedule set forth in the Contract Documents or established pursuant thereto. Engineer will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.

C. Engineer will not be responsible for the acts or omissions of Contractor or of any Subcontractor, any Supplier, or of any other individual or entity performing any of the Work.

D. Engineer's review of the final Application for Payment and accompanying documentation and all maintenance and operating instructions, schedules, guarantees, bonds, certificates of inspection, tests and approvals, and other documentation required to be delivered by Paragraph 14.07.A will only be to determine generally that their content complies with the requirements of, and in the

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case of certificates of inspections, tests, and approvals that the results certified indicate compliance with, the Contract Documents.

E. The limitations upon authority and responsibility set forth in this Paragraph 9.09 shall also apply to the Resident Project Representative, if any, and assistants, if any.

9.10 *Compliance with Safety Program*

A. While at the Site, Engineer's employees and representatives shall comply with the specific applicable requirements of Contractor's safety programs of which Engineer has been informed pursuant to Paragraph 6.13.D.

ARTICLE 10 – CHANGES IN THE WORK; CLAIMS

10.01 *Authorized Changes in the Work*

A. Without invalidating the Contract and without notice to any surety, Owner may, at any time or from time to time, order additions, deletions, or revisions in the Work by a Change Order, or a Work Change Directive. Upon receipt of any such document, Contractor shall promptly proceed with the Work involved which will be performed under the applicable conditions of the Contract Documents (except as otherwise specifically provided).

B. If Owner and Contractor are unable to agree on entitlement to, or on the amount or extent, if any, of an adjustment in the Contract Price or Contract Times, or both, that should be allowed as a result of a Work Change Directive, a Claim may be made therefor as provided in Paragraph 10.05.

10.02 *Unauthorized Changes in the Work*

A. Contractor shall not be entitled to an increase in the Contract Price or an extension of the Contract Times with respect to any work performed that is not required by the Contract Documents as amended, modified, or supplemented as provided in Paragraph 3.04, except in the case of an emergency as provided in Paragraph 6.16 or in the case of uncovering Work as provided in Paragraph 13.04.D.

10.03 *Execution of Change Orders*

A. Owner and Contractor shall execute appropriate Change Orders recommended by Engineer covering:

1. changes in the Work which are: (i) ordered by Owner pursuant to Paragraph 10.01.A, (ii) required because of acceptance of defective Work under Paragraph 13.08.A or Owner's correction of defective Work under Paragraph 13.09, or (iii) agreed to by the parties;

2. changes in the Contract Price or Contract Times which are agreed to by the parties, including any undisputed sum or amount of time for Work actually performed in accordance with a Work Change Directive; and

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3. changes in the Contract Price or Contract Times which embody the substance of any written decision rendered by Engineer pursuant to Paragraph 10.05; provided that, in lieu of executing any such Change Order, an appeal may be taken from any such decision in accordance with the provisions of the Contract Documents and applicable Laws and Regulations, but during any such appeal, Contractor shall carry on the Work and adhere to the Progress Schedule as provided in Paragraph 6.18.A.

10.04 *Notification to Surety*

A. If the provisions of any bond require notice to be given to a surety of any change affecting the general scope of the Work or the provisions of the Contract Documents (including, but not limited to, Contract Price or Contract Times), the giving of any such notice will be Contractor's responsibility. The amount of each applicable bond will be adjusted to reflect the effect of any such change.

10.05 *Claims*

A. *Engineer's Decision Required*: All Claims, except those waived pursuant to Paragraph 14.09, shall be referred to the Engineer for decision. A decision by Engineer shall be required as a condition precedent to any exercise by Owner or Contractor of any rights or remedies either may otherwise have under the Contract Documents or by Laws and Regulations in respect of such Claims.

B. *Notice:* Written notice stating the general nature of each Claim shall be delivered by the claimant to Engineer and the other party to the Contract promptly (but in no event later than ~~30~~ 14 days) after the start of the event giving rise thereto. Failure to comply with this notice requirement shall constitute a waiver of the Claim. The responsibility to substantiate a Claim shall rest with the party making the Claim. Notice of the amount or extent of the Claim, with supporting data shall be delivered to the Engineer and the other party to the Contract within ~~60~~ 30 days after the start of such event (unless Engineer allows additional time for claimant to submit additional or more accurate data in support of such Claim). A Claim for an adjustment in Contract Price shall be prepared in accordance with the provisions of Paragraph 12.01.B. A Claim for an adjustment in Contract Times shall be prepared in accordance with the provisions of Paragraph 12.02.B. Each Claim shall be accompanied by claimant's written statement that the adjustment claimed is the entire adjustment to which the claimant believes it is entitled as a result of said event. The opposing party shall submit any response to Engineer and the claimant within 30 days after receipt of the claimant's last submittal (unless Engineer allows additional time).

C. *Engineer's Action*: Engineer will review each Claim and, within 30 days after receipt of the last submittal of the claimant or the last submittal of the opposing party, if any, take one of the following actions in writing:

1. deny the Claim in whole or in part;

2. approve the Claim; or

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3. notify the parties that the Engineer is unable to resolve the Claim if, in the Engineer's sole discretion, it would be inappropriate for the Engineer to do so. For purposes of further resolution of the Claim, such notice shall be deemed a denial.

D. In the event that Engineer does not take action on a Claim within said 30 days, the Claim shall be deemed denied.

E. Engineer's written action under Paragraph 10.05.C or denial pursuant to Paragraphs 10.05.C.3 or 10.05.D will be final and binding upon Owner and Contractor, unless Owner or Contractor invoke the dispute resolution procedure set forth in Article 16 within 30 days of such action or denial.

F. No Claim for an adjustment in Contract Price or Contract Times will be valid if not submitted in accordance with this Paragraph 10.05.

G. Contractor shall not have the right to stop performance of the Work pending resolution of a Claim.

ARTICLE 11 – COST OF THE WORK; ALLOWANCES; UNIT PRICE WORK

11.01 *Cost of the Work*

A. *Costs Included:* The term Cost of the Work means the sum of all costs, except those excluded in Paragraph 11.01.B, necessarily incurred and paid by Contractor in the proper performance of the Work. When the value of any Work covered by a Change Order or when a Claim for an adjustment in Contract Price is determined on the basis of Cost of the Work, the costs to be reimbursed to Contractor will be only those additional or incremental costs required because of the change in the Work or because of the event giving rise to the Claim. Except as otherwise may be agreed to in writing by Owner, such costs shall be in amounts no higher than those prevailing in the locality of the Project, shall not include any of the costs itemized in Paragraph 11.01.B, and shall include only the following items:

1. Payroll costs for employees in the direct employ of Contractor in the performance of the Work under schedules of job classifications agreed upon by Owner and Contractor. Such employees shall include, without limitation, superintendents, foremen, and other personnel employed full time on the Work. Payroll costs for employees not employed full time on the Work shall be apportioned on the basis of their time spent on the Work. Payroll costs shall include, but not be limited to, salaries and wages plus the cost of fringe benefits, which shall include social security contributions, unemployment, excise, and payroll taxes, workers' compensation, health and retirement benefits, bonuses, sick leave, vacation and holiday pay applicable thereto. The expenses of performing Work outside of regular working hours, on Saturday, Sunday, or legal holidays, shall be included in the above to the extent authorized by Owner.

2. Cost of all materials and equipment furnished and incorporated in the Work, including costs of transportation and storage thereof, and Suppliers' field services required in connection therewith. All cash discounts shall accrue to Contractor unless Owner deposits funds with Contractor with which to make payments, in which case the cash discounts shall accrue to Owner. All trade discounts, rebates and refunds and returns from sale of surplus materials

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and equipment shall accrue to Owner, and Contractor shall make provisions so that they may be obtained.

3. Payments made by Contractor to Subcontractors for Work performed by Subcontractors. If required by Owner, Contractor shall obtain competitive bids from subcontractors acceptable to Owner and Contractor and shall deliver such bids to Owner, who will then determine, with the advice of Engineer, which bids, if any, will be acceptable. If any subcontract provides that the Subcontractor is to be paid on the basis of Cost of the Work plus a fee, the Subcontractor's Cost of the Work and fee shall be determined in the same manner as Contractor's Cost of the Work and fee as provided in this Paragraph 11.01.

4. Costs of special consultants (including but not limited to engineers, architects, testing laboratories, surveyors, attorneys, and accountants) employed for services specifically related to the Work.

5. Supplemental costs including the following:

    a. The proportion of necessary transportation, travel, and subsistence expenses of Contractor's employees incurred in discharge of duties connected with the Work.

    b. Cost, including transportation and maintenance, of all materials, supplies, equipment, machinery, appliances, office, and temporary facilities at the Site, and hand tools not owned by the workers, which are consumed in the performance of the Work, and cost, less market value, of such items used but not consumed which remain the property of Contractor.

    c. Rentals of all construction equipment and machinery, and the parts thereof whether rented from Contractor or others in accordance with rental agreements approved by Owner with the advice of Engineer, and the costs of transportation, loading, unloading, assembly, dismantling, and removal thereof. All such costs shall be in accordance with the terms of said rental agreements. The rental of any such equipment, machinery, or parts shall cease when the use thereof is no longer necessary for the Work.

    d. Sales, consumer, use, and other similar taxes related to the Work, and for which Contractor is liable, as imposed by Laws and Regulations.

    e. Deposits lost for causes other than negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, and royalty payments and fees for permits and licenses.

    f. Losses and damages (and related expenses) caused by damage to the Work, not compensated by insurance or otherwise, sustained by Contractor in connection with the performance of the Work (except losses and damages within the deductible amounts of property insurance established in accordance with Paragraph 5.06.D), provided such losses and damages have resulted from causes other than the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable. Such losses shall include settlements made with

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the written consent and approval of Owner. No such losses, damages, and expenses shall be included in the Cost of the Work for the purpose of determining Contractor's fee.

g. The cost of utilities, fuel, and sanitary facilities at the Site.

h. Minor expenses such as telegrams, long distance telephone calls, telephone service at the Site, express and courier services, and similar petty cash items in connection with the Work.

i. The costs of premiums for all bonds and insurance Contractor is required by the Contract Documents to purchase and maintain.

B. *Costs Excluded:* The term Cost of the Work shall not include any of the following items:

1. Payroll costs and other compensation of Contractor's officers, executives, principals (of partnerships and sole proprietorships), general managers, safety managers, engineers, architects, estimators, attorneys, auditors, accountants, purchasing and contracting agents, expediters, timekeepers, clerks, and other personnel employed by Contractor, whether at the Site or in Contractor's principal or branch office for general administration of the Work and not specifically included in the agreed upon schedule of job classifications referred to in Paragraph 11.01.A.1 or specifically covered by Paragraph 11.01.A.4, all of which are to be considered administrative costs covered by the Contractor's fee.

2. Expenses of Contractor's principal and branch offices other than Contractor's office at the Site.

3. Any part of Contractor's capital expenses, including interest on Contractor's capital employed for the Work and charges against Contractor for delinquent payments.

4. Costs due to the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, including but not limited to, the correction of defective Work, disposal of materials or equipment wrongly supplied, and making good any damage to property.

5. Other overhead or general expense costs of any kind and the costs of any item not specifically and expressly included in Paragraphs 11.01.A.

C. *Contractor's Fee:* When all the Work is performed on the basis of cost-plus, Contractor's fee shall be determined as set forth in the Agreement. When the value of any Work covered by a Change Order or when a Claim for an adjustment in Contract Price is determined on the basis of Cost of the Work, Contractor's fee shall be determined as set forth in Paragraph 12.01.C.

D. *Documentation:* Whenever the Cost of the Work for any purpose is to be determined pursuant to Paragraphs 11.01.A and 11.01.B, Contractor will establish and maintain records thereof in accordance with generally accepted accounting practices and submit in a form acceptable to Engineer an itemized cost breakdown together with supporting data.

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11.02 *Allowances*

A. It is understood that Contractor has included in the Contract Price all allowances so named in the Contract Documents and shall cause the Work so covered to be performed for such sums and by such persons or entities as may be acceptable to Owner and Engineer.

B. Cash Allowances:

1. Contractor agrees that:

a. the cash allowances include the cost to Contractor (less any applicable trade discounts) of materials and equipment required by the allowances to be delivered at the Site, and all applicable taxes; and

b. Contractor's costs for unloading and handling on the Site, labor, installation, overhead, profit, and other expenses contemplated for the cash allowances have been included in the Contract Price and not in the allowances, and no demand for additional payment on account of any of the foregoing will be valid.

C. Contingency Allowance:

1. Contractor agrees that a contingency allowance, if any, is for the sole use of Owner to cover unanticipated costs.

D. Prior to final payment, an appropriate Change Order will be issued as recommended by Engineer to reflect actual amounts due Contractor on account of Work covered by allowances, and the Contract Price shall be correspondingly adjusted.

11.03 *Unit Price Work*

A. Where the Contract Documents provide that all or part of the Work is to be Unit Price Work, initially the Contract Price will be deemed to include for all Unit Price Work an amount equal to the sum of the unit price for each separately identified item of Unit Price Work times the estimated quantity of each item as indicated in the Agreement.

B. The estimated quantities of items of Unit Price Work are not guaranteed and are solely for the purpose of comparison of Bids and determining an initial Contract Price. Determinations of the actual quantities and classifications of Unit Price Work performed by Contractor will be made by Engineer subject to the provisions of Paragraph 9.07.

C. Each unit price will be deemed to include an amount considered by Contractor to be adequate to cover Contractor's overhead and profit for each separately identified item.

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~~D. Owner or Contractor may make a Claim for an adjustment in the Contract Price in accordance with Paragraph 10.05 if:~~

~~1. the quantity of any item of Unit Price Work performed by Contractor differs materially and significantly from the estimated quantity of such item indicated in the Agreement; and~~

~~2. there is no corresponding adjustment with respect to any other item of Work; and~~

~~3. Contractor believes that Contractor is entitled to an increase in Contract Price as a result of having incurred additional expense or Owner believes that Owner is entitled to a decrease in Contract Price and the parties are unable to agree as to the amount of any such increase or decrease.~~

ARTICLE 12 – CHANGE OF CONTRACT PRICE; CHANGE OF CONTRACT TIMES

12.01 *Change of Contract Price*

A. The Contract Price may only be changed by a Change Order. Any Claim for an adjustment in the Contract Price shall be based on written notice submitted by the party making the Claim to the Engineer and the other party to the Contract in accordance with the provisions of Paragraph 10.05.

B. The value of any Work covered by a Change Order or of any Claim for an adjustment in the Contract Price will be determined as follows:

1. where the Work involved is covered by unit prices contained in the Contract Documents, by application of such unit prices to the quantities of the items involved (subject to the provisions of Paragraph 11.03); or

2. where the Work involved is not covered by unit prices contained in the Contract Documents, by a mutually agreed lump sum (which may include an allowance for overhead and profit not necessarily in accordance with Paragraph 12.01.C.2); or

3. where the Work involved is not covered by unit prices contained in the Contract Documents and agreement to a lump sum is not reached under Paragraph 12.01.B.2, on the basis of the Cost of the Work (determined as provided in Paragraph 11.01) plus a Contractor's fee for overhead and profit (determined as provided in Paragraph 12.01.C).

C. *Contractor's Fee:* The Contractor's fee for overhead and profit shall be determined as follows:

1. a mutually acceptable fixed fee; or

2. if a fixed fee is not agreed upon, then a fee based on the following percentages of the various portions of the Cost of the Work:

a. for costs incurred under Paragraphs 11.01.A.1 and 11.01.A.2, the Contractor's fee shall be ~~15~~ 10 percent;

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b. for costs incurred under Paragraph 11.01.A.3, the Contractor's fee shall be five percent;

c. where one or more tiers of subcontracts are on the basis of Cost of the Work plus a fee and no fixed fee is agreed upon, the intent of Paragraphs 12.01.C.2.a and 12.01.C.2.b is that the Subcontractor who actually performs the Work, at whatever tier, will be paid a fee of ~~15~~ 10 percent of the costs incurred by such Subcontractor under Paragraphs 11.01.A.1 and 11.01.A.2 and that any higher tier Subcontractor and Contractor will each be paid a fee of five percent of the amount paid to the next lower tier Subcontractor, provided, however, that on any subcontracted work the total maximum fee to be paid by Owner under this subparagraph shall be no greater than 27 percent of the costs incurred by the Subcontractor who actually performs the Work;

d. no fee shall be payable on the basis of costs itemized under Paragraphs 11.01.A.4, 11.01.A.5, and 11.01.B;

e. the amount of credit to be allowed by Contractor to Owner for any change which results in a net decrease in cost will be the amount of the actual net decrease in cost plus a deduction in Contractor's fee by an amount equal to five percent of such net decrease; and

f. when both additions and credits are involved in any one change, the adjustment in Contractor's fee shall be computed on the basis of the net change in accordance with Paragraphs 12.01.C.2.a through 12.01.C.2.e, inclusive.

12.02 *Change of Contract Times*

A. The Contract Times may only be changed by a Change Order. Any Claim for an adjustment in the Contract Times shall be based on written notice submitted by the party making the Claim to the Engineer and the other party to the Contract in accordance with the provisions of Paragraph 10.05.

B. Any adjustment of the Contract Times covered by a Change Order or any Claim for an adjustment in the Contract Times will be determined in accordance with the provisions of this Article 12.

12.03 *Delays*

A. Where Contractor is prevented from completing any part of the Work within the Contract Times due to delay beyond the control of Contractor, the Contract Times will be extended in an amount equal to the time lost due to such delay if a Claim is made therefor as provided in Paragraph 12.02.A. Delays beyond the control of Contractor shall include, but not be limited to, acts or neglect by Owner, acts or neglect of utility owners or other contractors performing other work as contemplated by Article 7, fires, floods, epidemics, abnormal weather conditions, acts of war or terrorism, or acts of God (force majeure).

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B. If Owner, Engineer, or other contractors or utility owners performing other work for Owner as contemplated by Article 7, or anyone for whom Owner is responsible, delays, disrupts, or interferes with the performance or progress of the Work, then Contractor shall be entitled to an equitable adjustment in the Contract Price or the Contract Times, or both. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times.

C. If Contractor is delayed in the performance or progress of the Work by fire, flood, epidemic, abnormal weather conditions, acts of war or terrorism, acts of God, acts or failures to act of utility owners not under the control of Owner, or other causes not the fault of and beyond control of Owner and Contractor, then Contractor shall be entitled to an equitable adjustment in Contract Times, if such adjustment is essential to Contractor's ability to complete the Work within the Contract Times. Such an adjustment shall be Contractor's sole and exclusive remedy for the delays described in this Paragraph 12.03.C.

D. Owner, Engineer, and their officers, directors, members, partners, employees, agents, consultants, or subcontractors shall not be liable to Contractor for any claims, costs, losses, or damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by Contractor on or in connection with any other project or anticipated project.

E. Contractor shall not be entitled to an adjustment in Contract Price or Contract Times for delays within the control of Contractor. Delays attributable to and within the control of a Subcontractor or Supplier shall be deemed to be delays within the control of Contractor.

ARTICLE 13 – TESTS AND INSPECTIONS; CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK

13.01 *Notice of Defects*

A. Prompt notice of all defective Work of which Owner or Engineer has actual knowledge will be given to Contractor. Defective Work may be rejected, corrected, or accepted as provided in this Article 13.

13.02 *Access to Work*

A. Owner, Engineer, their consultants and other representatives and personnel of Owner, independent testing laboratories, and governmental agencies with jurisdictional interests will have access to the Site and the Work at reasonable times for their observation, inspection, and testing. Contractor shall provide them proper and safe conditions for such access and advise them of Contractor's safety procedures and programs so that they may comply therewith as applicable.

13.03 *Tests and Inspections*

A. Contractor shall give Engineer timely notice of readiness of the Work for all required inspections, tests, or approvals and shall cooperate with inspection and testing personnel to facilitate required inspections or tests.

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B. Owner shall employ and pay for the services of an independent testing laboratory to perform all inspections, tests, or approvals required by the Contract Documents except:

1. for inspections, tests, or approvals covered by Paragraphs 13.03.C and 13.03.D below;

2. that costs incurred in connection with tests or inspections conducted pursuant to Paragraph 13.04.B shall be paid as provided in Paragraph 13.04.C; and

3. as otherwise specifically provided in the Contract Documents.

C. If Laws or Regulations of any public body having jurisdiction require any Work (or part thereof) specifically to be inspected, tested, or approved by an employee or other representative of such public body, Contractor shall assume full responsibility for arranging and obtaining such inspections, tests, or approvals, pay all costs in connection therewith, and furnish Engineer the required certificates of inspection or approval.

D. Except as provided in 13.03.B above and where responsibility for a specific inspection or test is expressly allocated to Owner in the Specifications or by Laws and Regulations, Contractor shall be responsible for arranging and obtaining and shall pay all costs in connection with any inspections, tests, or approvals required for Owner's and Engineer's acceptance of materials or equipment to be incorporated in the Work; or acceptance of materials, mix designs, or equipment submitted for approval prior to Contractor's purchase thereof for incorporation in the Work. Such inspections, tests, or approvals shall be performed by organizations acceptable to Owner and Engineer.

E. If any Work (or the work of others) that is to be inspected, tested, or approved is covered by Contractor without written concurrence of Engineer, Contractor shall, if requested by Engineer, uncover such Work for observation.

F. Uncovering Work as provided in Paragraph 13.03.E shall be at Contractor's expense. ~~unless Contractor has given Engineer timely notice of Contractor's intention to cover the same and Engineer has not acted with reasonable promptness in response to such notice.~~

13.04 *Uncovering Work*

A. If any Work is covered contrary to the written request of Engineer, it must, if requested by Engineer, be uncovered for Engineer's observation and replaced at Contractor's expense.

B. If Engineer considers it necessary or advisable that covered Work be observed by Engineer or inspected or tested by others, Contractor, at Engineer's request, shall uncover, expose, or otherwise make available for observation, inspection, or testing as Engineer may require, that portion of the Work in question, furnishing all necessary labor, material, and equipment.

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C. If it is found that the uncovered Work is defective, Contractor shall pay all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such uncovering, exposure, observation, inspection, and testing, and of satisfactory replacement or reconstruction (including but not limited to all costs of repair or replacement of work of others); and Owner shall be entitled to an appropriate decrease in the Contract Price. If the parties are unable to agree as to the amount thereof, Owner may make a Claim therefor as provided in Paragraph 10.05.

D. If the uncovered Work is not found to be defective, Contractor shall be allowed an increase in the Contract Price or an extension of the Contract Times, or both, directly attributable to such uncovering, exposure, observation, inspection, testing, replacement, and reconstruction. If the parties are unable to agree as to the amount or extent thereof, Contractor may make a Claim therefor as provided in Paragraph 10.05.

13.05 *Owner May Stop the Work*

A. If the Work is defective, or Contractor fails to supply sufficient skilled workers or suitable materials or equipment, or fails to perform the Work in such a way that the completed Work will conform to the Contract Documents, Owner may order Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, this right of Owner to stop the Work shall not give rise to any duty on the part of Owner to exercise this right for the benefit of Contractor, any Subcontractor, any Supplier, any other individual or entity, or any surety for, or employee or agent of any of them.

13.06 *Correction or Removal of Defective Work*

A. Promptly after receipt of written notice, Contractor shall correct all defective Work, whether or not fabricated, installed, or completed, or, if the Work has been rejected by Engineer, remove it from the Project and replace it with Work that is not defective. Contractor shall pay all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or removal (including but not limited to all costs of repair or replacement of work of others).

B. When correcting defective Work under the terms of this Paragraph 13.06 or Paragraph 13.07, Contractor shall take no action that would void or otherwise impair Owner's special warranty and guarantee, if any, on said Work.

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13.07 *Correction Period*

A. If within one year after the date of Substantial Completion (or such longer period of time as may be prescribed by the terms of any applicable special guarantee required by the Contract Documents) or by any specific provision of the Contract Documents, any Work is found to be defective, or if the repair of any damages to the land or areas made available for Contractor's use by Owner or permitted by Laws and Regulations as contemplated in Paragraph 6.11.A is found to be defective, Contractor shall promptly, without cost to Owner and in accordance with Owner's written instructions:

1. repair such defective land or areas; or

2. correct such defective Work; or

3. if the defective Work has been rejected by Owner, remove it from the Project and replace it with Work that is not defective, and

4. satisfactorily correct or repair or remove and replace any damage to other Work, to the work of others or other land or areas resulting therefrom.

B. If Contractor does not promptly comply with the terms of Owner's written instructions, or in an emergency where delay would cause serious risk of loss or damage, Owner may have the defective Work corrected or repaired or may have the rejected Work removed and replaced. All claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or repair or such removal and replacement (including but not limited to all costs of repair or replacement of work of others) will be paid by Contractor and may be deducted from amounts otherwise due the Contractor.

C. In special circumstances where a particular item of equipment is placed in continuous service before Substantial Completion of all the Work, the correction period for that item may start to run from an earlier date if so provided in the Specifications.

D. Where defective Work (and damage to other Work resulting therefrom) has been corrected or removed and replaced under this Paragraph 13.07, the correction period hereunder with respect to such Work will be extended for an additional period of one year after such correction or removal and replacement has been satisfactorily completed and the terms of this Paragraph 13.07 will continue to apply.

E. Contractor's obligations under this Paragraph 13.07 are in addition to any other obligation or warranty. The provisions of this Paragraph 13.07 shall not be construed as a substitute for, or a waiver of, the provisions of any applicable statute of limitation or repose.

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13.08 *Acceptance of Defective Work*

A. If, instead of requiring correction or removal and replacement of defective Work, Owner (and, prior to Engineer's recommendation of final payment, Engineer) prefers to accept it, Owner may do so. Contractor shall pay all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) attributable to Owner's evaluation of and determination to accept such defective Work (such costs to be approved by Engineer as to reasonableness) and for the diminished value of the Work to the extent not otherwise paid by Contractor pursuant to this sentence. If any such acceptance occurs prior to Engineer's recommendation of final payment, a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work, and Owner shall be entitled to an appropriate decrease in the Contract Price, reflecting the diminished value of Work so accepted. If the parties are unable to agree as to the amount thereof, Owner may make a Claim therefor as provided in Paragraph 10.05. If the acceptance occurs after such recommendation, an appropriate amount will be paid by Contractor to Owner.

13.09 *Owner May Correct Defective Work*

A. If Contractor fails within a reasonable time after written notice from Engineer to correct defective Work, or to remove and replace rejected Work as required by Engineer in accordance with Paragraph 13.06.A, or if Contractor fails to perform the Work in accordance with the Contract Documents, or if Contractor fails to comply with any other provision of the Contract Documents, Owner may, after seven days written notice to Contractor, or immediately in the case of an emergency, correct, or remedy any such deficiency.

B. In exercising the rights and remedies under this Paragraph 13.09, Owner shall proceed expeditiously. In connection with such corrective or remedial action, Owner may exclude Contractor from all or part of the Site, take possession of all or part of the Work and suspend Contractor's services related thereto, take possession of Contractor's tools, appliances, construction equipment and machinery at the Site, and incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere. Contractor shall allow Owner, Owner's representatives, agents and employees, Owner's other contractors, and Engineer and Engineer's consultants access to the Site to enable Owner to exercise the rights and remedies under this Paragraph.

C. All claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) incurred or sustained by Owner in exercising the rights and remedies under this Paragraph 13.09 will be charged against Contractor, and a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work; and Owner shall be entitled to an appropriate decrease in the Contract Price. If the parties are unable to agree as to the amount of the adjustment, Owner may make a Claim therefor as provided in Paragraph 10.05. Such claims, costs, losses and damages will include but not be limited to all costs of repair, or replacement of work of others destroyed or damaged by correction, removal, or replacement of Contractor's defective Work.

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D. Contractor shall not be allowed an extension of the Contract Times because of any delay in the performance of the Work attributable to the exercise by Owner of Owner's rights and remedies under this Paragraph 13.09.

ARTICLE 14 – PAYMENTS TO CONTRACTOR AND COMPLETION

14.01 *Schedule of Values*

A. The Schedule of Values established as provided in Paragraph 2.07.A will serve as the basis for progress payments and will be incorporated into a form of Application for Payment acceptable to Engineer. Progress payments on account of Unit Price Work will be based on the number of units completed.

14.02 *Progress Payments*

A. Applications for Payments:

1. At least 20 days before the date established in the Agreement for each progress payment (but not more often than once a month), Contractor shall submit to Engineer for review an Application for Payment filled out and signed by Contractor covering the Work completed as of the date of the Application and accompanied by such supporting documentation as is required by the Contract Documents. If payment is requested on the basis of materials and equipment not incorporated in the Work but delivered and suitably stored at the Site or at another location agreed to in writing, the Application for Payment shall also be accompanied by a bill of sale, invoice, or other documentation warranting that Owner has received the materials and equipment free and clear of all Liens and evidence that the materials and equipment are covered by appropriate property insurance or other arrangements to protect Owner's interest therein, all of which must be satisfactory to Owner.

2. Beginning with the second Application for Payment, each Application shall include an affidavit of Contractor stating that all previous progress payments received on account of the Work have been applied on account to discharge Contractor's legitimate obligations associated with prior Applications for Payment.

3. The amount of retainage with respect to progress payments will be as stipulated in the Agreement.

B. Review of Applications:

1. Engineer will, within 10 days after receipt of each Application for Payment, either indicate in writing a recommendation of payment and present the Application to Owner or return the Application to Contractor indicating in writing Engineer's reasons for refusing to recommend payment. In the latter case, Contractor may make the necessary corrections and resubmit the Application.

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2. Engineer's recommendation of any payment requested in an Application for Payment will constitute a representation by Engineer to Owner, based on Engineer's observations of the executed Work as an experienced and qualified design professional, and on Engineer's review of the Application for Payment and the accompanying data and schedules, that to the best of Engineer's knowledge, information and belief:

    a. the Work has progressed to the point indicated;

    b. the quality of the Work is generally in accordance with the Contract Documents (subject to an evaluation of the Work as a functioning whole prior to or upon Substantial Completion, the results of any subsequent tests called for in the Contract Documents, a final determination of quantities and classifications for Unit Price Work under Paragraph 9.07, and any other qualifications stated in the recommendation); and

    c. the conditions precedent to Contractor's being entitled to such payment appear to have been fulfilled in so far as it is Engineer's responsibility to observe the Work.

3. By recommending any such payment Engineer will not thereby be deemed to have represented that:

    a. inspections made to check the quality or the quantity of the Work as it has been performed have been exhaustive, extended to every aspect of the Work in progress, or involved detailed inspections of the Work beyond the responsibilities specifically assigned to Engineer in the Contract Documents; or

    b. there may not be other matters or issues between the parties that might entitle Contractor to be paid additionally by Owner or entitle Owner to withhold payment to Contractor.

4. Neither Engineer's review of Contractor's Work for the purposes of recommending payments nor Engineer's recommendation of any payment, including final payment, will impose responsibility on Engineer:

    a. to supervise, direct, or control the Work, or

    b. for the means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or

    c. for Contractor's failure to comply with Laws and Regulations applicable to Contractor's performance of the Work, or

    d. to make any examination to ascertain how or for what purposes Contractor has used the moneys paid on account of the Contract Price, or

    e. to determine that title to any of the Work, materials, or equipment has passed to Owner free and clear of any Liens.

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5. Engineer may refuse to recommend the whole or any part of any payment if, in Engineer's opinion, it would be incorrect to make the representations to Owner stated in Paragraph 14.02.B.2. Engineer may also refuse to recommend any such payment or, because of subsequently discovered evidence or the results of subsequent inspections or tests, revise or revoke any such payment recommendation previously made, to such extent as may be necessary in Engineer's opinion to protect Owner from loss because:

    a. the Work is defective, or completed Work has been damaged, requiring correction or replacement;

    b. the Contract Price has been reduced by Change Orders;

    c. Owner has been required to correct defective Work or complete Work in accordance with Paragraph 13.09; or

    d. Engineer has actual knowledge of the occurrence of any of the events enumerated in Paragraph 15.02.A.

C. Payment Becomes Due:

1. Ten days after presentation of the Application for Payment to Owner with Engineer's recommendation, the amount recommended will (subject to the provisions of Paragraph 14.02.D) become due, and when due will be paid by Owner to Contractor.

D. Reduction in Payment:

1. Owner may refuse to make payment of the full amount recommended by Engineer because:

    a. claims have been made against Owner on account of Contractor's performance or furnishing of the Work;

    b. Liens have been filed in connection with the Work, except where Contractor has delivered a specific bond satisfactory to Owner to secure the satisfaction and discharge of such Liens and provides an indemnity satisfactory to Owner for all claims, costs, losses and damages arising out of such Liens;

    c. there are other items entitling Owner to a set-off against the amount recommended including liability for liquidated damages and correction of defective work by Owner or others; or

    d. Owner has actual knowledge of the occurrence of any of the events enumerated in Paragraphs 14.02.B.5.a through 14.02.B.5.c or Paragraph 15.02.A.

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2. If Owner refuses to make payment of the full amount recommended by Engineer, Owner will give Contractor immediate written notice (with a copy to Engineer) stating the reasons for such action and promptly pay Contractor any amount remaining after deduction of the amount so withheld. Owner shall promptly pay Contractor the amount so withheld, or any adjustment thereto agreed to by Owner and Contractor, when Contractor remedies the reasons for such action.

3. Upon a subsequent determination that Owner's refusal of payment was not justified, the amount wrongfully withheld shall be treated as an amount due as determined by Paragraph 14.02.C.1 and subject to interest as provided in the Agreement.

14.03 *Contractor's Warranty of Title*

A. Contractor warrants and guarantees that title to all Work, materials, and equipment covered by any Application for Payment, whether incorporated in the Project or not, will pass to Owner no later than the time of payment free and clear of all Liens.

14.04 *Substantial Completion*

A. When Contractor considers the entire Work ready for its intended use and final testing has been completed in accordance with the General Requirements, Contractor shall notify Owner and Engineer in writing that the entire Work is substantially complete (except for items specifically listed by Contractor in the Punchlist as incomplete) using the Notice of Substantial Completion form included in the Contract Documents, submit the Contractor's written general warranty and guarantee per Paragraph 6.19.D., and request that Engineer issue a certificate of Substantial Completion.

B. Promptly after Contractor's notification, Owner, Contractor, and Engineer shall make an inspection of the Work to determine the status of completion. If Engineer does not consider the Work substantially complete, Engineer will notify Contractor in writing giving the reasons therefor.

C. If Engineer considers the Work substantially complete, Engineer will deliver to Owner a tentative certificate of Substantial Completion which shall fix the date of Substantial Completion using the Certificate of Substantial Completion included in the Contract Documents. There shall be attached to the certificate a Punch List (tentative list of items to be completed or corrected before final payment). Owner shall have seven days after receipt of the tentative certificate during which to make written objection to Engineer as to any provisions of the certificate or attached list. If, after considering such objections, Engineer concludes that the Work is not substantially complete, Engineer will, within 14 days after submission of the tentative certificate to Owner, notify Contractor in writing, stating the reasons therefor. If, after consideration of Owner's objections, Engineer considers the Work substantially complete, Engineer will, within said 14 days, execute and deliver to Owner and Contractor a definitive certificate of Substantial Completion (with a revised Punch List (tentative list of items to be completed or corrected)) reflecting such changes from the tentative certificate as Engineer believes justified after consideration of any objections from Owner.

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D. At the time of delivery of the tentative certificate of Substantial Completion, Engineer will deliver to Owner and Contractor a written recommendation as to division of responsibilities pending final payment between Owner and Contractor with respect to security, operation, safety, and protection of the Work, maintenance, heat, utilities, insurance, and warranties and guarantees. Unless Owner and Contractor agree otherwise in writing and so inform Engineer in writing prior to Engineer's issuing the definitive certificate of Substantial Completion, Engineer's aforesaid recommendation will be binding on Owner and Contractor until final payment.

E. Owner shall have the right to exclude Contractor from the Site after the date of Substantial Completion subject to allowing Contractor reasonable access to remove its property and complete or correct items on the tentative list.

14.05 *Partial Utilization*

A. Prior to Substantial Completion of all the Work, Owner may use or occupy any substantially completed part of the Work which has specifically been identified in the Contract Documents, or which Owner, Engineer, and Contractor agree constitutes a separately functioning and usable part of the Work that can be used by Owner for its intended purpose without significant interference with Contractor's performance of the remainder of the Work, subject to the following conditions:

1. Owner at any time may request Contractor in writing to permit Owner to use or occupy any such part of the Work which Owner believes to be ready for its intended use and substantially complete. If and when Contractor agrees that such part of the Work is substantially complete, Contractor, Owner, and Engineer will follow the procedures of Paragraph 14.04.A through D for that part of the Work.

2. Contractor at any time may notify Owner and Engineer in writing that Contractor considers any such part of the Work ready for its intended use and substantially complete and request Engineer to issue a certificate of Substantial Completion for that part of the Work.

3. Within a reasonable time after either such request, Owner, Contractor, and Engineer shall make an inspection of that part of the Work to determine its status of completion. If Engineer does not consider that part of the Work to be substantially complete, Engineer will notify Owner and Contractor in writing giving the reasons therefor. If Engineer considers that part of the Work to be substantially complete, the provisions of Paragraph 14.04 will apply with respect to certification of Substantial Completion of that part of the Work and the division of responsibility in respect thereof and access thereto.

4. No use or occupancy or separate operation of part of the Work may occur prior to compliance with the requirements of Paragraph 5.10 regarding property insurance.

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14.06 *Final Inspection*

A. Upon written notice from Contractor that the entire Work or an agreed portion thereof is complete, Engineer will promptly make a final inspection with Owner and Contractor and will notify Contractor in writing of all particulars in which this inspection reveals that the Work is incomplete or defective. Contractor shall immediately take such measures as are necessary to complete such Work or remedy such deficiencies.

14.07 *Final Payment*

A. Application for Payment:

1. After Contractor has, in the opinion of Engineer, satisfactorily completed all corrections identified during the final inspection and has delivered, in accordance with the Contract Documents, all maintenance and operating instructions, schedules, guarantees, warranties, updated Contractor's written general warranty and guarantee per Paragraph 6.19.D if modified, bonds, certificates or other evidence of insurance, certificates of inspection, marked-up record documents (as provided in Paragraph 6.12), and other documents, and Engineer has indicated that the Work is acceptable (subject to the provisions of Paragraph 14.09), Contractor may make application for final payment following the procedure for progress payments.

2. The final Application for Payment shall be accompanied (except as previously delivered) by:

   a. all documentation called for in the Contract Documents, including but not limited to the evidence of insurance required by Paragraph 5.04.B.6;

   b. consent of the surety, if any, to final payment;

   c. a list of all Claims against Owner that Contractor believes are unsettled; and

   d. complete and legally effective releases or waivers (satisfactory to Owner) of all Lien rights arising out of or Liens filed in connection with the Work.

3. In lieu of the releases or waivers of Liens specified in Paragraph 14.07.A.2 and as approved by Owner, Contractor may furnish receipts or releases in full and an affidavit of Contractor that: (i) the releases and receipts include all labor, services, material, and equipment for which a Lien could be filed; and (ii) all payrolls, material and equipment bills, and other indebtedness connected with the Work for which Owner might in any way be responsible, or which might in any way result in liens or other burdens on Owner's property, have been paid or otherwise satisfied. If any Subcontractor or Supplier fails to furnish such a release or receipt in full, Contractor may furnish a bond or other collateral satisfactory to Owner to indemnify Owner against any Lien.

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B. Engineer's Review of Application and Acceptance:

1. If, on the basis of Engineer's observation of the Work during construction and final inspection, and Engineer's review of the final Application for Payment and accompanying documentation as required by the Contract Documents, Engineer is satisfied that the Work has been completed and Contractor's other obligations under the Contract Documents have been fulfilled, Engineer will, within ten days after receipt of the final Application for Payment, indicate in writing Engineer's recommendation of payment and present the Application for Payment to Owner for payment. At the same time Engineer will also give written notice to Owner and Contractor that the Work is acceptable using the Certificate of Completion form included in the Contract Documents, subject to the provisions of Paragraph 14.09. Otherwise, Engineer will return the Application for Payment to Contractor, indicating in writing the reasons for refusing to recommend final payment, in which case Contractor shall make the necessary corrections and resubmit the Application for Payment.

C. Payment Becomes Due:

1. Thirty days after the presentation to Owner of the Application for Payment and accompanying documentation, the amount recommended by Engineer, less any sum Owner is entitled to set off against Engineer's recommendation, including but not limited to liquidated damages, will become due and will be paid by Owner to Contractor.

14.08 *Final Completion Delayed*

A. If, through no fault of Contractor, final completion of the Work is significantly delayed, and if Engineer so confirms, Owner shall, upon receipt of Contractor's final Application for Payment (for Work fully completed and accepted) and recommendation of Engineer, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed and accepted as detailed on the Certificate of Completion. If the remaining balance to be held by Owner for Work not fully completed or corrected is less than the retainage stipulated in the Agreement, and if bonds have been furnished as required in Paragraph 5.01, the written consent of the surety to the payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by Contractor to Engineer with the Application for such payment. Such payment shall be made under the terms and conditions governing final payment, except that it shall not constitute a waiver of Claims.

14.09 *Waiver of Claims*

A. The making and acceptance of final payment will constitute:

1. a waiver of all Claims by Owner against Contractor, except Claims arising from unsettled Liens, from defective Work appearing after final inspection pursuant to Paragraph 14.06, from failure to comply with the Contract Documents or the terms of any special guarantees specified therein, or from Contractor's continuing obligations under the Contract Documents; and

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2. a waiver of all Claims by Contractor against Owner other than those previously made in accordance with the requirements herein and expressly acknowledged by Owner in writing as still unsettled.

ARTICLE 15 – SUSPENSION OF WORK AND TERMINATION

15.01 *Owner May Suspend Work*

A. At any time and without cause, Owner may suspend the Work or any portion thereof for a period of not more than 90 consecutive days by notice in writing to Contractor and Engineer which will fix the date on which Work will be resumed. Contractor shall resume the Work on the date so fixed. Contractor shall be granted an adjustment in the Contract Price or an extension of the Contract Times, or both, directly attributable to any such suspension if Contractor makes a Claim therefor as provided in Paragraph 10.05.

15.02 *Owner May Terminate for Cause*

A. The occurrence of any one or more of the following events will justify termination for cause:

1. Contractor's ~~persistent~~ failure to perform the Work in accordance with the Contract Documents (including, but not limited to, failure to supply sufficient skilled workers or suitable materials or equipment or failure to adhere to the Progress Schedule established under Paragraph 2.07 as adjusted from time to time pursuant to Paragraph 6.04);

2. Contractor's disregard of Laws or Regulations of any public body having jurisdiction;

3. Contractor's repeated disregard of the authority of Engineer; or

4. Contractor's violation in any substantial way of any provisions of the Contract Documents; or~~.~~

5. Contractor commences a voluntary case under any chapter of the Bankruptcy Code (Title 11, United States Code), as now or hereafter in effect, or if Contractor takes any equivalent or similar action by filing a petition or otherwise under any Laws and Regulations in effect at such time relating to the bankruptcy or insolvency; or

6. a petition is filed against Contractor under any chapter of the Bankruptcy Code as now or hereafter in effect at the time of filing, or if a petition is filed seeking any such equivalent or similar relief against Contractor under any Laws and Regulations in effect at the time relating to bankruptcy or insolvency; or

7. Contractor makes a general assignment for the benefit of creditors; or

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8. a trustee, receiver, custodian or agent of Contractor is appointed under applicable law or under contract, whose appointment or authority to take charge of property of Contractor is for the purpose of enforcing a Lien against such property or for the purpose of general administration of such property for the benefit of Contractor's creditors; or

9. Contractor admits in writing its inability to pay its debts generally as they become due.

B. If one or more of the events identified in Paragraph 15.02.A occur, Owner may, after giving Contractor (and surety) seven days written notice of its intent to terminate the services of Contractor:

1. exclude Contractor from the Site, and take possession of the Work and of all Contractor's tools, appliances, construction equipment, and machinery at the Site, and use the same to the full extent they could be used by Contractor (without liability to Contractor for trespass or conversion);

2. incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere; and

3. complete the Work as Owner may deem expedient.

C. If Owner proceeds as provided in Paragraph 15.02.B, Contractor shall not be entitled to receive any further payment until the Work is completed. If the unpaid balance of the Contract Price exceeds all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by Owner arising out of or relating to completing the Work, such excess will be paid to Contractor. If such claims, costs, losses, and damages exceed such unpaid balance, Contractor shall pay the difference to Owner. Such claims, costs, losses, and damages incurred by Owner will be reviewed by Engineer as to their reasonableness and, when so approved by Engineer, incorporated in a Change Order. When exercising any rights or remedies under this Paragraph, Owner shall not be required to obtain the lowest price for the Work performed.

D. Notwithstanding Paragraphs 15.02.B and 15.02.C, Contractor's services will not be terminated if Contractor begins within seven days of receipt of notice of intent to terminate to correct its failure to perform and proceeds diligently to cure such failure within no more than 30 days of receipt of said notice.

E. Where Contractor's services have been so terminated by Owner, the termination will not affect any rights or remedies of Owner against Contractor then existing or which may thereafter accrue. Any retention or payment of moneys due Contractor by Owner will not release Contractor from liability.

F. If and to the extent that Contractor has provided a performance bond under the provisions of Paragraph 5.01.A, the termination procedures of that bond shall supersede the provisions of Paragraphs 15.02.B and 15.02.C.

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15.03 *Owner May Terminate For Convenience*

A. Upon seven days written notice to Contractor and Engineer, Owner may, without cause and without prejudice to any other right or remedy of Owner, terminate the Contract. In such case, Contractor shall be paid for (without duplication of any items):

1. completed and acceptable Work executed in accordance with the Contract Documents prior to the effective date of termination, including fair and reasonable sums for overhead and profit on such Work;

2. expenses sustained prior to the effective date of termination in performing services and furnishing labor, materials, or equipment as required by the Contract Documents in connection with uncompleted Work, plus fair and reasonable sums for overhead and profit on such expenses;

3. all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) incurred in settlement of terminated contracts with Subcontractors, Suppliers, and others; and

4. reasonable expenses directly attributable to termination.

B. Contractor shall not be paid on account of loss of anticipated profits or revenue or other economic loss arising out of or resulting from such termination.

15.04 *Contractor May Stop Work or Terminate*

A. If, through no act or fault of Contractor, (i) the Work is suspended for more than 90 consecutive days by Owner or under an order of court or other public authority, or (ii) Engineer fails to act on any Application for Payment within 30 days after it is submitted, or (iii) Owner fails for 30 days to pay Contractor any sum finally determined to be due, then Contractor may, upon seven days written notice to Owner and Engineer, and provided Owner or Engineer do not remedy such suspension or failure within that time, terminate the Contract and recover from Owner payment on the same terms as provided in Paragraph 15.03.

B. In lieu of terminating the Contract and without prejudice to any other right or remedy, if Engineer has failed to act on an Application for Payment within 30 days after it is submitted, or Owner has failed for 30 days to pay Contractor any sum finally determined to be due, Contractor may, seven days after written notice to Owner and Engineer, stop the Work until payment is made of all such amounts due Contractor, including interest thereon. The provisions of this Paragraph 15.04 are not intended to preclude Contractor from making a Claim under Paragraph 10.05 for an adjustment in Contract Price or Contract Times or otherwise for expenses or damage directly attributable to Contractor's stopping the Work as permitted by this Paragraph.

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ARTICLE 16 – DISPUTE RESOLUTION

16.01 *Methods and Procedures*

A. Either Owner or Contractor may request mediation of any Claim submitted to Engineer for a decision under Paragraph 10.05 before such decision becomes final and binding. The mediation will be governed by the Construction Industry Mediation Rules of the American Arbitration Association in effect as of the Effective Date of the Agreement. The request for mediation shall be submitted in writing to the American Arbitration Association and the other party to the Contract. Timely submission of the request shall stay the effect of Paragraph 10.05.E.

B. Owner and Contractor shall participate in the mediation process in good faith. The process shall be concluded within 60 days of filing of the request. The date of termination of the mediation shall be determined by application of the mediation rules referenced above.

C. If the Claim is not resolved by mediation, Engineer's action under Paragraph 10.05.C or a denial pursuant to Paragraphs 10.05.C.3 or 10.05.D shall become final and binding 30 days after termination of the mediation unless, within that time period, Owner or Contractor:

1. elects in writing to invoke any dispute resolution process provided for in the Supplementary Conditions; or

2. agrees with the other party to submit the Claim to another dispute resolution process.~~; or~~

3. gives written notice to the other party of the intent to submit the Claim to a court of competent jurisdiction.

ARTICLE 17 – MISCELLANEOUS

17.01 *Giving Notice*

A. Whenever any provision of the Contract Documents requires the giving of written notice, it will be deemed to have been validly given if:

1. delivered in person to the individual or to a member of the firm or to an officer of the corporation for whom it is intended; or

2. delivered at or sent by registered or certified mail, postage prepaid, to the last business address known to the giver of the notice.

17.02 *Computation of Times*

A. When any period of time is referred to in the Contract Documents by days, it will be computed to exclude the first and include the last day of such period. If the last day of any such period falls on a Saturday or Sunday or on a day made a legal holiday by the law of the applicable jurisdiction, such day will be omitted from the computation.

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17.03 *Cumulative Remedies*

A. The duties and obligations imposed by these General Conditions and the rights and remedies available hereunder to the parties hereto are in addition to, and are not to be construed in any way as a limitation of, any rights and remedies available to any or all of them which are otherwise imposed or available by Laws or Regulations, by special warranty or guarantee, or by other provisions of the Contract Documents. The provisions of this Paragraph will be as effective as if repeated specifically in the Contract Documents in connection with each particular duty, obligation, right, and remedy to which they apply.

17.04 *Survival of Obligations*

A. All representations, indemnifications, warranties, and guarantees made in, required by, or given in accordance with the Contract Documents, as well as all continuing obligations indicated in the Contract Documents, will survive final payment, completion, and acceptance of the Work or termination or completion of the Contract or termination of the services of Contractor.

17.05 *Controlling Law*

A. This Contract is to be governed by the law of the state in which the Project is located.

17.06 *Headings*

A. Article and paragraph headings are inserted for convenience only and do not constitute parts of these General Conditions.

END OF SECTION

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SECTION 00 73 10

GENERAL SUPPLEMENTARY CONDITIONS

These Supplementary Conditions amend or supplement the Standard General Conditions of the Construction Contract, EJCDC® C-700 (2007 Edition) included in Section 00 72 05. Provisions not so amended or supplemented remain in full force and effect unless amended or supplemented in another section. The terms used in this section have the meanings stated in the General Conditions. Additional terms used in this section, if any, have the meanings stated below which are applicable to both the singular and plural thereof. The address system used herein is the same as the address system used in the General Conditions, with the prefix "SC" added thereto.

This section may include certain provisions required by Laws and Regulations, but does not represent or reflect all applicable provisions and policies or Laws and Regulations, and may only include excerpts and portions thereof. Other required provisions and policies, and Laws and Regulations, shall be deemed to be so included and incorporated herein. Contractor is solely responsible to determine, obtain, review and interpret the full text of applicable provisions and policies, Regulations, and Laws.

SC-1.01 *Defined Terms*

Add the following to A.15 *Contractor*:

> Also referred to as "General Contractor" or "general Contractor" in applicable statutory provisions which may be used interchangeably and shall have the same meaning.

Add the following to A.29. *Owner*:

> Also referred to as "Awarding Authority", "awarding authority", "Contracting Authority" or "contracting authority" in applicable statutory provisions which may be used interchangeably and shall have the same meaning.

Add the following new definitions to Paragraph 1.01.B.

6. *Installer* -- The entity engaged by Contractor or a Subcontractor for installation, erection, application and similar required operations of a particular portion of the Work at the Site, including who has specialty experience in the Work they are engaged to perform.

7. *material or Material* -- shall include "any article, assembly, system, included in the Work, or any component part thereof" regarding items equal to those specified in accordance with statutory requirements.

SC-2.01 ***Delivery of Bonds and Evidence of Insurance***

Replace Paragraph 2.01.B. with the following:

B. Before any Work at the Site is started, Contractor shall deliver to Owner, with copies to each additional insured identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance which Owner or any additional insured may reasonably request) which Contractor is required to purchase and maintain in accordance with Article 5.

SC-2.03 ***Commencement of Contract Times; Notice to Proceed***

In Paragraph 2.03.A., delete the last sentence in its entirety.

SC-2.05 ***Before Starting Construction***

Pursuant to subparagraph 2.05.A.1 regarding Progress Schedule, do not include weekends in Work hours.

Pursuant to subparagraph 2.05.A.3 regarding the Schedule of Values, the prices in the Bid Form will constitute the minimum items for the preliminary Schedule of Values for this Project.
Add the following immediately after Paragraph 2.05.B.

C. Additionally, within 10 days after the Effective Date of the Agreement, Contractor shall submit a Construction Operations Plan incorporating the schedules submitted pursuant to Paragraph 2.05.A and covering the following.

1. Construction methods and sequence of operations

2. Proposed Site access

3. Proposed erosion control measures and proposed measures to minimize impacts to existing vegetation and impacts to water quality in compliance with the General Requirements.

SC-2.07 ***Initial Acceptance of Schedules***

Add the following immediately after subparagraph 2.07.A.4.

5. Contractor’s Construction Operations Plan submitted pursuant to Paragraph 2.05.C. will be acceptable to Engineer if it accurately and reasonably addresses all aspects of the Work.

SC-3.02 ***Reference Standards***

In subparagraph 3.02.A.1., replace the phrase "in effect at the time of opening of Bids (or on the Effective Date of the Agreement if there were no Bids)," with:

"in effect and applicable at the time in question,"

SC 4.01 ***Availability of Lands***

In Paragraph 4.01.A., delete the last sentence in its entirety.
Delete Paragraph 4.01.B. in its entirety.

Pursuant to Paragraph 4.01.A, no easements and rights-of-way exist for the Project.

SC-4.02 ***Subsurface and Physical Conditions***

A. Pursuant to Paragraph 4.02.A,

1. the following reports of explorations and tests of subsurface conditions at or contiguous to the Site are known to Owner:

   a. Soil Boring Logs dated January 2021 prepared by New England Geotech, Inc., consisting of 31 pages.

      The "technical data" contained in such report upon which Contractor may rely is provided in the boring logs. The "technical data" shall be limited to facts, measurements, field observations, boring logs, soil type and similar data. "Technical data" shall not include opinions regarding suitability of material, dewatering methodologies, soil stability, slope stabilization methods and other opinions or professional judgments.

2. The following drawings of physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities) are known to Owner:

   a. NONE

3. The soil boring logs identified above are not part of the Contract Documents, but the "technical data" contained therein upon which Contractor may rely, as expressly identified and established above, are incorporated in the Contract Documents by reference and may be reflected in the Drawings. Contractor is not entitled to rely upon any other information and data known to or identified by Owner or Engineer.

4. Copies of the soil boring logs identified above are included in 00 31 00.

SC-4.03 ***Differing Subsurface or Physical Conditions***

Delete subparagraph 4.03.C.3. in its entirety.

SC-4.04 ***Underground Facilities***

In subparagraph 4.04.B.2., delete the last sentence in its entirety.

SC 4.05 ***Reference Points***

Pursuant to Paragraph 4.05.A, surveys exist for the Project and are reflected on the Drawings.

SC-4.06 ***Hazardous Environmental Conditions at Site***

A. Pursuant to Paragraph 4.06.A,

1. the following reports regarding Hazardous Environmental Conditions at the Site are known to Owner:

   a. NONE

2. The following drawings regarding Hazardous Environmental Conditions at the Site are known to Owner:

   a. NONE

Insert the following at the beginning of Paragraph 4.06.D.

> Except for removal and disposal of contaminated soils and water encountered during normal excavation and dewatering activities within Contractor's scope of Work and specified in Section 02 61 05,

In Paragraph 4.06.D., delete the last sentence in its entirety.

Insert the following language at the beginning of Paragraph 4.06.E.

> Except for removal and disposal of contaminated soils and water encountered during normal excavation and dewatering activities within Contractor's scope of Work and specified in Section 02 61 05,

In Paragraph 4.06.E., delete the last sentence in its entirety.
In Paragraph 4.06.F., delete the second sentence in its entirety.
In Paragraph 4.06.G., replace the language in its entirety with "(Not used)".
In Paragraph 4.06.H., delete the last sentence in its entirety.

SC-5.03 ***Certificates of Insurance***

In Paragraph 5.03.B., replace the language in its entirety with "(Not used)".

SC-5.04 ***Contractor's Insurance***

Pursuant to Paragraph 5.04.A, in addition to the individuals and entities specified in subparagraph 5.04.B.1, include the following as loss payees.

NONE

In subparagraph 5.04.B.4. line 2, delete the words "materially changed" per Massachusetts insurance Laws.

In Paragraph 5.04.B., add the following new subparagraph.

7. All coverage shall be written on an occurrence basis.

In subparagraph 5.04.B.1., line 1, replace "5.04.A.6 inclusive" with "5.04.A.7 inclusive".

Pursuant to subparagraph 5.04.C.5, also provide Owner's Protective Liability in the amount of $3,000,000 general aggregate ($1,000,000 per occurrence for bodily injury & property damage).

SC-5.06 ***Property Insurance***

In Paragraph C. line 3, delete the words "or materially changed" per Massachusetts insurance Laws.

Replace Paragraph 5.06.D. in its entirety, with the following.

D. The risk of loss within any identified deductible amount will be borne by Contractor, Subcontractors, or others suffering any such loss.

SC-5.07 ***Waiver of Rights***

In Paragraph 5.07.A., delete the second, third, and fourth sentences in their entirety.
Delete Paragraphs 5.07.B. and 5.07.C. in their entirety.

SC-5.09 ***Acceptance of Bonds and Insurance; Option to Replace***

At the end of the Article heading, insert "(Not Used)" and delete Paragraph 5.09.A. in its entirety.

SC-5.10 ***Partial Utilization, Acknowledgment of Property Insurer***

In the Article heading, delete the words "Acknowledgment of Property Insurer", and replace Paragraph 5.10.A. in its entirety with the following.

A. Owner may occupy or use a portion of the Work prior to Substantial Completion.

SC-6.02 ***Labor; Working Hours***

Pursuant to Paragraph 6.02.B, regular working hours for this Project are 7:00AM to 3:30PM, Monday through Friday.

SC-6.05 ***Substitutes and "Or-Equals"***

In Paragraph 6.05.A., add the following language at the end of the Paragraph.

", and in accordance with MGL Chapter 30, Section 39M (b)"

SC-6.06 ***Concerning Subcontractors, Suppliers, and Others***

In Paragraph 6.06.F., add the following language at the beginning of the Paragraph.

"Except as required by and indicated in the Specifications and Contract Documents pursuant to MGL Chapter 149, Section 44F (if applicable to the Project),"

SC-6.07 ***Patent Fees and Royalties***

In Paragraph 6.07.A., delete the second sentence in its entirety.
In Paragraph 6.07.B., replace the language in its entirety with "(Not used)".

SC-6.08 ***Permits***

Add the following immediately after Paragraph 6.08.A.

B. Owner has not obtained any permits for the Project.

SC-6.09 ***Laws and Regulations***

In Paragraph 6.09.C., delete the last sentence in its entirety.

SC-6.10 ***Taxes***

Add the following new Paragraph after Paragraph 6.10.A.

B. Owner is exempt from payment of Commonwealth of Massachusetts sales taxes on building materials and supplies to be used in the Work.

1. The words "building materials and supplies" shall include all materials and supplies consumed, employed or expended in the construction, reconstruction, alteration, remodeling or repair of any building, structure, public highway, bridge, or other such public work, as well as such materials and supplies physically incorporated therein. Said words shall also include rental charges for construction vehicles, equipment and machinery rented specifically for use on the Project Site, or while being used exclusively for the transportation of materials for the Project.

2. Owner will furnish the required certificates of tax exemption to Contractor for use in the purchases of building materials and supplies.

SC-6.13 ***Safety and Protection***

Add the following immediately after Paragraph 6.13.B.

1. Contractor shall comply with the following minimum requirements and is solely responsible to determine, obtain, review and interpret the full text of applicable Laws and Regulations.

- Code of Federal Regulations, Chapter XVII-Occupational Safety and Health Administration (OSHA), Department of Labor, Title 29, Part 1926, Safety and Health Regulations for Construction
- Hazard Communication Standard 1910.1200 regulated by OSHA, including providing and maintaining Safety Data Sheets, labeling of hazardous substances, and providing required protective equipment and training and instruction to personnel on the Site including Owner and Engineer's personnel
- OSHA General Industry 1910.146: Permit Required Confined Space Entry
- ANSI/ASSE A10 series of safety construction standards including the "Manual of Accident Prevention In Construction" published by The Associated General Contractors of America
- AASHTO Guide on Occupational Safety on Highway Construction Projects, Subpart N, 1926.550, relating to protection of personnel and equipment under electric lines and construction equipment clearances at overhead electric lines especially during operations using large vehicles

2. Pursuant to *MGL Chapter 30, Section 39S*, all employees to be employed at the Work Site will have successfully completed a course in construction safety and health approved by the United States Occupational Safety and Health Administration that is at least 10 hours in duration at the time the employee begins Work, and who shall furnish documentation of successful completion of said course with the first certified payroll report for each employee. Any employee found on a Work Site subject to this section without documentation of successful completion of a course in construction safety and health approved by the United States Occupational Safety and Health Administration that is at least 10 hours in duration shall be subject to immediate removal.

3. Comply with State and Federal COVID-19 guidelines and procedures for the construction sector (as may be amended).

In Paragraph 6.13.E., fourth sentence, insert a period after the word "Contractor" and delete the remaining language in parenthesis in its entirety.

SC-7.01 ***Related Work at Site***

Pursuant to Paragraph 7.01, Owner has not and does not intend to separately contract for other work on the Project at the Site.

In subparagraph 7.01.A.1., delete the word "and" and insert a period. Delete subparagraph 7.01.A.2. in its entirety.

SC-7.02 ***Coordination***

At the end of the Article heading, insert "(Not Used)" and delete Paragraphs 7.02.A. and 7.02.B. in their entirety.

SC-8.07 ***Change Orders***

At the end of the Article heading, insert "(Not Used)" and delete Paragraph 8.07.A. in its entirety.

SC-9.03 ***Project Representative***

In Paragraph 9.03.A., delete the last sentence in its entirety.

Add the following new Paragraph.

B. The Resident Project Representative (RPR) will be Engineer's employee or agent at the Site, will act as directed by and under the supervision of Engineer, and will confer with Engineer regarding RPR's actions. RPR's dealings in matters pertaining to the Work in general shall be with Engineer and Contractor. RPR's dealings with Subcontractors shall be through or with the full knowledge and approval of Contractor. The RPR shall:

1. *Schedules:* Review the Progress Schedule, schedule of Shop Drawing and Samples submittals, and Schedule of Values prepared by Contractor and consult with Engineer concerning acceptability.

2. *Conferences and Meetings:* Attend meetings with Contractor, such as preconstruction conferences, progress meetings, job conferences and other Project-related meetings, and prepare and circulate copies of minutes thereof.

3. *Liaison*:

    a. Serve as Engineer’s liaison with Contractor, working principally through Contractor’s authorized representative, to assist in providing information regarding the intent of the Contract Documents.

    b. Assist Engineer in serving as Owner’s liaison with Contractor when Contractor’s operations affect Owner’s on-Site operations.

    c. Assist in obtaining from Owner additional details or information, when required for proper execution of the Work.

4. *Interpretation of Contract Documents:* Report to Engineer when clarifications and interpretations of the Contract Documents are needed and transmit to Contractor clarifications and interpretations as issued by Engineer.

5. *Shop Drawings and Samples:*

    a. Record date of receipt of Samples and approved Shop Drawings.

    b. Receive Samples which are furnished at the Site by Contractor, and notify Engineer of availability of Samples for examination.

6. *Modifications*:

    a. Consider and evaluate Contractor's suggestions for modifications in Drawings or Specifications and report such suggestions, together with RPR's recommendations, to Engineer.

    b. Transmit to Contractor in writing, decisions as issued by Engineer.

7. *Review of Work and Rejection of Defective Work:*

    a. Conduct on-Site observations of Contractor's Work in progress to assist Engineer in determining if the Work is in general proceeding in accordance with the Contract Documents.

    b. Report to Engineer whenever RPR believes that any part of Contractor's Work in progress will not produce a completed Project that conforms generally to the Contract Documents or will imperil the integrity of the design concept of the completed Project as a functioning whole as indicated in the Contract Documents, or has been damaged, or does not meet the requirements of any inspection, test or approval required to be made; and advise Engineer of that part of Work in progress that RPR believes should be corrected or rejected or should be uncovered for observation, or requires special testing, inspection or approval.

8. *Inspections, Tests, and System Startups*:

    a. Verify that tests, equipment, and systems start-ups and operating and maintenance training are conducted in the presence of appropriate Owner's personnel, and that Contractor maintains adequate records thereof.

    b. Observe, record, and report to Engineer appropriate details relative to the test procedures and systems start-ups.

9. *Records:*

    a. Record names, addresses, fax numbers, e-mail addresses, web site locations, and telephone numbers of Contractor, Subcontractors, and major Suppliers.

    b. Maintain records for use in preparing Project documentation.

10. *Reports:*

    a. Furnish periodic reports to Engineer as required of progress of the Work and of Contractor's compliance with the Progress Schedule and schedule of Shop Drawing and Sample submittals.

    b. Draft and recommend to Engineer proposed Change Orders, Work Change Directives, and Field Orders. Obtain backup material from Contractor.

c. Immediately notify Engineer of the occurrence of any Site accidents, emergencies, acts of God endangering the Work, damage to property by fire or other causes, or the discovery of any Hazardous Environmental Condition or conditions that may impede the compliant operation of existing facilities on Site.

11. *Payment Requests:* Review Applications for Payment with Contractor for compliance with the established procedure for their submission and forward with recommendations to Engineer, noting particularly the relationship of the payment requested to the Schedule of Values, Work completed, and materials and equipment delivered at the Site but not incorporated in the Work.

12. *Certificates, Operation and Maintenance Manuals:* During the course of the Work, verify that materials and equipment certificates, operation and maintenance manuals and other data required by the Specifications to be assembled and furnished by Contractor are applicable to the items actually installed and in accordance with the Contract Documents, and have these documents delivered to Engineer for review and forwarding to Owner prior to payment for that part of the Work.

13. *Completion:*

a. Participate in a Substantial Completion inspection, assist in the determination of Substantial Completion and the preparation of the Punch List (lists of items to be completed or corrected).

b. Participate in a final inspection in the company of Engineer, Owner, and Contractor and prepare a final Punch List (list of items to be completed and deficiencies to be remedied).

c. Observe whether all items on the final Punch List have been completed or corrected and make recommendations to Engineer concerning acceptance and issuance of the Notice of Acceptability of the Work.

B. The RPR shall not:

1. Authorize any deviation from the Contract Documents or substitution of materials or equipment, including “or-equal” items.

2. Exceed limitations of Engineer’s authority as set forth in the Contract Documents.

3. Undertake any of the responsibilities of Contractor, Subcontractors, Suppliers, or Contractor’s superintendent.

4. Advise on, issue directions relative to, or assume control over any aspect of the means, methods, techniques, sequences or procedures of Contractor's Work unless such advice or directions are specifically required by the Contract Documents.

5. Advise on, issue directions regarding, or assume control over safety practices, precautions, and programs in connection with the activities or operations of Owner or Contractor.

6. Participate in specialized field or laboratory tests or inspections conducted off-Site by others except as specifically authorized by Engineer.

7. Accept Shop Drawing or Sample submittals from anyone other than Contractor.

8. Authorize Owner to occupy the Project in whole or in part or determine operational protocol that may affect the compliant operation of existing facilities.

SC-9.04 ***Authorized Variations in Work***

In Paragraph 9.04.A, delete the last sentence in its entirety.

SC-9.08 ***Decisions on Requirements of Contract Documents and Acceptability of Work***

In Paragraph 9.08.C., insert a period after the word "Contractor" and delete the remaining language in its entirety.

SC-10.03 ***Execution of Change Orders***

At the end of subparagraph 10.03.A.1., insert the word "and".
At the end of subparagraph 10.03.A.2., delete the word "and".
Delete subparagraph 10.03.A.3. in its entirety.

SC-11.01 ***Cost of the Work***

In subparagraph 11.01.A.5., item a., replace the language in its entirety with "(Not used)"and in item b., replace the language in its entirety with "(Not used)".
Delete items d, e, f, g, and h in their entirety.

SC-11.02 ***Allowances***

At the end of the Article heading, insert "(Not Used)" and delete Paragraphs 11.02.A., B., C., and D. in their entirety.

SC-12.01 *Change of Contract Price*

In subparagraph 12.01.B.3., delete the words "(determined as provided in Paragraph 12.01.C.)" at the end of the sentence.

Add the following new subparagraphs immediately after subparagraph 12.01.B.3. as required by MGL Chapter 30, Section 38A *Price adjustment clause in contracts for road, bridge, water and sewer projects awarded.*

4. ***Monthly Price Adjustments for Certain Materials***: As required by Massachusetts Chapter 150 of the Acts of 2013, the following price adjustment clauses for fuel (both diesel and gasoline), liquid asphalt and Portland cement contained in cast-in-place concrete shall be applicable to the Project. The following Base Prices are established for the Project, based on period prices shown below as published by the Massachusetts Department of Transportation - Highway Division at

https://www.mass.gov/service-details/massdot-current-contract-price-adjustments

Liquid Asphalt - $587.50 per TON (November 2021)
Diesel - $2.880 per GALLON (November, 2021)
Gasoline - $2.818 per GALLON (November, 2021)
Portland Cement - $162.28 per TON (December, 2021)

a. **Monthly Price Adjustment for Hot Mix Asphalt (HMA) Mixtures**: This adjustment will provide for either additional compensation to the Contractor or repayment to the Owner, depending on an increase or decrease in the Period Price of Liquid Asphalt.

1) Base Price: The Base Price of liquid asphalt listed above is the fixed price determined at the time of Bid by the Owner by using the same method as for the determination of the Period Price detailed below.

2) Price Adjustment: The Price Adjustment will be based on the variance in price for the liquid asphalt component only from the Base Price to the Period Price. It shall not include transportation or other charges. This Price Adjustment will occur on a monthly basis.

3) Period Price: The Period Price for this Contract shall be the Liquid Asphalt Period Price, per Ton.

4) Applicability: The Price Adjustment applies only to the actual virgin liquid asphalt content in the mixture placed on the Project in accordance with the Contract Documents.

5) Payment/Credit of Price Adjustment: The Contract Price of the hot mix asphalt mixture will be paid under the respective items in the Contract. The price adjustment, as herein provided, upwards or downwards, will be made after the Work has been performed, using the monthly Period Price for the month during which the Work was performed. The Price Adjustment will be a separate payment item and processed by Change Order. It will be determined by multiplying the number of tons of hot mix asphalt mixtures placed within pay limits during each monthly period as shown on submitted certified weigh slips times the liquid asphalt content percentage times the variance in price between Base Price and Period Price of liquid asphalt. This Price Adjustment will be paid or credited if the variance from the Base Price is 5 percent or more for a monthly period. No further Price Adjustments will be processed after the Contract is finally complete, unless an extension of Contract Time is approved by the Owner.

b. **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 Period Price of Diesel Fuel or Gasoline.

1) Base Price: The Base Price of Diesel Fuel and Gasoline listed above is the fixed price determined at the time of Bid by the Owner by using the same method as for the determination of the Period Price detailed below.

2) Price Adjustment: The Price Adjustment will be based on fuel usage factors for various items of Work included. These factors will be multiplied by the quantities of Work completed in each item during each monthly period and further multiplied by the variance in price from the Base Price to the Period Price.

3) Period Price: The Period Price for this Contract shall be the current Diesel Period Price and Gasoline Period Price per Gallon.

4) Applicability: The fuel Price Adjustment will apply only to the following items of Work listed at the fuel factors shown.

ITEMS OF WORK COVERED (PER UNIT PRICES FORM)	FUEL FACTORS	
	DIESEL	GASOLINE
2A-2D; 9A-9D	0.28 Gallons per LF	0.14 Gallons per LF
3A – 3D; 4A-4F; 5A-5E 6A-6B; 7; 10A-10D	0.28 Gallons per EA	0.14 Gallons per EA
11C	2.51 Gallons per EA	1.30 Gallons per EA
12A; 12B; 19	0.29 Gallons per CY	0.15 Gallons per CY
13	0.39 Gallons per CY	0.18 Gallons per CY
14A; 14B	2.90 Gallons per TON	Does not Apply
15A	6.7 Gallons per EA	6.7 Gallons per EA
15B	3.8 Gallons per EA	3.8 Gallons per EA
15C	2.38 Gallons per EA	2.38 Gallons per EA
15D	0.19 Gallons per LF	0.19 Gallons per LF

5) Payment/Credit of Price Adjustment: The Price Adjustment will be a separate payment item and processed by Change Order. The price adjustment, as herein provided, upwards or downwards, will be made after the Work has been performed, using the monthly Period Price for the month during which the Work was performed.

a) The Price Adjustment will be a separate payment item. For all items except items 14A and 14B, the Price Adjustment will be determined by multiplying the number of units of each item of Work times the fuel factor for each item of Work times the variance in price between Base Price and Period Price of diesel or gasoline.

b) For items 14A and 14B, the Price Adjustment will be determined by multiplying the number TONS of Hot Mix Asphalt installed times the fuel factor for each item of Work times the variance in price between Base Price and Period Price of diesel or gasoline. The Contractor shall provide the Owner with weigh slips for all Hot Mix Asphalt installed.

c) This Price Adjustment will be paid or credited if the variance from the Base Price is 5 percent or more for a monthly period. No further Price Adjustments will be processed after the Contract is finally complete, unless an extension of Contract Time is approved by the Owner.

c. **Monthly Price Adjustment for Portland Cement Concrete Mixes**: This adjustment will provide for either additional compensation to the Contractor or repayment to the Owner, depending on an increase or decrease in the Period Price of Portland cement.

1) Base Price: The Base Price of Portland cement listed above is the fixed price determined at the time of Bid by the Owner by using the same method as for the determination of the Period Price detailed below.

2) Price Adjustment: The Price Adjustment will be based on the variance in price for the Portland cement component only from the Base Price to the Period Price. It shall not include transportation or other charges. This Price Adjustment will occur on a monthly basis.

3) Period Price: The Period Price for this Contract shall be the current Portland cement Period Price per Ton.

4) Applicability: The price adjustment applies only to the actual Portland cement content in the mix placed on the Project in accordance with the Contract Documents.

5) Payment/Credit of Price Adjustment: The Contract Price of the Portland cement content in the mix will be paid under the respective items in the Contract. The price adjustment, as herein provided, upwards or downwards, will be made after the Work has been performed, using the monthly Period Price for the month during which the Work was performed. The Price Adjustment will be a separate payment item and processed by Change Order. It will be determined by multiplying the number of cubic yards of Portland cement concrete placed during each monthly period times the

Portland cement content percentage times the variance in price between the Base Price and Period Price of Portland cement. This Price Adjustment will be paid or credited if the variance from the Base Price is 5 percent or more for a monthly period. No further Price Adjustments will be processed after the Contract is finally complete, unless an extension of Contract Time is approved by the Owner.

In subparagraph 12.01.C.1, delete the word "or". Delete subparagraph 12.01.C.2 in its entirety (including items a through f).

SC-12.03 ***Delays***

In Paragraph 12.03.B., replace the language in its entirety with "(Not used)".

Add the following new Paragraph 12.03.F.

F. In the event of delays caused by or within the control of the Owner, the Contractor's sole remedy shall be an extension of Contract Times. Notwithstanding anything to the contrary in the Contract Documents, Contractor shall not be eligible for any increase in the Contract Price on account of any delay in the Work, no matter by whom such delay is caused, and Contractor shall make no Claim for such an increase, whether such Claim is styled as a Claim for delay damages, acceleration of Work, loss of production, or otherwise, except as provided by MGL Chapter 30, Section 39O in the case of certain written orders by the Owner.

SC-13.01 ***Notice of Defects***

In Paragraph 13.01.A., replace "Prompt notice" with "Notice".

SC-13.04 ***Uncovering Work***

Delete Paragraph 13.04.D. in its entirety.

SC-13.08 ***Acceptance of Defective Work***

In Paragraph 13.08.A., delete the last sentence in its entirety.

SC-13.09 ***Owner May Correct Defective Work***

In Paragraph 13.09.C., delete the second sentence in its entirety.

SC-14.02 ***Progress Payments***

In subparagraph 14.02.A.1, replace the first phrase ("At least. . . once a month),") with the following.

> "On a monthly basis and in accordance with MGL Chapter 30, Section 39G or Section 39K as applicable,"

Replace subparagraph 14.02.A.3 in its entirety with the following.

> 3. Retainage shall be in accordance with MGL Chapter 30, Section 39G or Section 39K as applicable.

Replace Paragraph 14.02.C. in its entirety with the following.

> C. Payment shall be made in accordance with MGL Chapter 30, Section 39G or Section 39K as applicable. For the purposes of this Paragraph, "Owner" shall mean "Owner's approving authorities".

In subparagraph 14.02.D.2., delete the word "immediate" in line 2 and delete the word "promptly" in line 3.

Delete subparagraph 14.02.D.3. in its entirety.

SC-14.04 ***Substantial Completion***

In Paragraph 14.04.C.,

> Third sentence, replace the words "shall have seven days after receipt of" with "shall review" and replace "during which to" with "and".
> Fourth sentence, delete the words "within 14 days after submission of the tentative certificate to Owner," in their entirety.
> Fifth sentence, delete the words "within said 14 days," in their entirety.

SC-14.05 ***Partial Utilization***

At the end of Paragraph 14.05.A, delete the words ", subject to the following conditions:".
In subparagraph 14.05.A.1., replace the language in its entirety with "(Not used)".
In subparagraph 14.05.A.2., replace the language in its entirety with "(Not used)".
In subparagraph 14.05.A.3., delete the words "Within a reasonable time after either such request," in their entirety.

SC-14.07 ***Final Payment***

In subparagraph 14.07.B.1., line 5, delete the words "within ten days after receipt of the final Application for Payment,".

Replace subparagraph 14.07.C.1. in its entirety with the following.

1. Final payment shall be made in accordance with MGL Chapter 30, Section 39G or Section 39K as applicable. For the purposes of this Paragraph, "Owner" shall mean "Owner's approving authorities".

SC-14.09 ***Waiver of Claims***

In subparagraph 14.09.A.1., replace the language in its entirety with "(Not used)".

SC-15.01 ***Owner May Suspend Work***

Replace Paragraph 15.01.A in its entirety with the following.

A. Owner may suspend the Work or any portion thereof in accordance with MGL Chapter 30, Section 39O.

SC-15.03 ***Owner May Terminate For Convenience***

In subparagraph 15.03.A.1., replace "including fair and reasonable sums for overhead and profit on such Work" with the word "and".

In subparagraph 15.03.A.2., insert a period after the word "Work", and delete the words "plus fair and reasonable sums for overhead and profit on such expenses" in their entirety.

Delete subparagraphs 15.03.A.3. and 15.03.A.4. in their entirety.

SC-15.04 ***Contractor May Stop Work or Terminate***

In Paragraph 15.04.B., delete the last sentence in its entirety.

SC-16 DISPUTE RESOLUTION

After the Article heading, insert the words "(Not Used)".

Delete Paragraph 16.01 in its entirety.

END OF SECTION

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SECTION 00 73 43

WAGE RATE REQUIREMENTS

These Supplementary Conditions amend or supplement the Standard General Conditions of the Construction Contract, EJCDC® C-700 (2007 Edition) included in Section 00 72 05. All provisions that are not so amended or supplemented remain in full force and effect unless amended or supplemented in another Section. The terms used in these Supplementary Conditions have the meanings stated in the General Conditions. Additional terms used in these Supplementary Conditions have the meanings stated within the Sections listed below, if any, which are applicable to both the singular and plural thereof.

The content of this Section does not represent or reflect all applicable Laws and Regulations and may only include excerpts and portions of certain Laws and Regulations. Other provisions and policies, and Laws and Regulations, shall be deemed to be so included and incorporated herein. Contractor is solely responsible to determine, obtain, review and interpret the full text of applicable Laws and Regulations.

The Project is subject to prevailing wage rates as issued by the Director of the Executive Office of Labor and Workforce Development (EOLWD), Department of Labor Standards (DLS) and the requirements of MGL Chapter 149, Sections 26, 27 and 27A to 27H. Pursuant to MGL Chapter 149, Section 34B, wages paid to reserve police officers shall be the same prevailing rate of wage paid to regular police officers at the location of the Project.

Comply with requirements available on the Executive Office of Labor and Workforce Development website at https://www.mass.gov/prevailing-wage-program. See Guide to Contractors at https://www.mass.gov/files/2017-07/dls-pw-bro-for-contractors-6-12.pdf.

Submit required records and statements of compliance in accordance with MGL Chapter 149, Section 27B using the latest Weekly Payroll and Compliance forms available on the EOLWD website. Copies included in this section are for information only.

Wage determination schedules are included at the end of this section. In case of discrepancy between state wage rates and Federal wage rates, if any, the higher wage rates shall apply.

ATTACHMENTS

A. Massachusetts Prevailing Wage forms (samples)

B. Wage Determination Schedules

END OF SECTION

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WEEKLY PAYROLL RECORDS REPORT
& STATEMENT OF COMPLIANCE

In accordance with Massachusetts General Law c. 149, §27B, a true and accurate record must be kept of all persons employed on the public works project for which the enclosed rates have been provided. A Payroll Form is available from the Department of Labor Standards (DLS) at www.mass.gov/dols/pw and includes all the information required to be kept by law. Every contractor or subcontractor is required to keep these records and preserve them for a period of three years from the date of completion of the contract.

On a weekly basis, every contractor and subcontractor is required to submit a certified copy of their weekly payroll records to the awarding authority; this includes the payroll forms and the Statement of Compliance form. The certified payroll records must be submitted either by regular mail or by e-mail to the awarding authority. Once collected, the awarding authority is required to preserve those records for three years from the date of completion of the project.

Each such contractor and subcontractor shall furnish weekly **and** within 15 days after completion of its portion of the work, to the awarding authority directly by first-class mail or e-mail, a statement, executed by the contractor, subcontractor or by any authorized officer thereof who supervised the payment of wages, this form, accompanied by their payroll:

STATEMENT OF COMPLIANCE

_____, 20_____

I,_____,_____
(Name of signatory party) (Title)

do hereby state:

That I pay or supervise the payment of the persons employed by

_____ on the _____
(Contractor, subcontractor or public body) (Building or project)

and that all mechanics and apprentices, teamsters, chauffeurs and laborers employed on said project have been paid in accordance with wages determined under the provisions of sections twenty-six and twenty-seven of chapter one hundred and forty nine of the General Laws.

Signature _____

Title _____

MASSACHUSETTS WEEKLY CERTIFIED PAYROLL REPORT FORM

Company's Name:	Address:	Phone No.:	Payroll No.:

Employer's Signature:	Title:	Contract No:	Tax Payer ID Number	Work Week Ending:

Awarding Authority's Name:	Public Works Project Name:	Public Works Project Location:	Min. Wage Rate Sheet Number

General / Prime Contractor's Name:	Subcontractor's Name:		"Employer" Hourly Fringe Benefit Contributions

Employee Name & Complete Address	Work Classification:	Employee is OSHA 10 certified (?)	Appr. Rate (%)	Hours Worked Su.	Mo.	Tu.	We.	Th.	Fr.	Sa.	Project Hours (A) All Other Hours	Hourly Base Wage (B)	Health & Welfare Insurance (C)	ERISA Pension Plan (D)	Supp. Unemp. (E)	(B+C+D+E) Total Hourly Prev. Wage (F)	(A x F) Project Gross Wages Total Gross Wages	Check No. (H)

Are all apprentice employees identified above currently registered with the MA DLS's Division of Apprentice Standards? YES ☐ NO ☐

For all apprentices performing work during the reporting period, attach a copy of the apprentice identification card issued by the Massachusetts Department of Labor Standards / Division of Apprentice Standards. No apprentices are identified above ☐

NOTE: Pursuant to MGL c. 149, s. 27B, every contractor and subcontractor is required to submit a **true and accurate** copy of their certified weekly payroll records to the awarding authority by first-class mail or e-mail. In addition, each weekly payroll must be accompanied by a statement of compliance signed by the employer. Failure to comply may result in the commencement of a criminal action or the issuance of a civil citation.

Date Received by Awarding Authority
/ /

CHARLES D. BAKER
Governor

KARYN E. POLITO
Lt. Governor

THE COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF LABOR AND WORKFORCE DEVELOPMENT
DEPARTMENT OF LABOR STANDARDS

Prevailing Wage Rates

As determined by the Director under the provisions of the Massachusetts General Laws, Chapter 149, Sections 26 to 27H

ROSALIN ACOSTA
Secretary
MICHAEL FLANAGAN
Director

Awarding Authority: Plainville Water & Sewer Department

Contract Number: 0233560.00 **City/Town:** PLAINVILLE

Description of Work: Provide approximately 7,125 linear feet of 6-in. to 10-in. diameter ductile iron water main on Grove St, Pleasant St, Potter Ave, Lincoln Ave, Melcher St, and Witherell Pl.

Job Location: Grove St./Pleasant St. and various streets

Information about Prevailing Wage Schedules for Awarding Authorities and Contractors

- This wage schedule applies only to the specific project referenced at the top of this page and uniquely identified by the "Wage Request Number" on all pages of this schedule.
- An Awarding Authority must request an updated wage schedule from the Department of Labor Standards ("DLS") if it has not opened bids or selected a contractor within 90 days of the date of issuance of the wage schedule. For CM AT RISK projects (bid pursuant to G.L. c.149A), the earlier of: (a) the execution date of the GMP Amendment, or (b) the bid for the first construction scope of work must be within 90-days of the wage schedule issuance date.
- The wage schedule shall be incorporated in any advertisement or call for bids for the project as required by M.G.L. c. 149, § 27. The wage schedule shall be made a part of the contract awarded for the project. The wage schedule must be posted in a conspicuous place at the work site for the life of the project in accordance with M.G.L. c. 149 § 27. The wages listed on the wage schedule must be paid to employees performing construction work on the project whether they are employed by the prime contractor, a filed sub-bidder, or any sub-contractor.
- All apprentices working on the project are required to be registered with the Massachusetts Department of Labor Standards, Division of Apprentice Standards (DLS/DAS). Apprentice must keep his/her apprentice identification card on his/her person during all work hours on the project. An apprentice registered with DAS may be paid the lower apprentice wage rate at the applicable step as provided on the prevailing wage schedule. **Any apprentice not registered with DLS/DAS regardless of whether or not they are registered with any other federal, state, local, or private agency must be paid the journeyworker's rate for the trade.**
- The wage rates will remain in effect for the duration of the project, except in the case of multi-year public construction projects. For construction projects lasting longer than one year, awarding authorities must request an updated wage schedule. Awarding authorities are required to request these updates no later than two weeks before the anniversary of the date the contract was executed by the awarding authority and the general contractor. For multi-year CM AT RISK projects, awarding authority must request an annual update no later than two weeks before the anniversary date, determined as the earlier of: (a) the execution date of the GMP Amendment, or (b) the execution date of the first amendment to permit procurement of construction services. Contractors are required to obtain the wage schedules from awarding authorities, and to pay no less than these rates to covered workers. The annual update requirement is not applicable to 27F "rental of equipment" contracts.
- Every contractor or subcontractor which performs construction work on the project is required to submit weekly payroll reports and a Statement of Compliance directly to the awarding authority by mail or email and keep them on file for three years. Each weekly payroll report must contain: the employee's name, address, occupational classification, hours worked, and wages paid. Do not submit weekly payroll reports to DLS. A sample of a payroll reporting form may be obtained at http://www.mass.gov/dols/pw.
- Contractors with questions about the wage rates or classifications included on the wage schedule have an affirmative obligation to inquire with DLS at (617) 626-6953.
- Employees not receiving the prevailing wage rate set forth on the wage schedule may report the violation to the Fair Labor Division of the office of the Attorney General at (617) 727-3465.
- Failure of a contractor or subcontractor to pay the prevailing wage rates listed on the wage schedule to all employees who perform construction work on the project is a violation of the law and subjects the contractor or subcontractor to civil and criminal penalties.

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
Construction						
(2 AXLE) DRIVER - EQUIPMENT *TEAMSTERS JOINT COUNCIL NO. 10 ZONE B*	12/01/2021	$35.95	$13.41	$16.01	$0.00	$65.37
(3 AXLE) DRIVER - EQUIPMENT *TEAMSTERS JOINT COUNCIL NO. 10 ZONE B*	12/01/2021	$36.02	$13.41	$16.01	$0.00	$65.44
(4 & 5 AXLE) DRIVER - EQUIPMENT *TEAMSTERS JOINT COUNCIL NO. 10 ZONE B*	12/01/2021	$36.14	$13.41	$16.01	$0.00	$65.56
ADS/SUBMERSIBLE PILOT *PILE DRIVER LOCAL 56 (ZONE 1)*	08/01/2020	$103.05	$9.40	$23.12	$0.00	$135.57
For apprentice rates see "Apprentice- PILE DRIVER"						
AIR TRACK OPERATOR *LABORERS - ZONE 2*	12/01/2021	$36.16	$9.10	$16.64	$0.00	$61.90
	06/01/2022	$37.06	$9.10	$16.64	$0.00	$62.80
	12/01/2022	$37.91	$9.10	$16.64	$0.00	$63.65
	06/01/2023	$38.81	$9.10	$16.64	$0.00	$64.55
	12/01/2023	$39.71	$9.10	$16.64	$0.00	$65.45
For apprentice rates see "Apprentice- LABORER"						
AIR TRACK OPERATOR (HEAVY & HIGHWAY) *LABORERS - ZONE 2 (HEAVY & HIGHWAY)*	12/01/2021	$36.16	$9.10	$16.64	$0.00	$61.90
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
ASBESTOS WORKER (PIPES & TANKS) *HEAT & FROST INSULATORS LOCAL 6 (SOUTHERN MASS)*	12/01/2020	$38.10	$12.80	$9.45	$0.00	$60.35
ASPHALT RAKER *LABORERS - ZONE 2*	12/01/2021	$35.66	$9.10	$16.64	$0.00	$61.40
	06/01/2022	$36.56	$9.10	$16.64	$0.00	$62.30
	12/01/2022	$37.41	$9.10	$16.64	$0.00	$63.15
	06/01/2023	$38.31	$9.10	$16.64	$0.00	$64.05
	12/01/2023	$39.21	$9.10	$16.64	$0.00	$64.95
For apprentice rates see "Apprentice- LABORER"						
ASPHALT RAKER (HEAVY & HIGHWAY) *LABORERS - ZONE 2 (HEAVY & HIGHWAY)*	12/01/2021	$35.66	$9.10	$16.64	$0.00	$61.40
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
ASPHALT/CONCRETE/CRUSHER PLANT-ON SITE *OPERATING ENGINEERS LOCAL 4*	12/01/2021	$51.38	$14.00	$16.05	$0.00	$81.43
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
BACKHOE/FRONT-END LOADER *OPERATING ENGINEERS LOCAL 4*	12/01/2021	$51.38	$14.00	$16.05	$0.00	$81.43
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
BARCO-TYPE JUMPING TAMPER *LABORERS - ZONE 2*	12/01/2021	$35.66	$9.10	$16.64	$0.00	$61.40
	06/01/2022	$36.56	$9.10	$16.64	$0.00	$62.30
	12/01/2022	$37.41	$9.10	$16.64	$0.00	$63.15
	06/01/2023	$38.31	$9.10	$16.64	$0.00	$64.05
	12/01/2023	$39.21	$9.10	$16.64	$0.00	$64.95
For apprentice rates see "Apprentice- LABORER"						
BLOCK PAVER, RAMMER / CURB SETTER *LABORERS - ZONE 2*	12/01/2021	$36.16	$9.10	$16.64	$0.00	$61.90
	06/01/2022	$37.06	$9.10	$16.64	$0.00	$62.80
	12/01/2022	$37.91	$9.10	$16.64	$0.00	$63.65
	06/01/2023	$38.81	$9.10	$16.64	$0.00	$64.55
	12/01/2023	$39.71	$9.10	$16.64	$0.00	$65.45
For apprentice rates see "Apprentice- LABORER"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
BLOCK PAVER, RAMMER / CURB SETTER (HEAVY & HIGHWAY) *LABORERS - ZONE 2 (HEAVY & HIGHWAY)* For apprentice rates see "Apprentice- LABORER (Heavy and Highway)	12/01/2021	$36.16	$9.10	$16.64	$0.00	$61.90
BOILER MAKER *BOILERMAKERS LOCAL 29*	01/01/2020	$46.10	$7.07	$17.98	$0.00	$71.15

Apprentice - *BOILERMAKER - Local 29*

Effective Date - 01/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	65	$29.97	$7.07	$11.69	$0.00	$48.73
2	65	$29.97	$7.07	$11.69	$0.00	$48.73
3	70	$32.27	$7.07	$12.59	$0.00	$51.93
4	75	$34.58	$7.07	$13.49	$0.00	$55.14
5	80	$36.88	$7.07	$14.38	$0.00	$58.33
6	85	$39.19	$7.07	$15.29	$0.00	$61.55
7	90	$41.49	$7.07	$16.18	$0.00	$64.74
8	95	$43.80	$7.07	$17.09	$0.00	$67.96

Notes:

Apprentice to Journeyworker Ratio:1:4

BRICK/STONE/ARTIFICIAL MASONRY (INCL. MASONRY WATERPROOFING) *BRICKLAYERS LOCAL 3 (FOXBORO)*	08/01/2021	$55.01	$11.39	$21.57	$0.00	$87.97
	02/01/2022	$55.59	$11.39	$21.57	$0.00	$88.55

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *BRICK/PLASTER/CEMENT MASON - Local 3 Foxboro*

Effective Date - 08/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$27.51	$11.39	$21.57	$0.00	$60.47
2	60	$33.01	$11.39	$21.57	$0.00	$65.97
3	70	$38.51	$11.39	$21.57	$0.00	$71.47
4	80	$44.01	$11.39	$21.57	$0.00	$76.97
5	90	$49.51	$11.39	$21.57	$0.00	$82.47

Effective Date - 02/01/2022

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$27.80	$11.39	$21.57	$0.00	$60.76
2	60	$33.35	$11.39	$21.57	$0.00	$66.31
3	70	$38.91	$11.39	$21.57	$0.00	$71.87
4	80	$44.47	$11.39	$21.57	$0.00	$77.43
5	90	$50.03	$11.39	$21.57	$0.00	$82.99

Notes:

Apprentice to Journeyworker Ratio:1:5

BULLDOZER/GRADER/SCRAPER *OPERATING ENGINEERS LOCAL 4*	12/01/2021	$50.83	$14.00	$16.05	$0.00	$80.88
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
CAISSON & UNDERPINNING BOTTOM MAN *LABORERS - FOUNDATION AND MARINE*	12/01/2021	$42.33	$9.10	$17.72	$0.00	$69.15
For apprentice rates see "Apprentice- LABORER"						
CAISSON & UNDERPINNING LABORER *LABORERS - FOUNDATION AND MARINE*	12/01/2021	$41.18	$9.10	$17.72	$0.00	$68.00
For apprentice rates see "Apprentice- LABORER"						
CAISSON & UNDERPINNING TOP MAN *LABORERS - FOUNDATION AND MARINE*	12/01/2021	$41.18	$9.10	$17.72	$0.00	$68.00
For apprentice rates see "Apprentice- LABORER"						
CARBIDE CORE DRILL OPERATOR *LABORERS - ZONE 2*	12/01/2021	$35.66	$9.10	$16.64	$0.00	$61.40
	06/01/2022	$36.56	$9.10	$16.64	$0.00	$62.30
	12/01/2022	$37.41	$9.10	$16.64	$0.00	$63.15
	06/01/2023	$38.31	$9.10	$16.64	$0.00	$64.05
	12/01/2023	$39.21	$9.10	$16.64	$0.00	$64.95
For apprentice rates see "Apprentice- LABORER"						
CARPENTER *CARPENTERS -ZONE 2 (Eastern Massachusetts)*	09/01/2021	$44.18	$8.58	$19.82	$0.00	$72.58
	03/01/2022	$44.78	$8.58	$19.82	$0.00	$73.18
	09/01/2022	$45.43	$8.58	$19.82	$0.00	$73.83
	03/01/2023	$46.03	$8.58	$19.82	$0.00	$74.43

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *CARPENTER - Zone 2 Eastern MA*

Effective Date - 09/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$22.09	$8.58	$1.73	$0.00	$32.40
2	60	$26.51	$8.58	$1.73	$0.00	$36.82
3	70	$30.93	$8.58	$14.63	$0.00	$54.14
4	75	$33.14	$8.58	$14.63	$0.00	$56.35
5	80	$35.34	$8.58	$16.36	$0.00	$60.28
6	80	$35.34	$8.58	$16.36	$0.00	$60.28
7	90	$39.76	$8.58	$18.09	$0.00	$66.43
8	90	$39.76	$8.58	$18.09	$0.00	$66.43

Effective Date - 03/01/2022

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$22.39	$8.58	$1.73	$0.00	$32.70
2	60	$26.87	$8.58	$1.73	$0.00	$37.18
3	70	$31.35	$8.58	$14.63	$0.00	$54.56
4	75	$33.59	$8.58	$14.63	$0.00	$56.80
5	80	$35.82	$8.58	$16.36	$0.00	$60.76
6	80	$35.82	$8.58	$16.36	$0.00	$60.76
7	90	$40.30	$8.58	$18.09	$0.00	$66.97
8	90	$40.30	$8.58	$18.09	$0.00	$66.97

Notes:

% Indentured After 10/1/17; 45/45/55/55/70/70/80/80
Step 1&2 $30.19/ 3&4 $36.28/ 5&6 $55.87/ 7&8 $62.01

Apprentice to Journeyworker Ratio:1:5

CARPENTER WOOD FRAME *CARPENTERS-ZONE 3 (Wood Frame)*	04/01/2021	$23.16	$7.21	$4.80	$0.00	$35.17
	04/01/2022	$23.66	$7.21	$4.80	$0.00	$35.67
	04/01/2023	$24.16	$7.21	$4.80	$0.00	$36.17

All Aspects of New Wood Frame Work

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *CARPENTER (Wood Frame) - Zone 3*

Effective Date - 04/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	$13.90	$7.21	$0.00	$0.00	$21.11
2	60	$13.90	$7.21	$0.00	$0.00	$21.11
3	65	$15.05	$7.21	$0.00	$0.00	$22.26
4	70	$16.21	$7.21	$0.00	$0.00	$23.42
5	75	$17.37	$7.21	$3.80	$0.00	$28.38
6	80	$18.53	$7.21	$3.80	$0.00	$29.54
7	85	$19.69	$7.21	$3.80	$0.00	$30.70
8	90	$20.84	$7.21	$3.80	$0.00	$31.85

Effective Date - 04/01/2022

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	$14.20	$7.21	$0.00	$0.00	$21.41
2	60	$14.20	$7.21	$0.00	$0.00	$21.41
3	65	$15.38	$7.21	$0.00	$0.00	$22.59
4	70	$16.56	$7.21	$0.00	$0.00	$23.77
5	75	$17.75	$7.21	$3.80	$0.00	$28.76
6	80	$18.93	$7.21	$3.80	$0.00	$29.94
7	85	$20.11	$7.21	$3.80	$0.00	$31.12
8	90	$21.29	$7.21	$3.80	$0.00	$32.30

Notes:

% Indentured After 10/1/17; 45/45/55/55/70/70/80/80
Step 1&2 $17.63/ 3&4 $19.95/ 5&6 $27.22/ 7&8 $29.54

Apprentice to Journeyworker Ratio:1:5

CEMENT MASONRY/PLASTERING *BRICKLAYERS LOCAL 3 (FOXBORO)*	01/01/2020	$44.67	$12.75	$22.41	$0.62	$80.45

Apprentice - *CEMENT MASONRY/PLASTERING - Foxboro*

Effective Date - 01/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$22.34	$12.75	$15.41	$0.00	$50.50
2	60	$26.80	$12.75	$17.41	$0.62	$57.58
3	65	$29.04	$12.75	$18.41	$0.62	$60.82
4	70	$31.27	$12.75	$19.41	$0.62	$64.05
5	75	$33.50	$12.75	$20.41	$0.62	$67.28
6	80	$35.74	$12.75	$21.41	$0.62	$70.52
7	90	$40.20	$12.75	$22.41	$0.62	$75.98

Notes:

Steps 3,4 are 500 hrs. All other steps are 1,000 hrs.

Apprentice to Journeyworker Ratio:1:3

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
CHAIN SAW OPERATOR *LABORERS - ZONE 2*	12/01/2021	$35.66	$9.10	$16.64	$0.00	$61.40
	06/01/2022	$36.56	$9.10	$16.64	$0.00	$62.30
	12/01/2022	$37.41	$9.10	$16.64	$0.00	$63.15
	06/01/2023	$38.31	$9.10	$16.64	$0.00	$64.05
	12/01/2023	$39.21	$9.10	$16.64	$0.00	$64.95
For apprentice rates see "Apprentice- LABORER"						
CLAM SHELLS/SLURRY BUCKETS/HEADING MACHINES *OPERATING ENGINEERS LOCAL 4*	12/01/2021	$52.38	$14.00	$16.05	$0.00	$82.43
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
COMPRESSOR OPERATOR *OPERATING ENGINEERS LOCAL 4*	12/01/2021	$33.69	$14.00	$16.05	$0.00	$63.74
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
DELEADER (BRIDGE) *PAINTERS LOCAL 35 - ZONE 2*	07/01/2021	$52.86	$8.45	$22.90	$0.00	$84.21
	01/01/2022	$53.66	$8.65	$23.05	$0.00	$85.36
	07/01/2022	$54.86	$8.65	$23.05	$0.00	$86.56
	01/01/2023	$56.06	$8.65	$23.05	$0.00	$87.76
	07/01/2023	$57.26	$8.65	$23.05	$0.00	$88.96
	01/01/2024	$58.46	$8.65	$23.05	$0.00	$90.16
	07/01/2024	$59.66	$8.65	$23.05	$0.00	$91.36
	01/01/2025	$60.86	$8.65	$23.05	$0.00	$92.56

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *PAINTER Local 35 - BRIDGES/TANKS*

Effective Date - 07/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$26.43	$8.45	$0.00	$0.00	$34.88
2	55	$29.07	$8.45	$6.22	$0.00	$43.74
3	60	$31.72	$8.45	$6.78	$0.00	$46.95
4	65	$34.36	$8.45	$7.35	$0.00	$50.16
5	70	$37.00	$8.45	$19.51	$0.00	$64.96
6	75	$39.65	$8.45	$20.08	$0.00	$68.18
7	80	$42.29	$8.45	$20.64	$0.00	$71.38
8	90	$47.57	$8.45	$21.77	$0.00	$77.79

Effective Date - 01/01/2022

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$26.83	$8.65	$0.00	$0.00	$35.48
2	55	$29.51	$8.65	$6.27	$0.00	$44.43
3	60	$32.20	$8.65	$6.84	$0.00	$47.69
4	65	$34.88	$8.65	$7.41	$0.00	$50.94
5	70	$37.56	$8.65	$19.63	$0.00	$65.84
6	75	$40.25	$8.65	$20.20	$0.00	$69.10
7	80	$42.93	$8.65	$20.77	$0.00	$72.35
8	90	$48.29	$8.65	$21.91	$0.00	$78.85

Notes:
Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

DEMO: ADZEMAN *LABORERS - ZONE 2*	12/01/2021	$41.33	$9.10	$17.57	$0.00	$68.00
	06/01/2022	$42.33	$9.10	$17.57	$0.00	$69.00
	12/01/2022	$43.33	$9.10	$17.57	$0.00	$70.00
	06/01/2023	$44.33	$9.10	$17.57	$0.00	$71.00
	12/01/2023	$45.58	$9.10	$17.57	$0.00	$72.25
For apprentice rates see "Apprentice- LABORER"						
DEMO: BACKHOE/LOADER/HAMMER OPERATOR *LABORERS - ZONE 2*	12/01/2021	$42.33	$9.10	$17.57	$0.00	$69.00
	06/01/2022	$43.33	$9.10	$17.57	$0.00	$70.00
	12/01/2022	$44.33	$9.10	$17.57	$0.00	$71.00
	06/01/2023	$45.33	$9.10	$17.57	$0.00	$72.00
	12/01/2023	$46.58	$9.10	$17.57	$0.00	$73.25
For apprentice rates see "Apprentice- LABORER"						
DEMO: BURNERS *LABORERS - ZONE 2*	12/01/2021	$42.08	$9.10	$17.57	$0.00	$68.75
	06/01/2022	$43.08	$9.10	$17.57	$0.00	$69.75
	12/01/2022	$44.08	$9.10	$17.57	$0.00	$70.75
	06/01/2023	$45.08	$9.10	$17.57	$0.00	$71.75
	12/01/2023	$46.33	$9.10	$17.57	$0.00	$73.00
For apprentice rates see "Apprentice- LABORER"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
DEMO: CONCRETE CUTTER/SAWYER *LABORERS - ZONE 2*	12/01/2021	$42.33	$9.10	$17.57	$0.00	$69.00
	06/01/2022	$43.33	$9.10	$17.57	$0.00	$70.00
	12/01/2022	$44.33	$9.10	$17.57	$0.00	$71.00
	06/01/2023	$45.33	$9.10	$17.57	$0.00	$72.00
	12/01/2023	$46.58	$9.10	$17.57	$0.00	$73.25
For apprentice rates see "Apprentice- LABORER"						
DEMO: JACKHAMMER OPERATOR *LABORERS - ZONE 2*	12/01/2021	$42.08	$9.10	$17.57	$0.00	$68.75
	06/01/2022	$43.08	$9.10	$17.57	$0.00	$69.75
	12/01/2022	$44.08	$9.10	$17.57	$0.00	$70.75
	06/01/2023	$45.08	$9.10	$17.57	$0.00	$71.75
	12/01/2023	$46.33	$9.10	$17.57	$0.00	$73.00
For apprentice rates see "Apprentice- LABORER"						
DEMO: WRECKING LABORER *LABORERS - ZONE 2*	12/01/2021	$41.33	$9.10	$17.57	$0.00	$68.00
	06/01/2022	$42.33	$9.10	$17.57	$0.00	$69.00
	12/01/2022	$43.33	$9.10	$17.57	$0.00	$70.00
	06/01/2023	$44.33	$9.10	$17.57	$0.00	$71.00
	12/01/2023	$45.58	$9.10	$17.57	$0.00	$72.25
For apprentice rates see "Apprentice- LABORER"						
DIRECTIONAL DRILL MACHINE OPERATOR *OPERATING ENGINEERS LOCAL 4*	12/01/2021	$50.83	$14.00	$16.05	$0.00	$80.88
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
DIVER *PILE DRIVER LOCAL 56 (ZONE 1)*	08/01/2020	$68.70	$9.40	$23.12	$0.00	$101.22
For apprentice rates see "Apprentice- PILE DRIVER"						
DIVER TENDER *PILE DRIVER LOCAL 56 (ZONE 1)*	08/01/2020	$49.07	$9.40	$23.12	$0.00	$81.59
For apprentice rates see "Apprentice- PILE DRIVER"						
DIVER TENDER (EFFLUENT) *PILE DRIVER LOCAL 56 (ZONE 1)*	08/01/2020	$73.60	$9.40	$23.12	$0.00	$106.12
For apprentice rates see "Apprentice- PILE DRIVER"						
DIVER/SLURRY (EFFLUENT) *PILE DRIVER LOCAL 56 (ZONE 1)*	08/01/2020	$103.05	$9.40	$23.12	$0.00	$135.57
For apprentice rates see "Apprentice- PILE DRIVER"						
DRAWBRIDGE OPERATOR (Construction) *DRAWBRIDGE - SEIU LOCAL 888*	07/01/2020	$26.77	$6.67	$3.93	$0.16	$37.53
ELECTRICIAN *ELECTRICIANS LOCAL 223*	09/01/2020	$43.66	$10.90	$14.66	$0.00	$69.22

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *ELECTRICIAN - Local 223*

Effective Date - 09/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	$17.46	$10.90	$0.52	$0.00	$28.88
2	45	$19.65	$10.90	$0.59	$0.00	$31.14
3	50	$21.83	$10.90	$0.65	$0.00	$33.38
4	55	$24.01	$10.90	$6.28	$0.00	$41.19
5	60	$26.20	$10.90	$6.77	$0.00	$43.87
6	65	$28.38	$10.90	$7.24	$0.00	$46.52
7	70	$30.56	$10.90	$7.73	$0.00	$49.19
8	75	$32.75	$10.90	$8.21	$0.00	$51.86

Notes:

Apprentice to Journeyworker Ratio:2:3***

ELEVATOR CONSTRUCTOR *ELEVATOR CONSTRUCTORS LOCAL 4*	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 - 01/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$31.74	$15.88	$0.00	$0.00	$47.62
2	55	$34.91	$15.88	$19.31	$0.00	$70.10
3	65	$41.26	$15.88	$19.31	$0.00	$76.45
4	70	$44.43	$15.88	$19.31	$0.00	$79.62
5	80	$50.78	$15.88	$19.31	$0.00	$85.97

Effective Date - 01/01/2022

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$32.81	$16.03	$0.00	$0.00	$48.84
2	55	$36.09	$16.03	$20.21	$0.00	$72.33
3	65	$42.65	$16.03	$20.21	$0.00	$78.89
4	70	$45.93	$16.03	$20.21	$0.00	$82.17
5	80	$52.50	$16.03	$20.21	$0.00	$88.74

Notes:

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

Apprentice to Journeyworker Ratio:1:1

ELEVATOR CONSTRUCTOR HELPER *ELEVATOR CONSTRUCTORS LOCAL 4*	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 (HEAVY & HIGHWAY) *LABORERS - ZONE 2 (HEAVY & HIGHWAY)*	12/01/2021	$35.66	$9.10	$16.64	$0.00	$61.40

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)						
FIELD ENG.INST.PERSON-BLDG,SITE,HVY/HWY *OPERATING ENGINEERS LOCAL 4*	11/01/2021	$46.53	$13.75	$15.80	$0.00	$76.08
	05/01/2022	$47.86	$13.75	$15.80	$0.00	$77.41
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
FIELD ENG.PARTY CHIEF-BLDG,SITE,HVY/HWY *OPERATING ENGINEERS LOCAL 4*	11/01/2021	$48.06	$13.75	$15.80	$0.00	$77.61
	05/01/2022	$49.22	$13.75	$15.80	$0.00	$78.77
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
FIELD ENG.ROD PERSON-BLDG,SITE,HVY/HWY *OPERATING ENGINEERS LOCAL 4*	11/01/2021	$23.16	$13.75	$15.80	$0.00	$52.71
	05/01/2022	$23.83	$13.75	$15.80	$0.00	$53.38
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
FIRE ALARM INSTALLER *ELECTRICIANS LOCAL 223*	09/01/2020	$43.66	$10.90	$14.66	$0.00	$69.22
For apprentice rates see "Apprentice- ELECTRICIAN"						
FIRE ALARM REPAIR / MAINTENANCE / COMMISSIONING*ELECTRICIANS LOCAL 223*	09/01/2020	$36.86	$10.90	$12.45	$0.00	$60.21
For apprentice rates see "Apprentice- TELECOMMUNICATIONS TECHNICIAN"						
FIREMAN (ASST. ENGINEER) *OPERATING ENGINEERS LOCAL 4*	12/01/2021	$41.76	$14.00	$16.05	$0.00	$71.81
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
FLAGGER & SIGNALER (HEAVY & HIGHWAY) *LABORERS - ZONE 2 (HEAVY & HIGHWAY)*	12/01/2021	$24.50	$9.10	$16.64	$0.00	$50.24
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)						
FLOORCOVERER *FLOORCOVERERS LOCAL 2168 ZONE I*	09/01/2021	$49.38	$8.58	$20.12	$0.00	$78.08
	03/01/2022	$50.18	$8.58	$20.12	$0.00	$78.88

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *FLOORCOVERER - Local 2168 Zone I*

Effective Date - 09/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$24.69	$8.58	$1.79	$0.00	$35.06
2	55	$27.16	$8.58	$1.79	$0.00	$37.53
3	60	$29.63	$8.58	$14.75	$0.00	$52.96
4	65	$32.10	$8.58	$14.75	$0.00	$55.43
5	70	$34.57	$8.58	$16.54	$0.00	$59.69
6	75	$37.04	$8.58	$16.54	$0.00	$62.16
7	80	$39.50	$8.58	$18.33	$0.00	$66.41
8	85	$41.97	$8.58	$18.33	$0.00	$68.88

Effective Date - 03/01/2022

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$25.09	$8.58	$1.79	$0.00	$35.46
2	55	$27.60	$8.58	$1.79	$0.00	$37.97
3	60	$30.11	$8.58	$14.75	$0.00	$53.44
4	65	$32.62	$8.58	$14.75	$0.00	$55.95
5	70	$35.13	$8.58	$16.54	$0.00	$60.25
6	75	$37.64	$8.58	$16.54	$0.00	$62.76
7	80	$40.14	$8.58	$18.33	$0.00	$67.05
8	85	$42.65	$8.58	$18.33	$0.00	$69.56

Notes: Steps are 750 hrs.
% After 10/1/17; 45/45/55/55/70/70/80/80 (1500hr Steps)
Step 1&2 $32.59/ 3&4 $39.26/ 5&6 $59.69/ 7&8 $66.41

Apprentice to Journeyworker Ratio:1:1

FORK LIFT/CHERRY PICKER *OPERATING ENGINEERS LOCAL 4*	12/01/2021	$51.38	$14.00	$16.05	$0.00	$81.43
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
GENERATOR/LIGHTING PLANT/HEATERS *OPERATING ENGINEERS LOCAL 4*	12/01/2021	$33.69	$14.00	$16.05	$0.00	$63.74
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
GLAZIER (GLASS PLANK/AIR BARRIER/INTERIOR SYSTEMS) *GLAZIERS LOCAL 35 (ZONE 2)*	07/01/2021	$42.36	$8.45	$22.90	$0.00	$73.71
	01/01/2022	$43.16	$8.65	$23.05	$0.00	$74.86
	07/01/2022	$44.36	$8.65	$23.05	$0.00	$76.06
	01/01/2023	$45.56	$8.65	$23.05	$0.00	$77.26
	07/01/2023	$46.76	$8.65	$23.05	$0.00	$78.46
	01/01/2024	$47.96	$8.65	$23.05	$0.00	$79.66
	07/01/2024	$49.16	$8.65	$23.05	$0.00	$80.86
	01/01/2025	$50.36	$8.65	$23.05	$0.00	$82.06

Apprentice - *GLAZIER - Local 35 Zone 2*

Effective Date - 07/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$21.18	$8.45	$0.00	$0.00	$29.63
2	55	$23.30	$8.45	$6.22	$0.00	$37.97
3	60	$25.42	$8.45	$6.78	$0.00	$40.65
4	65	$27.53	$8.45	$7.35	$0.00	$43.33
5	70	$29.65	$8.45	$19.51	$0.00	$57.61
6	75	$31.77	$8.45	$20.08	$0.00	$60.30
7	80	$33.89	$8.45	$20.64	$0.00	$62.98
8	90	$38.12	$8.45	$21.77	$0.00	$68.34

Effective Date - 01/01/2022

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$21.58	$8.65	$0.00	$0.00	$30.23
2	55	$23.74	$8.65	$6.27	$0.00	$38.66
3	60	$25.90	$8.65	$6.84	$0.00	$41.39
4	65	$28.05	$8.65	$7.41	$0.00	$44.11
5	70	$30.21	$8.65	$19.63	$0.00	$58.49
6	75	$32.37	$8.65	$20.20	$0.00	$61.22
7	80	$34.53	$8.65	$20.77	$0.00	$63.95
8	90	$38.84	$8.65	$21.91	$0.00	$69.40

Notes:
Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

HOISTING ENGINEER/CRANES/GRADALLS *OPERATING ENGINEERS LOCAL 4*	12/01/2021	$51.38	$14.00	$16.05	$0.00	$81.43

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *OPERATING ENGINEERS - Local 4*

Effective Date - 12/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	55	$28.26	$14.00	$0.00	$0.00	$42.26
2	60	$30.83	$14.00	$16.05	$0.00	$60.88
3	65	$33.40	$14.00	$16.05	$0.00	$63.45
4	70	$35.97	$14.00	$16.05	$0.00	$66.02
5	75	$38.54	$14.00	$16.05	$0.00	$68.59
6	80	$41.10	$14.00	$16.05	$0.00	$71.15
7	85	$43.67	$14.00	$16.05	$0.00	$73.72
8	90	$46.24	$14.00	$16.05	$0.00	$76.29

Notes:

Apprentice to Journeyworker Ratio:1:6

HVAC (DUCTWORK) *SHEETMETAL WORKERS LOCAL 17 - A*	08/01/2021	$51.95	$13.80	$25.60	$2.74	$94.09
	02/01/2022	$53.70	$13.80	$25.60	$2.79	$95.89
For apprentice rates see "Apprentice- SHEET METAL WORKER"						
HVAC (ELECTRICAL CONTROLS) *ELECTRICIANS LOCAL 223*	09/01/2020	$43.66	$10.90	$14.66	$0.00	$69.22
For apprentice rates see "Apprentice- ELECTRICIAN"						
HVAC (TESTING AND BALANCING - AIR) *SHEETMETAL WORKERS LOCAL 17 - A*	08/01/2021	$51.95	$13.80	$25.60	$2.74	$94.09
	02/01/2022	$53.70	$13.80	$25.60	$2.79	$95.89
For apprentice rates see "Apprentice- SHEET METAL WORKER"						
HVAC (TESTING AND BALANCING -WATER) *PIPEFITTERS LOCAL 537*	03/01/2021	$57.94	$11.70	$20.24	$0.00	$89.88
For apprentice rates see "Apprentice- PIPEFITTER" or "PLUMBER/PIPEFITTER"						
HVAC MECHANIC *PIPEFITTERS LOCAL 537*	03/01/2021	$57.94	$11.70	$20.24	$0.00	$89.88
For apprentice rates see "Apprentice- PIPEFITTER" or "PLUMBER/PIPEFITTER"						
HYDRAULIC DRILLS *LABORERS - ZONE 2*	12/01/2021	$36.16	$9.10	$16.64	$0.00	$61.90
	06/01/2022	$37.06	$9.10	$16.64	$0.00	$62.80
	12/01/2022	$37.91	$9.10	$16.64	$0.00	$63.65
	06/01/2023	$38.81	$9.10	$16.64	$0.00	$64.55
	12/01/2023	$39.71	$9.10	$16.64	$0.00	$65.45
For apprentice rates see "Apprentice- LABORER"						
HYDRAULIC DRILLS (HEAVY & HIGHWAY) *LABORERS - ZONE 2 (HEAVY & HIGHWAY)*	12/01/2021	$36.16	$9.10	$16.64	$0.00	$61.90
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
INSULATOR (PIPES & TANKS) *HEAT & FROST INSULATORS LOCAL 6 (SOUTHERN MASS)*	09/01/2021	$46.50	$13.80	$17.14	$0.00	$77.44
	09/01/2022	$48.95	$13.80	$17.14	$0.00	$79.89

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *ASBESTOS INSULATOR (Pipes & Tanks) - Local 6 Southern MA*

Effective Date - 09/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$23.25	$13.80	$12.42	$0.00	$49.47
2	60	$27.90	$13.80	$13.36	$0.00	$55.06
3	70	$32.55	$13.80	$14.31	$0.00	$60.66
4	80	$37.20	$13.80	$15.25	$0.00	$66.25

Effective Date - 09/01/2022

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$24.48	$13.80	$12.42	$0.00	$50.70
2	60	$29.37	$13.80	$13.36	$0.00	$56.53
3	70	$34.27	$13.80	$14.31	$0.00	$62.38
4	80	$39.16	$13.80	$15.25	$0.00	$68.21

Notes:
Steps are 1 year

Apprentice to Journeyworker Ratio:1:4

IRONWORKER/WELDER *IRONWORKERS LOCAL 37*	03/16/2021	$42.46	$7.70	$17.10	$0.00	$67.26

Apprentice - *IRONWORKER - Local 37*

Effective Date - 03/16/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	70	$29.72	$7.70	$17.10	$0.00	$54.52
2	75	$31.85	$7.70	$17.10	$0.00	$56.65
3	80	$33.97	$7.70	$17.10	$0.00	$58.77
4	85	$36.09	$7.70	$17.10	$0.00	$60.89
5	90	$38.21	$7.70	$17.10	$0.00	$63.01
6	95	$40.34	$7.70	$17.10	$0.00	$65.14

Notes:

Apprentice to Journeyworker Ratio:1:4

JACKHAMMER & PAVING BREAKER OPERATOR *LABORERS - ZONE 2*	12/01/2021	$35.66	$9.10	$16.64	$0.00	$61.40
	06/01/2022	$36.56	$9.10	$16.64	$0.00	$62.30
	12/01/2022	$37.41	$9.10	$16.64	$0.00	$63.15
	06/01/2023	$38.31	$9.10	$16.64	$0.00	$64.05
	12/01/2023	$39.21	$9.10	$16.64	$0.00	$64.95

For apprentice rates see "Apprentice- LABORER"

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
LABORER *LABORERS - ZONE 2*	12/01/2021	$35.41	$9.10	$16.64	$0.00	$61.15
	06/01/2022	$36.31	$9.10	$16.64	$0.00	$62.05
	12/01/2022	$37.16	$9.10	$16.64	$0.00	$62.90
	06/01/2023	$38.06	$9.10	$16.64	$0.00	$63.80
	12/01/2023	$38.96	$9.10	$16.64	$0.00	$64.70

Apprentice - *LABORER - Zone 2*

Effective Date - 12/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	$21.25	$9.10	$16.64	$0.00	$46.99
2	70	$24.79	$9.10	$16.64	$0.00	$50.53
3	80	$28.33	$9.10	$16.64	$0.00	$54.07
4	90	$31.87	$9.10	$16.64	$0.00	$57.61

Effective Date - 06/01/2022

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	$21.79	$9.10	$16.64	$0.00	$47.53
2	70	$25.42	$9.10	$16.64	$0.00	$51.16
3	80	$29.05	$9.10	$16.64	$0.00	$54.79
4	90	$32.68	$9.10	$16.64	$0.00	$58.42

Notes:

Apprentice to Journeyworker Ratio:1:5

LABORER (HEAVY & HIGHWAY) *LABORERS - ZONE 2 (HEAVY & HIGHWAY)*	12/01/2021	$35.41	$9.10	$16.64	$0.00	$61.15

Apprentice - *LABORER (Heavy & Highway) - Zone 2*

Effective Date - 12/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	$21.25	$9.10	$16.64	$0.00	$46.99
2	70	$24.79	$9.10	$16.64	$0.00	$50.53
3	80	$28.33	$9.10	$16.64	$0.00	$54.07
4	90	$31.87	$9.10	$16.64	$0.00	$57.61

Notes:

Apprentice to Journeyworker Ratio:1:5

LABORER: CARPENTER TENDER *LABORERS - ZONE 2*	12/01/2021	$35.41	$9.10	$16.64	$0.00	$61.15
	06/01/2022	$36.31	$9.10	$16.64	$0.00	$62.05
	12/01/2022	$37.16	$9.10	$16.64	$0.00	$62.90
	06/01/2023	$38.06	$9.10	$16.64	$0.00	$63.80
	12/01/2023	$38.96	$9.10	$16.64	$0.00	$64.70

For apprentice rates see "Apprentice- LABORER"

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
LABORER: CEMENT FINISHER TENDER *LABORERS - ZONE 2*	12/01/2021	$35.41	$9.10	$16.64	$0.00	$61.15
	06/01/2022	$36.31	$9.10	$16.64	$0.00	$62.05
	12/01/2022	$37.16	$9.10	$16.64	$0.00	$62.90
	06/01/2023	$38.06	$9.10	$16.64	$0.00	$63.80
	12/01/2023	$38.96	$9.10	$16.64	$0.00	$64.70
For apprentice rates see "Apprentice- LABORER"						
LABORER: HAZARDOUS WASTE/ASBESTOS REMOVER *LABORERS - ZONE 2*	12/01/2021	$35.50	$9.10	$16.70	$0.00	$61.30
	06/01/2022	$36.40	$9.10	$16.70	$0.00	$62.20
	12/01/2022	$37.25	$9.10	$16.70	$0.00	$63.05
	06/01/2023	$38.15	$9.10	$16.70	$0.00	$63.95
	12/01/2023	$39.05	$9.10	$16.70	$0.00	$64.85
For apprentice rates see "Apprentice- LABORER"						
LABORER: MASON TENDER *LABORERS - ZONE 2*	12/01/2021	$35.66	$9.10	$16.64	$0.00	$61.40
	06/01/2022	$36.56	$9.10	$16.64	$0.00	$62.30
	12/01/2022	$37.41	$9.10	$16.64	$0.00	$63.15
	06/01/2023	$38.31	$9.10	$16.64	$0.00	$64.05
	12/01/2023	$39.21	$9.10	$16.64	$0.00	$64.95
For apprentice rates see "Apprentice- LABORER"						
LABORER: MASON TENDER (HEAVY & HIGHWAY) *LABORERS - ZONE 2 (HEAVY & HIGHWAY)*	12/01/2021	$35.66	$9.10	$16.64	$0.00	$61.40
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
LABORER: MULTI-TRADE TENDER *LABORERS - ZONE 2*	12/01/2021	$35.41	$9.10	$16.64	$0.00	$61.15
	06/01/2022	$36.31	$9.10	$16.64	$0.00	$62.05
	12/01/2022	$37.16	$9.10	$16.64	$0.00	$62.90
	06/01/2023	$38.06	$9.10	$16.64	$0.00	$63.80
	12/01/2023	$38.96	$9.10	$16.64	$0.00	$64.70
For apprentice rates see "Apprentice- LABORER"						
LABORER: TREE REMOVER *LABORERS - ZONE 2*	12/01/2021	$35.41	$9.10	$16.64	$0.00	$61.15
	06/01/2022	$36.31	$9.10	$16.64	$0.00	$62.05
	12/01/2022	$37.16	$9.10	$16.64	$0.00	$62.90
	06/01/2023	$38.06	$9.10	$16.64	$0.00	$63.80
	12/01/2023	$38.96	$9.10	$16.64	$0.00	$64.70
This classification applies to the removal of standing trees, and the trimming and removal of branches and limbs when related to public works construction or site clearance incidental to construction . For apprentice rates see "Apprentice- LABORER"						
LASER BEAM OPERATOR *LABORERS - ZONE 2*	12/01/2021	$35.66	$9.10	$16.64	$0.00	$61.40
	06/01/2022	$36.56	$9.10	$16.64	$0.00	$62.30
	12/01/2022	$37.41	$9.10	$16.64	$0.00	$63.15
	06/01/2023	$38.31	$9.10	$16.64	$0.00	$64.05
	12/01/2023	$39.21	$9.10	$16.64	$0.00	$64.95
For apprentice rates see "Apprentice- LABORER"						
LASER BEAM OPERATOR (HEAVY & HIGHWAY) *LABORERS - ZONE 2 (HEAVY & HIGHWAY)*	12/01/2021	$35.66	$9.10	$16.64	$0.00	$61.40
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
MARBLE & TILE FINISHERS *BRICKLAYERS LOCAL 3 - MARBLE & TILE*	08/01/2021	$43.69	$11.39	$20.30	$0.00	$75.38
	02/01/2022	$44.16	$11.39	$20.30	$0.00	$75.85

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

Effective Date - 08/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$21.85	$11.39	$20.30	$0.00	$53.54
2	60	$26.21	$11.39	$20.30	$0.00	$57.90
3	70	$30.58	$11.39	$20.30	$0.00	$62.27
4	80	$34.95	$11.39	$20.30	$0.00	$66.64
5	90	$39.32	$11.39	$20.30	$0.00	$71.01

Effective Date - 02/01/2022

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$22.08	$11.39	$20.30	$0.00	$53.77
2	60	$26.50	$11.39	$20.30	$0.00	$58.19
3	70	$30.91	$11.39	$20.30	$0.00	$62.60
4	80	$35.33	$11.39	$20.30	$0.00	$67.02
5	90	$39.74	$11.39	$20.30	$0.00	$71.43

Notes:

Apprentice to Journeyworker Ratio:1:3

MARBLE MASONS,TILELAYERS & TERRAZZO MECH *BRICKLAYERS LOCAL 3 - MARBLE & TILE*	08/01/2021	$57.17	$11.39	$22.24	$0.00	$90.80
	02/01/2022	$57.74	$11.39	$22.24	$0.00	$91.37

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

Effective Date - 08/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$28.59	$11.39	$22.24	$0.00	$62.22
2	60	$34.30	$11.39	$22.24	$0.00	$67.93
3	70	$40.02	$11.39	$22.24	$0.00	$73.65
4	80	$45.74	$11.39	$22.24	$0.00	$79.37
5	90	$51.45	$11.39	$22.24	$0.00	$85.08

Effective Date - 02/01/2022

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$28.87	$11.39	$22.24	$0.00	$62.50
2	60	$34.64	$11.39	$22.24	$0.00	$68.27
3	70	$40.42	$11.39	$22.24	$0.00	$74.05
4	80	$46.19	$11.39	$22.24	$0.00	$79.82
5	90	$51.97	$11.39	$22.24	$0.00	$85.60

Notes:

Apprentice to Journeyworker Ratio:1:5

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
MECH. SWEEPER OPERATOR (ON CONST. SITES) *OPERATING ENGINEERS LOCAL 4* For apprentice rates see "Apprentice- OPERATING ENGINEERS"	12/01/2021	$50.83	$14.00	$16.05	$0.00	$80.88
MECHANICS MAINTENANCE *OPERATING ENGINEERS LOCAL 4* For apprentice rates see "Apprentice- OPERATING ENGINEERS"	12/01/2021	$50.83	$14.00	$16.05	$0.00	$80.88
MILLWRIGHT (Zone 2) *MILLWRIGHTS LOCAL 1121 - Zone 2*	03/01/2021	$39.42	$8.58	$21.57	$0.00	$69.57
	01/03/2022	$40.67	$8.58	$21.57	$0.00	$70.82
	01/02/2023	$41.92	$8.58	$21.57	$0.00	$72.07

Apprentice - *MILLWRIGHT - Local 1121 Zone 2*

Effective Date - 03/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	55	$21.68	$8.58	$5.72	$0.00	$35.98
2	65	$25.62	$8.58	$17.93	$0.00	$52.13
3	75	$29.57	$8.58	$18.98	$0.00	$57.13
4	85	$33.51	$8.58	$20.01	$0.00	$62.10

Effective Date - 01/03/2022

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	55	$22.37	$8.58	$5.72	$0.00	$36.67
2	65	$26.44	$8.58	$17.93	$0.00	$52.95
3	75	$30.50	$8.58	$18.98	$0.00	$58.06
4	85	$34.57	$8.58	$20.01	$0.00	$63.16

Notes: Step 1&2 Appr. indentured after 1/6/2020 receive no pension, but do receive annuity. (Step 1 $5.72, Step 2 $6.66)
Steps are 2,000 hours

Apprentice to Journeyworker Ratio:1:5

MORTAR MIXER *LABORERS - ZONE 2* For apprentice rates see "Apprentice- LABORER"	12/01/2021	$35.66	$9.10	$16.64	$0.00	$61.40
	06/01/2022	$36.56	$9.10	$16.64	$0.00	$62.30
	12/01/2022	$37.41	$9.10	$16.64	$0.00	$63.15
	06/01/2023	$38.31	$9.10	$16.64	$0.00	$64.05
	12/01/2023	$39.21	$9.10	$16.64	$0.00	$64.95
OILER (OTHER THAN TRUCK CRANES,GRADALLS) *OPERATING ENGINEERS LOCAL 4* For apprentice rates see "Apprentice- OPERATING ENGINEERS"	12/01/2021	$23.48	$14.00	$16.05	$0.00	$53.53
OILER (TRUCK CRANES, GRADALLS) *OPERATING ENGINEERS LOCAL 4* For apprentice rates see "Apprentice- OPERATING ENGINEERS"	12/01/2021	$28.44	$14.00	$16.05	$0.00	$58.49
OTHER POWER DRIVEN EQUIPMENT - CLASS II *OPERATING ENGINEERS LOCAL 4* For apprentice rates see "Apprentice- OPERATING ENGINEERS"	12/01/2021	$50.83	$14.00	$16.05	$0.00	$80.88

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
PAINTER (BRIDGES/TANKS) *PAINTERS LOCAL 35 - ZONE 2*	07/01/2021	$52.86	$8.45	$22.90	$0.00	$84.21
	01/01/2022	$53.66	$8.65	$23.05	$0.00	$85.36
	07/01/2022	$54.86	$8.65	$23.05	$0.00	$86.56
	01/01/2023	$56.06	$8.65	$23.05	$0.00	$87.76
	07/01/2023	$57.26	$8.65	$23.05	$0.00	$88.96
	01/01/2024	$58.46	$8.65	$23.05	$0.00	$90.16
	07/01/2024	$59.66	$8.65	$23.05	$0.00	$91.36
	01/01/2025	$60.86	$8.65	$23.05	$0.00	$92.56

Apprentice - *PAINTER Local 35 - BRIDGES/TANKS*

Effective Date - 07/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$26.43	$8.45	$0.00	$0.00	$34.88
2	55	$29.07	$8.45	$6.22	$0.00	$43.74
3	60	$31.72	$8.45	$6.78	$0.00	$46.95
4	65	$34.36	$8.45	$7.35	$0.00	$50.16
5	70	$37.00	$8.45	$19.51	$0.00	$64.96
6	75	$39.65	$8.45	$20.08	$0.00	$68.18
7	80	$42.29	$8.45	$20.64	$0.00	$71.38
8	90	$47.57	$8.45	$21.77	$0.00	$77.79

Effective Date - 01/01/2022

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$26.83	$8.65	$0.00	$0.00	$35.48
2	55	$29.51	$8.65	$6.27	$0.00	$44.43
3	60	$32.20	$8.65	$6.84	$0.00	$47.69
4	65	$34.88	$8.65	$7.41	$0.00	$50.94
5	70	$37.56	$8.65	$19.63	$0.00	$65.84
6	75	$40.25	$8.65	$20.20	$0.00	$69.10
7	80	$42.93	$8.65	$20.77	$0.00	$72.35
8	90	$48.29	$8.65	$21.91	$0.00	$78.85

Notes:

Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

PAINTER (SPRAY OR SANDBLAST, NEW) * * If 30% or more of surfaces to be painted are new construction, NEW paint rate shall be used.*PAINTERS LOCAL 35 - ZONE 2*	07/01/2021	$43.76	$8.45	$22.90	$0.00	$75.11
	01/01/2022	$44.56	$8.65	$23.05	$0.00	$76.26
	07/01/2022	$45.76	$8.65	$23.05	$0.00	$77.46
	01/01/2023	$46.96	$8.65	$23.05	$0.00	$78.66
	07/01/2023	$48.16	$8.65	$23.05	$0.00	$79.86
	01/01/2024	$49.36	$8.65	$23.05	$0.00	$81.06
	07/01/2024	$50.56	$8.65	$23.05	$0.00	$82.26
	01/01/2025	$51.76	$8.65	$23.05	$0.00	$83.46

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

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

Effective Date - 07/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$21.88	$8.45	$0.00	$0.00	$30.33
2	55	$24.07	$8.45	$6.22	$0.00	$38.74
3	60	$26.26	$8.45	$6.78	$0.00	$41.49
4	65	$28.44	$8.45	$7.35	$0.00	$44.24
5	70	$30.63	$8.45	$19.51	$0.00	$58.59
6	75	$32.82	$8.45	$20.08	$0.00	$61.35
7	80	$35.01	$8.45	$20.64	$0.00	$64.10
8	90	$39.38	$8.45	$21.77	$0.00	$69.60

Effective Date - 01/01/2022

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$22.28	$8.65	$0.00	$0.00	$30.93
2	55	$24.51	$8.65	$6.27	$0.00	$39.43
3	60	$26.74	$8.65	$6.84	$0.00	$42.23
4	65	$28.96	$8.65	$19.06	$0.00	$56.67
5	70	$31.19	$8.65	$19.63	$0.00	$59.47
6	75	$33.42	$8.65	$20.20	$0.00	$62.27
7	80	$35.65	$8.65	$20.77	$0.00	$65.07
8	90	$40.10	$8.65	$21.91	$0.00	$70.66

Notes:
Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

PAINTER (SPRAY OR SANDBLAST, REPAINT) *PAINTERS LOCAL 35 - ZONE 2*	07/01/2021	$41.82	$8.45	$22.90	$0.00	$73.17
	01/01/2022	$42.62	$8.65	$23.05	$0.00	$74.32
	07/01/2022	$43.82	$8.65	$23.05	$0.00	$75.52
	01/01/2023	$45.02	$8.65	$23.05	$0.00	$76.72
	07/01/2023	$46.22	$8.65	$23.05	$0.00	$77.92
	01/01/2024	$47.42	$8.65	$23.05	$0.00	$79.12
	07/01/2024	$48.62	$8.65	$23.05	$0.00	$80.32
	01/01/2025	$49.82	$8.65	$23.05	$0.00	$81.52

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

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

Effective Date - 07/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$20.91	$8.45	$0.00	$0.00	$29.36
2	55	$23.00	$8.45	$6.22	$0.00	$37.67
3	60	$25.09	$8.45	$6.78	$0.00	$40.32
4	65	$27.18	$8.45	$7.35	$0.00	$42.98
5	70	$29.27	$8.45	$19.51	$0.00	$57.23
6	75	$31.37	$8.45	$20.08	$0.00	$59.90
7	80	$33.46	$8.45	$20.64	$0.00	$62.55
8	90	$37.64	$8.45	$21.77	$0.00	$67.86

Effective Date - 01/01/2022

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$21.31	$8.65	$0.00	$0.00	$29.96
2	55	$23.44	$8.65	$6.27	$0.00	$38.36
3	60	$25.57	$8.65	$6.84	$0.00	$41.06
4	65	$27.70	$8.65	$7.41	$0.00	$43.76
5	70	$29.83	$8.65	$19.63	$0.00	$58.11
6	75	$31.97	$8.65	$20.20	$0.00	$60.82
7	80	$34.10	$8.65	$20.77	$0.00	$63.52
8	90	$38.36	$8.65	$21.91	$0.00	$68.92

Notes:
Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

PAINTER / TAPER (BRUSH, NEW) *	07/01/2021	$42.36	$8.45	$22.90	$0.00	$73.71
* If 30% or more of surfaces to be painted are new construction, NEW paint rate shall be used.*PAINTERS LOCAL 35 - ZONE 2*	01/01/2022	$43.16	$8.65	$23.05	$0.00	$74.86
	07/01/2022	$44.36	$8.65	$23.05	$0.00	$76.06
	01/01/2023	$45.56	$8.65	$23.05	$0.00	$77.26
	07/01/2023	$46.76	$8.65	$23.05	$0.00	$78.46
	01/01/2024	$47.96	$8.65	$23.05	$0.00	$79.66
	07/01/2024	$49.16	$8.65	$23.05	$0.00	$80.86
	01/01/2025	$50.36	$8.65	$23.05	$0.00	$82.06

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

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

Effective Date - 07/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$21.18	$8.45	$0.00	$0.00	$29.63
2	55	$23.30	$8.45	$6.22	$0.00	$37.97
3	60	$25.42	$8.45	$6.78	$0.00	$40.65
4	65	$27.53	$8.45	$7.35	$0.00	$43.33
5	70	$29.65	$8.45	$19.51	$0.00	$57.61
6	75	$31.77	$8.45	$20.08	$0.00	$60.30
7	80	$33.89	$8.45	$20.64	$0.00	$62.98
8	90	$38.12	$8.45	$21.77	$0.00	$68.34

Effective Date - 01/01/2022

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$21.58	$8.65	$0.00	$0.00	$30.23
2	55	$23.74	$8.65	$6.27	$0.00	$38.66
3	60	$25.90	$8.65	$6.84	$0.00	$41.39
4	65	$28.05	$8.65	$7.41	$0.00	$44.11
5	70	$30.21	$8.65	$19.63	$0.00	$58.49
6	75	$32.37	$8.65	$20.20	$0.00	$61.22
7	80	$34.53	$8.65	$20.77	$0.00	$63.95
8	90	$38.84	$8.65	$21.91	$0.00	$69.40

Notes:
Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

PAINTER / TAPER (BRUSH, REPAINT) *PAINTERS LOCAL 35 - ZONE 2*	07/01/2021	$40.42	$8.45	$22.90	$0.00	$71.77
	01/01/2022	$41.22	$8.65	$23.05	$0.00	$72.92
	07/01/2022	$42.42	$8.65	$23.05	$0.00	$74.12
	01/01/2023	$43.62	$8.65	$23.05	$0.00	$75.32
	07/01/2023	$44.82	$8.65	$23.05	$0.00	$76.52
	01/01/2024	$46.02	$8.65	$23.05	$0.00	$77.72
	07/01/2024	$47.22	$8.65	$23.05	$0.00	$78.92
	01/01/2025	$48.42	$8.65	$23.05	$0.00	$80.12

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

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

Effective Date - 07/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$20.21	$8.45	$0.00	$0.00	$28.66
2	55	$22.23	$8.45	$6.22	$0.00	$36.90
3	60	$24.25	$8.45	$6.78	$0.00	$39.48
4	65	$26.27	$8.45	$7.35	$0.00	$42.07
5	70	$28.29	$8.45	$19.51	$0.00	$56.25
6	75	$30.32	$8.45	$20.08	$0.00	$58.85
7	80	$32.34	$8.45	$20.64	$0.00	$61.43
8	90	$36.38	$8.45	$21.77	$0.00	$66.60

Effective Date - 01/01/2022

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$20.61	$8.65	$0.00	$0.00	$29.26
2	55	$22.67	$8.65	$6.27	$0.00	$37.59
3	60	$24.73	$8.65	$6.84	$0.00	$40.22
4	65	$26.79	$8.65	$7.41	$0.00	$42.85
5	70	$28.85	$8.65	$19.63	$0.00	$57.13
6	75	$30.92	$8.65	$20.20	$0.00	$59.77
7	80	$32.98	$8.65	$20.77	$0.00	$62.40
8	90	$37.10	$8.65	$21.91	$0.00	$67.66

Notes:
Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

PAINTER TRAFFIC MARKINGS (HEAVY/HIGHWAY) *LABORERS - ZONE 2 (HEAVY & HIGHWAY)* For apprentice rates see "Apprentice- LABORER (Heavy and Highway)	12/01/2021	$35.41	$9.10	$16.64	$0.00	$61.15
PANEL & PICKUP TRUCKS DRIVER *TEAMSTERS JOINT COUNCIL NO. 10 ZONE B*	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"	08/01/2020	$49.07	$9.40	$23.12	$0.00	$81.59
PILE DRIVER *PILE DRIVER LOCAL 56 (ZONE 1)*	08/01/2020	$49.07	$9.40	$23.12	$0.00	$81.59

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *PILE DRIVER - Local 56 Zone 1*

Effective Date - 08/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$24.54	$9.40	$23.12	$0.00	$57.06
2	60	$29.44	$9.40	$23.12	$0.00	$61.96
3	70	$34.35	$9.40	$23.12	$0.00	$66.87
4	75	$36.80	$9.40	$23.12	$0.00	$69.32
5	80	$39.26	$9.40	$23.12	$0.00	$71.78
6	80	$39.26	$9.40	$23.12	$0.00	$71.78
7	90	$44.16	$9.40	$23.12	$0.00	$76.68
8	90	$44.16	$9.40	$23.12	$0.00	$76.68

Notes:

% Indentured After 10/1/17; 45/45/55/55/70/70/80/80
Step 1&2 $34.01/ 3&4 $41.46/ 5&6 $62.80/ 7&8 $69.25

Apprentice to Journeyworker Ratio:1:5

PIPEFITTER & STEAMFITTER *PIPEFITTERS LOCAL 537*	03/01/2021	$57.94	$11.70	$20.24	$0.00	$89.88

Apprentice - *PIPEFITTER - Local 537*

Effective Date - 03/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	$23.18	$11.70	$8.25	$0.00	$43.13
2	45	$26.07	$11.70	$20.24	$0.00	$58.01
3	60	$34.76	$11.70	$20.24	$0.00	$66.70
4	70	$40.56	$11.70	$20.24	$0.00	$72.50
5	80	$46.35	$11.70	$20.24	$0.00	$78.29

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 *LABORERS - ZONE 2*	12/01/2021	$35.66	$9.10	$16.64	$0.00	$61.40
	06/01/2022	$36.56	$9.10	$16.64	$0.00	$62.30
	12/01/2022	$37.41	$9.10	$16.64	$0.00	$63.15
	06/01/2023	$38.31	$9.10	$16.64	$0.00	$64.05
	12/01/2023	$39.21	$9.10	$16.64	$0.00	$64.95

For apprentice rates see "Apprentice- LABORER"

PIPELAYER (HEAVY & HIGHWAY) *LABORERS - ZONE 2 (HEAVY & HIGHWAY)*	12/01/2021	$35.66	$9.10	$16.64	$0.00	$61.40

For apprentice rates see "Apprentice- LABORER (Heavy and Highway)

PLUMBERS & GASFITTERS *PLUMBERS & GASFITTERS LOCAL 12*	03/01/2021	$60.19	$13.57	$17.26	$0.00	$91.02

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *PLUMBER/GASFITTER - Local 12*

Effective Date - 03/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	35	$21.07	$13.57	$6.24	$0.00	$40.88
2	40	$24.08	$13.57	$7.08	$0.00	$44.73
3	55	$33.10	$13.57	$9.63	$0.00	$56.30
4	65	$39.12	$13.57	$11.33	$0.00	$64.02
5	75	$45.14	$13.57	$13.03	$0.00	$71.74

Notes:
** 1:2; 2:6; 3:10; 4:14; 5:19/Steps are 1 yr
Step4 with lic$67.89, Step5 with lic$75.59

Apprentice to Journeyworker Ratio:**

PNEUMATIC CONTROLS (TEMP.) *PIPEFITTERS LOCAL 537*	03/01/2021	$57.94	$11.70	$20.24	$0.00	$89.88
For apprentice rates see "Apprentice- PIPEFITTER" or "PLUMBER/PIPEFITTER"						
PNEUMATIC DRILL/TOOL OPERATOR *LABORERS - ZONE 2*	12/01/2021	$35.66	$9.10	$16.64	$0.00	$61.40
	06/01/2022	$36.56	$9.10	$16.64	$0.00	$62.30
	12/01/2022	$37.41	$9.10	$16.64	$0.00	$63.15
	06/01/2023	$38.31	$9.10	$16.64	$0.00	$64.05
	12/01/2023	$39.21	$9.10	$16.64	$0.00	$64.95
For apprentice rates see "Apprentice- LABORER"						
PNEUMATIC DRILL/TOOL OPERATOR (HEAVY & HIGHWAY) *LABORERS - ZONE 2 (HEAVY & HIGHWAY)*	12/01/2021	$35.66	$9.10	$16.64	$0.00	$61.40
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)						
POWDERMAN & BLASTER *LABORERS - ZONE 2*	12/01/2021	$36.41	$9.10	$16.64	$0.00	$62.15
	06/01/2022	$37.31	$9.10	$16.64	$0.00	$63.05
	12/01/2022	$38.16	$9.10	$16.64	$0.00	$63.90
	06/01/2023	$39.06	$9.10	$16.64	$0.00	$64.80
	12/01/2023	$39.96	$9.10	$16.64	$0.00	$65.70
For apprentice rates see "Apprentice- LABORER"						
POWDERMAN & BLASTER (HEAVY & HIGHWAY) *LABORERS - ZONE 2 (HEAVY & HIGHWAY)*	12/01/2021	$36.41	$9.10	$16.64	$0.00	$62.15
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)						
POWER SHOVEL/DERRICK/TRENCHING MACHINE *OPERATING ENGINEERS LOCAL 4*	12/01/2021	$51.38	$14.00	$16.05	$0.00	$81.43
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
PUMP OPERATOR (CONCRETE) *OPERATING ENGINEERS LOCAL 4*	12/01/2021	$51.38	$14.00	$16.05	$0.00	$81.43
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
PUMP OPERATOR (DEWATERING, OTHER) *OPERATING ENGINEERS LOCAL 4*	12/01/2021	$33.69	$14.00	$16.05	$0.00	$63.74
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
READY-MIX CONCRETE DRIVER *TEAMSTERS 170 - Dauphinais (Bellingham)*	12/01/2021	$25.75	$9.76	$4.00	$0.00	$39.51
	01/01/2022	$25.75	$9.76	$4.00	$0.00	$39.51
	12/01/2022	$26.40	$10.26	$4.75	$0.00	$41.41
	01/01/2023	$26.40	$10.26	$4.75	$0.00	$41.41
	12/01/2023	$27.00	$10.76	$5.45	$0.00	$43.21
	01/01/2024	$27.00	$10.76	$5.45	$0.00	$43.21
	12/01/2024	$27.60	$11.26	$6.15	$0.00	$45.01
	01/01/2025	$27.60	$11.26	$6.15	$0.00	$45.01
RECLAIMERS *OPERATING ENGINEERS LOCAL 4* For apprentice rates see "Apprentice- OPERATING ENGINEERS"	12/01/2021	$50.83	$14.00	$16.05	$0.00	$80.88
RIDE-ON MOTORIZED BUGGY OPERATOR *LABORERS - ZONE 2*	12/01/2021	$35.66	$9.10	$16.64	$0.00	$61.40
	06/01/2022	$36.56	$9.10	$16.64	$0.00	$62.30
	12/01/2022	$37.41	$9.10	$16.64	$0.00	$63.15
	06/01/2023	$38.31	$9.10	$16.64	$0.00	$64.05
	12/01/2023	$39.21	$9.10	$16.64	$0.00	$64.95
For apprentice rates see "Apprentice- LABORER"						
ROLLER/SPREADER/MULCHING MACHINE *OPERATING ENGINEERS LOCAL 4* For apprentice rates see "Apprentice- OPERATING ENGINEERS"	12/01/2021	$50.83	$14.00	$16.05	$0.00	$80.88
ROOFER (Inc.Roofer Waterproofng &Roofer Damproofg) *ROOFERS LOCAL 33*	08/01/2021	$47.03	$12.28	$18.15	$0.00	$77.46
	02/01/2022	$48.46	$12.28	$18.15	$0.00	$78.89

Apprentice - *ROOFER - Local 33*

Effective Date - 08/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$23.52	$12.28	$4.56	$0.00	$40.36
2	60	$28.22	$12.28	$18.15	$0.00	$58.65
3	65	$30.57	$12.28	$18.15	$0.00	$61.00
4	75	$35.27	$12.28	$18.15	$0.00	$65.70
5	85	$39.98	$12.28	$18.15	$0.00	$70.41

Effective Date - 02/01/2022

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$24.23	$12.28	$4.56	$0.00	$41.07
2	60	$29.08	$12.28	$18.15	$0.00	$59.51
3	65	$31.50	$12.28	$18.15	$0.00	$61.93
4	75	$36.35	$12.28	$18.15	$0.00	$66.78
5	85	$41.19	$12.28	$18.15	$0.00	$71.62

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 *ROOFERS LOCAL 33* For apprentice rates see "Apprentice- ROOFER"	08/01/2021	$47.28	$12.28	$18.15	$0.00	$77.71
	02/01/2022	$48.71	$12.28	$18.15	$0.00	$79.14

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
SHEETMETAL WORKER *SHEETMETAL WORKERS LOCAL 17 - A*	08/01/2021	$51.95	$13.80	$25.60	$2.74	$94.09
	02/01/2022	$53.70	$13.80	$25.60	$2.79	$95.89

Apprentice - *SHEET METAL WORKER - Local 17-A*

Effective Date - 08/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	42	$21.82	$13.80	$6.01	$0.00	$41.63
2	42	$21.82	$13.80	$6.01	$0.00	$41.63
3	47	$24.42	$13.80	$11.26	$1.48	$50.96
4	47	$24.42	$13.80	$11.26	$1.48	$50.96
5	52	$27.01	$13.80	$12.23	$1.59	$54.63
6	52	$27.01	$13.80	$12.48	$1.60	$54.89
7	60	$31.17	$13.80	$13.87	$1.77	$60.61
8	65	$33.77	$13.80	$14.84	$1.87	$64.28
9	75	$38.96	$13.80	$16.77	$2.09	$71.62
10	85	$44.16	$13.80	$18.20	$2.28	$78.44

Effective Date - 02/01/2022

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	42	$22.55	$13.80	$6.01	$0.00	$42.36
2	42	$22.55	$13.80	$6.01	$0.00	$42.36
3	47	$25.24	$13.80	$11.26	$1.51	$51.81
4	47	$25.24	$13.80	$11.26	$1.51	$51.81
5	52	$27.92	$13.80	$12.23	$1.62	$55.57
6	52	$27.92	$13.80	$12.48	$1.63	$55.83
7	60	$32.22	$13.80	$13.87	$1.80	$61.69
8	65	$34.91	$13.80	$14.84	$1.91	$65.46
9	75	$40.28	$13.80	$16.77	$2.13	$72.98
10	85	$45.65	$13.80	$18.20	$2.33	$79.98

Notes:
Steps are 6 mos.

Apprentice to Journeyworker Ratio:1:4

SPECIALIZED EARTH MOVING EQUIP < 35 TONS *TEAMSTERS JOINT COUNCIL NO. 10 ZONE B*	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*	12/01/2021	$36.53	$13.41	$16.01	$0.00	$65.95
SPRINKLER FITTER *SPRINKLER FITTERS LOCAL 550 - (Section A) Zone 1*	03/01/2021	$62.45	$10.00	$21.25	$0.00	$93.70

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *SPRINKLER FITTER - Local 550 (Section A) Zone 1*

Effective Date - 03/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	35	$21.86	$10.00	$11.99	$0.00	$43.85
2	40	$24.98	$10.00	$12.70	$0.00	$47.68
3	45	$28.10	$10.00	$13.41	$0.00	$51.51
4	50	$31.23	$10.00	$14.13	$0.00	$55.36
5	55	$34.35	$10.00	$14.84	$0.00	$59.19
6	60	$37.47	$10.00	$15.55	$0.00	$63.02
7	65	$40.59	$10.00	$16.26	$0.00	$66.85
8	70	$43.72	$10.00	$16.98	$0.00	$70.70
9	75	$46.84	$10.00	$17.69	$0.00	$74.53
10	80	$49.96	$10.00	$18.40	$0.00	$78.36

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 *OPERATING ENGINEERS LOCAL 4*	12/01/2021	$50.83	$14.00	$16.05	$0.00	$80.88
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
TAMPERS, SELF-PROPELLED OR TRACTOR DRAWN *OPERATING ENGINEERS LOCAL 4*	12/01/2021	$50.83	$14.00	$16.05	$0.00	$80.88
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
TELECOMMUNICATION TECHNICIAN *ELECTRICIANS LOCAL 223*	09/01/2020	$36.86	$10.90	$12.45	$0.00	$60.21

Apprentice - *TELECOMMUNICATION TECHNICIAN - Local 223*

Effective Date - 09/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	0	$0.00	$0.00	$0.00	$0.00	$0.00

Notes: See Electrician Apprentice Wages

Telecom Apprentice Wages shall be the same as the Electrician Apprentice Wages

Apprentice to Journeyworker Ratio:2:3***

TERRAZZO FINISHERS *BRICKLAYERS LOCAL 3 - MARBLE & TILE*	08/01/2021	$56.09	$11.39	$22.25	$0.00	$89.73
	02/01/2022	$56.68	$11.39	$22.25	$0.00	$90.32

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *TERRAZZO FINISHER - Local 3 Marble & Tile*

Effective Date - 08/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$28.05	$11.39	$22.25	$0.00	$61.69
2	60	$33.65	$11.39	$22.25	$0.00	$67.29
3	70	$39.26	$11.39	$22.25	$0.00	$72.90
4	80	$44.87	$11.39	$22.25	$0.00	$78.51
5	90	$50.48	$11.39	$22.25	$0.00	$84.12

Effective Date - 02/01/2022

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$28.34	$11.39	$22.25	$0.00	$61.98
2	60	$34.01	$11.39	$22.25	$0.00	$67.65
3	70	$39.68	$11.39	$22.25	$0.00	$73.32
4	80	$45.34	$11.39	$22.25	$0.00	$78.98
5	90	$51.01	$11.39	$22.25	$0.00	$84.65

Notes:

Apprentice to Journeyworker Ratio:1:3

TEST BORING DRILLER *LABORERS - FOUNDATION AND MARINE*	12/01/2021	$42.58	$9.10	$17.72	$0.00	$69.40
For apprentice rates see "Apprentice- LABORER"						
TEST BORING DRILLER HELPER *LABORERS - FOUNDATION AND MARINE*	12/01/2021	$41.30	$9.10	$17.72	$0.00	$68.12
For apprentice rates see "Apprentice- LABORER"						
TEST BORING LABORER *LABORERS - FOUNDATION AND MARINE*	12/01/2021	$41.18	$9.10	$17.72	$0.00	$68.00
For apprentice rates see "Apprentice- LABORER"						
TRACTORS/PORTABLE STEAM GENERATORS *OPERATING ENGINEERS LOCAL 4*	12/01/2021	$50.83	$14.00	$16.05	$0.00	$80.88
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
TRAILERS FOR EARTH MOVING EQUIPMENT *TEAMSTERS JOINT COUNCIL NO. 10 ZONE B*	12/01/2021	$36.82	$13.41	$16.01	$0.00	$66.24
TUNNEL WORK - COMPRESSED AIR *LABORERS (COMPRESSED AIR)*	12/01/2021	$53.41	$9.10	$18.17	$0.00	$80.68
For apprentice rates see "Apprentice- LABORER"						
TUNNEL WORK - COMPRESSED AIR (HAZ. WASTE) *LABORERS (COMPRESSED AIR)*	12/01/2021	$55.41	$9.10	$18.17	$0.00	$82.68
For apprentice rates see "Apprentice- LABORER"						
TUNNEL WORK - FREE AIR *LABORERS (FREE AIR TUNNEL)*	12/01/2021	$45.48	$9.10	$18.17	$0.00	$72.75
For apprentice rates see "Apprentice- LABORER"						
TUNNEL WORK - FREE AIR (HAZ. WASTE) *LABORERS (FREE AIR TUNNEL)*	12/01/2021	$47.48	$9.10	$18.17	$0.00	$74.75
For apprentice rates see "Apprentice- LABORER"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
VAC-HAUL *TEAMSTERS JOINT COUNCIL NO. 10 ZONE B*	12/01/2021	$36.24	$13.41	$16.01	$0.00	$65.66
WAGON DRILL OPERATOR *LABORERS - ZONE 2*	12/01/2021	$35.66	$9.10	$16.64	$0.00	$61.40
	06/01/2022	$36.56	$9.10	$16.64	$0.00	$62.30
	12/01/2022	$37.41	$9.10	$16.64	$0.00	$63.15
	06/01/2023	$38.31	$9.10	$16.64	$0.00	$64.05
	12/01/2023	$39.21	$9.10	$16.64	$0.00	$64.95
For apprentice rates see "Apprentice- LABORER"						
WAGON DRILL OPERATOR (HEAVY & HIGHWAY) *LABORERS - ZONE 2 (HEAVY & HIGHWAY)*	12/01/2021	$35.66	$9.10	$16.64	$0.00	$61.40
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
WASTE WATER PUMP OPERATOR *OPERATING ENGINEERS LOCAL 4*	12/01/2021	$51.38	$14.00	$16.05	$0.00	$81.43
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
WATER METER INSTALLER *PLUMBERS & GASFITTERS LOCAL 12*	03/01/2021	$60.19	$13.57	$17.26	$0.00	$91.02
For apprentice rates see "Apprentice- PLUMBER/PIPEFITTER" or "PLUMBER/GASFITTER"						

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 00 73 73

STATUTORY REQUIREMENTS

Additional terms used in this section, if any, have the meanings stated below which are applicable to both the singular and plural thereof. This section includes certain provisions required by Laws and Regulations but does not represent or reflect all applicable provisions and policies or Laws and Regulations and may only include excerpts and portions thereof. Other required provisions and policies, and Laws and Regulations, shall be deemed to be so included and incorporated herein. Contractor is solely responsible to determine, obtain, review and interpret the full text of applicable provisions and policies, Regulations, and Laws.

Certain provisions of the Massachusetts General Laws ("MGL") are applicable to construction contracts including, but not limited to, MGL Chapters 30 and 149. All applicable provisions are hereby incorporated into the Contract as if fully set forth herein and shall prevail over any conflicting provisions of the Contract Documents.

The Contract is specifically subject to provisions applicable to contracts awarded pursuant to **MGL Chapter 30, Section 39M.**

MGL Chapter 30, *Section 39A, Construction contracts for public ways, airports or public works; truck rentals; security for payment*

MGL Chapter 149, *Section 29, Bonds for payment for labor, materials, rentals or transportation charges; enforcement of claim; notice of claim; speedy trial, appeal, consolidation; dismissal; legal fees; posting statute*

MGL Chapter 149, Section 29D, *Surety company; bonds*,

> "Every bid bond, every performance bond and every payment bond issued for any construction work in the commonwealth shall be the bond of a surety company organized pursuant to section 105 of chapter 175 or of a surety company authorized to do business in the commonwealth under the provisions of section 106 of said chapter 175 and be approved by the U.S. Department of Treasury and are acceptable as sureties and reinsurers on federal bonds under Title 31 of the United States Code, sections 9304 to 9308. "

MGL Chapter 30, Section 38A *Price adjustment clause in contracts for road, bridge, water and sewer projects awarded under Sec. 39M*

> See required calculations included in Section 00 73 10.

MGL Chapter 30, Section 39F, *Construction contracts; assignment and subrogation; subcontractor defined; enforcement of claim for direct payment; deposit, reduction of disputed amounts*

"These subparagraphs shall be binding between the general contractor and each subcontractor.

"(a) Forthwith after the general contractor receives payment on account of a periodic estimate, the general contractor shall pay to each subcontractor the amount paid for the labor performed and the materials furnished by that subcontractor, less any amount specified in any court proceedings barring such payment and also less any amount claimed due from the subcontractor by the general contractor.

"(b) Not later than the sixty-fifth day after each subcontractor substantially completes his work in accordance with the plans and specifications, the entire balance due under the subcontract less amounts retained by the awarding authority as the estimated cost of completing the incomplete and unsatisfactory items of work, shall be due the subcontractor; and the awarding authority shall pay that amount to the general contractor. The general contractor shall forthwith pay to the subcontractor the full amount received from the awarding authority less any amount specified in any court proceedings barring such payment and also less any amount claimed due from the subcontractor by the general contractor.

"(c) Each payment made by the awarding authority to the general contractor pursuant to subparagraphs (a) and (b) of this paragraph for the labor performed and the materials furnished by a subcontractor shall be made to the general contractor for the account of that subcontractor; and the awarding authority shall take reasonable steps to compel the general contractor to make each such payment to each such subcontractor. If the awarding authority has received a demand for direct payment from a subcontractor for any amount which has already been included in a payment to the general contractor or which is to be included in a payment to the general contractor for payment to the subcontractor as provided in subparagraphs (a) and (b), the awarding authority shall act upon the demand as provided in this section.

"(d) If, within seventy days after the subcontractor has substantially completed the subcontract work, the subcontractor has not received from the general contractor the balance due under the subcontract including any amount due for extra labor and materials furnished to the general contractor, less any amount retained by the awarding authority as the estimated cost of completing the incomplete and unsatisfactory items of work, the subcontractor may demand direct payment of that balance from the awarding authority. The demand shall be by a sworn statement delivered to or sent by certified mail to the awarding authority, and a copy shall be delivered to or sent by certified mail to the general contractor at the same time. The demand shall contain a detailed breakdown of the balance due under the subcontract and also a statement of the status of completion of the subcontract work. Any demand made after substantial completion of the subcontract work shall be valid even if delivered or mailed prior to the seventieth day after the subcontractor has substantially completed the subcontract work. Within ten days after the subcontractor

has delivered or so mailed the demand to the awarding authority and delivered or so mailed a copy to the general contractor, the general contractor may reply to the demand. The reply shall be by a sworn statement delivered to or sent by certified mail to the awarding authority and a copy shall be delivered to or sent by certified mail to the subcontractor at the same time. The reply shall contain a detailed breakdown of the balance due under the subcontract including any amount due for extra labor and materials furnished to the general contractor and of the amount due for each claim made by the general contractor against the subcontractor.

"(e) Within fifteen days after receipt of the demand by the awarding authority, but in no event prior to the seventieth day after substantial completion of the subcontract work, the awarding authority shall make direct payment to the subcontractor of the balance due under the subcontract including any amount due for extra labor and materials furnished to the general contractor, less any amount (i) retained by the awarding authority as the estimated cost of completing the incomplete or unsatisfactory items of work, (ii) specified in any court proceedings barring such payment, or (iii) disputed by the general contractor in the sworn reply; provided, that the awarding authority shall not deduct from a direct payment any amount as provided in part (iii) if the reply is not sworn to, or for which the sworn reply does not contain the detailed breakdown required by subparagraph (d). The awarding authority shall make further direct payments to the subcontractor forthwith after the removal of the basis for deductions from direct payments made as provided in parts (i) and (ii) of this subparagraph.

"(f) The awarding authority shall forthwith deposit the amount deducted from a direct payment as provided in part (iii) of subparagraph (e) in an interest-bearing joint account in the names of the general contractor and the subcontractor in a bank in Massachusetts selected by the awarding authority or agreed upon by the general contractor and the subcontractor and shall notify the general contractor and the subcontractor of the date of the deposit and the bank receiving the deposit. The bank shall pay the amount in the account, including accrued interest, as provided in an agreement between the general contractor and the subcontractor or as determined by decree of a court of competent jurisdiction.

"(g) All direct payments and all deductions from demands for direct payments deposited in an interest-bearing account or accounts in a bank pursuant to subparagraph (f) shall be made out of amounts payable to the general contractor at the time of receipt of a demand for direct payment from a subcontractor and out of amounts which later become payable to the general contractor and in the order of receipt of such demands from subcontractors. All direct payments shall discharge the obligation of the awarding authority to the general contractor to the extent of such payment.

"(h) The awarding authority shall deduct from payments to a general contractor amounts which, together with the deposits in interest-bearing accounts pursuant to subparagraph (f), are sufficient to satisfy all unpaid balances of demands for direct payment received from subcontractors. All such amounts shall be earmarked for such direct payments, and the subcontractors shall have a right in such deductions prior to any claims against such amounts by creditors of the general contractor."

MGL Chapter 30, Section 39G, *Completion of public works; semi-final and final estimates; payments; extra work; disputed items*

> Wherein Substantial Completion is defined as ". . . either that the Work has been completed except for Work having a valued at less than 1 percent of the then adjusted total Contract Price, or substantially all of the Work has been completed and opened to public use except for minor incomplete or unsatisfactory Work items that do not materially impair the usefulness of the Work as required by the Contract."

MGL Chapter 30, Section 39I, *Deviations from plans and specifications*
MGL Chapter 30, Section 39J, *Public construction contracts; effect of decisions of contracting body or administrative board*

MGL Chapter 30, Section 39L *Public construction work by foreign corporations; restrictions and reports*

MGL Chapter 30, Section 39M, *Contracts for construction and materials; manner of awarding* subsection (b)

> Regarding specifications ". . . specifications shall be written for full competition of each item of material . . ."

MGL Chapter 30, Section 39N *Construction contracts; equitable adjustment in contract price for differing subsurface or latent physical conditions*

> "If, during the progress of the work, the contractor or the awarding authority discovers that the actual subsurface or latent physical conditions encountered at the site differ substantially or materially from those shown on the plans or indicated in the contract documents either the contractor or the contracting authority may request an equitable adjustment in the contract price of the contract applying to work affected by the differing site conditions. A request for such an adjustment shall be in writing and shall be delivered by the party making such claim to the other party as soon as possible after such conditions are discovered. Upon receipt of such a claim from a contractor, or upon its own initiative, the contracting authority shall make an investigation of such physical conditions, and, if they differ substantially or materially from those shown on the plans or indicated in the contract documents or from those ordinarily encountered and generally recognized as inherent in work of the character provided for in the plans and contract documents and are of such a nature as to cause an increase or decrease in the cost of performance of the work or a change in the construction methods required for the performance of the work which results in an increase or decrease in the cost of the work, the contracting authority shall make an equitable adjustment in the contract price and the contract shall be modified in writing accordingly."

MGL Chapter 30, Section 39O, *Contracts for construction and materials; suspension, delay or interruption due to order of awarding authority; adjustment in contract price; written claim*

> "(a) The awarding authority may order the general contractor in writing to suspend, delay, or interrupt all or any part of the work for such period of time as it may determine to be appropriate for the convenience of the awarding authority; provided however, that if there is a suspension, delay or interruption for fifteen days or more or due to a failure of the awarding authority to act within the time specified in this contract, the awarding authority shall make an adjustment in the contract price for any increase in the cost of performance of this contract but shall not include any profit to the general contractor on such increase; and provided further, that the awarding authority shall not make any adjustment in the contract price under this provision for any suspension, delay, interruption or failure to act to the extent that such is due to any cause for which this contract provides for an equitable adjustment of the contract price under any other contract provisions.
>
> "(b) The general contractor must submit the amount of a claim under provision (a) to the awarding authority in writing as soon as practicable after the end of the suspension, delay, interruption or failure to act and, in any event, not later than the date of final payment under this contract and, except for costs due to a suspension order, the awarding authority shall not approve any costs in the claim incurred more than twenty days before the general contractor notified the awarding authority in writing of the act or failure to act involved in the claim."

MGL Chapter 30, Section 39P *Contracts for construction and materials; awarding authority's decisions on interpretation of specifications, etc.; time limit; notice*

MGL Chapter 30, Section 39R, *Definitions; contract provisions; management and financial statements; enforcement*

> "(1) The contractor shall make, and keep for at least six years after final payment, books, records, and accounts which in reasonable detail accurately and fairly reflect the transactions and dispositions of the contractor, and
>
> "(2) until the expiration of six years after final payment, the office of inspector general, and the commissioner of capital asset management and maintenance shall have the right to examine any books, documents, papers or records of the contractor or of his subcontractors that directly pertain to, and involve transactions relating to, the contractor or his subcontractors, and
>
> "(3) if the agreement is a contract as defined herein, the contractor shall describe any change in the method of maintaining records or recording transactions which materially affect any statements filed with the awarding authority, including in his description the date of the change and reasons therefor, and shall accompany said description with a letter from the contractor's independent certified public accountant approving or otherwise commenting on the changes, and

"(4) if the agreement is a contract as defined herein, the contractor has filed a statement of management on internal accounting controls as set forth in paragraph (c) below prior to the execution of the contract, and

"(5) if the agreement is a contract as defined herein, the contractor has filed prior to the execution of the contracts and will continue to file annually, an audited financial statement for the most recent completed fiscal year as set forth in paragraph (d) below.

"(c) Every contractor awarded a contract shall file with the awarding authority a statement of management as to whether the system of internal accounting controls of the contractor and its subsidiaries reasonably assures that:

"(1) transactions are executed in accordance with management's general and specific authorization;

"(2) transactions are recorded as necessary

"i. to permit preparation of financial statements in conformity with generally accepted accounting principles, and

"ii. to maintain accountability for assets;

"(3) access to assets is permitted only in accordance with management's general or specific authorization; and

"(4) the recorded accountability for assets is compared with the existing assets at reasonable intervals and appropriate action was taken with respect to any difference.

"Every contractor awarded a contract shall also file with the awarding authority a statement prepared and signed by an independent certified public accountant, stating that he has examined the statement of management on internal accounting controls, and expressing an opinion as to

"(1) whether the representations of management in response to this paragraph and paragraph (b) above are consistent with the result of management's evaluation of the system of internal accounting controls; and

"(2) whether such representations of management are, in addition, reasonable with respect to transactions and assets in amounts which would be material when measured in relation to the applicant's financial statements.

"(d) Every contractor awarded a contract by the commonwealth or by any political subdivision thereof shall annually file with the commissioner of capital asset management and maintenance during the term of the contract a financial statement prepared by an independent certified public accountant on the basis of an audit by such accountant. The final statement filed shall include the date of final payment. All statements shall be

accompanied by an accountant's report. Such statements shall be made available to the awarding authority upon request."

MGL Chapter 30, Section 39S, *Contracts for construction; requirements*

MGL Chapter 66 et seq, *Public Records*

MGL Chapter 149, Section 26, *Public works; preference to veterans and citizens; wages*
MGL Chapter 149, Section 27 *List of jobs; classification; schedule of wages; penalty; civil action*
MGL Chapter 149, Section 30, *Eight hour day and six day week; emergencies; work on highways*

MGL Chapter 149, Section 34, *Public contracts; stipulation as to hours and days of work; void contracts*

"Every contract, except for the purchase of material or supplies, involving the employment of laborers, workmen, mechanics, foremen or inspectors, to which the commonwealth or any county or any town, subject to section thirty, is a party, shall contain a stipulation that no laborer, workman, mechanic, foreman or inspector working within the commonwealth, in the employ of the contractor, sub-contractor or other person doing or contracting to do the whole or a part of the work contemplated by the contract, shall be required or permitted to work more than eight hours in any one day or more than forty-eight hours in any one week, or more than six days in any one week, except in cases of emergency, or, in case any town subject to section thirty-one is a party to such a contract, more than eight hours in any one day, except as aforesaid; provided, that in contracts entered into by the department of highways for the construction or reconstruction of highways there may be inserted in said stipulation a provision that said department, or any contractor or sub-contractor for said department, may employ laborers, workmen, mechanics, foremen and inspectors for more than eight hours in any one day in such construction or reconstruction when, in the opinion of the commissioner, public necessity so requires. Every such contract not containing the aforesaid stipulation shall be null and void."

MGL Chapter 149, *Section 34A, Contracts for public works; workers' compensation insurance; breach of contract; enforcement and violation of statute*

"Every contract for the construction, alteration, maintenance, repair or demolition of, or addition to, any public building or other public works for the commonwealth or any political subdivision thereof shall contain stipulations requiring that the contractor shall, before commencing performance of such contract, provide by insurance for the payment of compensation and the furnishing of other benefits under chapter one hundred and fifty-two to all persons to be employed under the contract, and that the contractor shall continue such insurance in full force and effect during the term of the contract. No officer or agent contracting in behalf of the commonwealth or any political subdivision thereof shall award such a contract until he has been furnished with sufficient proof of compliance with the aforesaid stipulations. Failure to provide and continue in force such insurance as aforesaid shall be deemed a material breach of the contract and shall operate as an immediate termination thereof. No cancellation of such insurance, whether by the insurer or by the insured, shall be valid unless written notice thereof is given by the party proposing

cancellation to the other party and to the officer or agent who awarded the contract at least fifteen days prior to the intended effective date thereof, which date shall be expressed in said notice. Notice of cancellation sent by the party proposing cancellation by registered mail, postage prepaid, with a return receipt of the addressee requested, shall be a sufficient notice. An affidavit of any officer, agent or employee of the insurer or of the insured, as the case may be, duly authorized for the purpose, that he has so sent such notice addressed as aforesaid shall be prima facie evidence of the sending thereof as aforesaid. This section shall apply to the legal representative, trustee in bankruptcy, receiver, assignee, trustee and the successor in interest of any such contractor. The superior court shall have jurisdiction in equity to enforce this section.

Whoever violates any provision of this section shall be punished by a fine of not more than one hundred dollars or by imprisonment for six months, or both; and, in addition, any contractor who violates any provision of this section shall be prohibited from contracting, directly or indirectly, with the commonwealth or any political subdivision thereof, for the construction, alteration, demolition, maintenance or repair of, or addition to, any public works or public building for a period of two years from the date of conviction of said violation."

MGL Chapter 149, Section 34B, *Contracts for public works; wages for reserve police officer*

"Every contract for the construction, alteration, maintenance, repair or demolition of, or addition to, any public works for the commonwealth or any political subdivision thereof shall contain stipulations requiring that the contractor shall pay to any reserve police officer employed by him in any city or town the prevailing rate of wage paid to regular police officers in such city or town."

MGL Chapter 62C, Section 49A *Certification of compliance with tax laws as prerequisite to obtaining license or governmental contract; confirmation of good tax standing; improper registration of motor vehicle in another state; misrepresentation on documents for purpose of evading payment of tax; appeal and hearing*

MGL Chapter 64H, Section 6, *Exemptions*
subsection (f) with regard to exemption from tax on building materials and supplies

MGL Chapter 82, *The Laying Out, Alteration, Relocation and Discontinuance Of Public Ways, And Specific Repairs Thereon, Section 40*

Section 40 Definitions
Section 40A Excavations; notice
Section 40B Designation of location of underground facilities
Section 40C Excavator's responsibility to maintain designation markings; damage caused by excavator
Section 40D Local laws requiring excavation permits; public ways

MGL Chapter 82A, *Excavation and Trench Safety*

Section 1 Unattended open trenches; safety hazards; rules and regulations; fines
Section 2 Trench excavating permits; permits issued by board or officer; certificate of insurance; fees
Section 3 Form of trench excavation permits; required statements
Section 4 Definitions
Section 5 Additional requirements

MGL Chapter 149

Section 6C Health and safety of general public and asbestos workers; rules and regulations
Section 18A Sanitary and safety conditions; tools
Section 18B Confined spaces; ventilation
Section 18C Power transmission equipment
Section 18D Ropes, hooks and cranes; use and operation
Section 18E Safety precautions in dangerous undertakings
Section 18F Explosives
Section 18G Industrial truck and internal combustion equipment
Section 129A Shoring Trenches for local governments

Massachusetts Department of Labor and Industries, Division of Occupational Safety (Chapter 454 CMR 10.00 et seq.)
Massachusetts Department of Public Safety "*Excavation and Trench Safety*" (Chapter 520 CMR 14.00 et seq.)

MGL Chapter 151B, *Unlawful Discrimination Because of Race, Color, Religious Creed, National Origin, Ancestry or Sex*
MGL Chapter 151E, *Prohibition Of Certain Discrimination By Businesses*

MGL Chapter 258, *Claims and Indemnity Procedure for the Commonwealth, its Municipalities, Counties and Districts and the Officers and Employees Thereof*

MGL Chapter 260, Section 2B *Tort Actions Arising from Improvements to Real Property*

MGL Chapter 266, Section 67A *Departments, agencies and public instrumentalities; false statements, etc. in procurement of supplies; penalty*
MGL Chapter 266, Section 67B, *Presentation of false claims*
MGL Chapter 266, Section 67C, *Capital facility construction projects, etc.; false entries in records; penalties*

END OF SECTION

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SECTION 01 11 00

SUMMARY OF WORK

PART 1 – GENERAL

1.01 SECTION INCLUDES

A. Project Description

B. Description of the Work

C. Work Sequence and Coordination

D. Special Requirements

E. Attachments

1.02 PROJECT DESCRIPTION

A. The Project is generally described as providing approximately 7,125 linear feet of 6-inch to 10-inch diameter ductile iron water main on Grove Street, Pleasant Street, Potter Avenue, Lincoln Avenue, Melcher Street, and Witherell Place, including new valves, hydrants, fittings, and appurtenances, replacement of water services, curb stops and curb boxes, temporary bypass piping, temporary and permanent hot-mix asphalt pavement, and all materials, equipment, services and construction inherent to the Work..

1.03 DESCRIPTION OF THE WORK

A. The Work includes labor, material and equipment, services required for construction, testing, and commissioning of the Project in accordance with the Contract Documents and as more specifically described in the Specifications and Drawings and includes, but is not limited to, the following principal features.

1. Furnish and install approximately 7,100 linear feet of 6-inch to 10-inch diameter cement lined ductile iron water mains and furnishing and installing related gate valves.

2. Furnish and install hydrants, including valves and hydrant laterals.

3. Furnish and install water services including corporations, copper tubing, curb stops and curb stop boxes.

4. Furnish and install temporary and permanent hot-mix asphalt trench pavement.

5. Furnish and install temporary bypass piping.

6. All labor, materials, tools, equipment and services inherent to construction of the Work.

B. Work Site locations: generally as shown on the Drawings.

C. Existing conditions and Site data: per the Drawings and Section 00 31 00.

1.04 WORK SEQUENCE AND COORDINATION

A. Sequence

1. Sequence Work to minimize shutdowns and reflect sequencing in the construction schedule.

B. Coordination

1. Ensure that facilities and water system flows are maintained and remain in service at all times unless otherwise approved.

   a. Obtain written approval of the Engineer for shutdowns. Notify Engineer a minimum of two weeks prior to any required shutdowns.

   b. Prepare a Shutdown Plan for each requested shutdown indicating what existing valves must be operated by Owner personnel during the shutdown.

   c. Coordinate Work with the City and provide public notice, as required by the Owner.

2. Maintain access to facilities for the Owner throughout the Project.

3. Maintain access to businesses and residences during execution of the Work.

1.05 SPECIAL REQUIREMENTS

A. Coordinate with Owner and Engineer for and provide public notification on the Project as specified below.

1. Notification to Owner and Engineer no less than 30 days prior to beginning Work in a new area of the Project to allow for Owner and Engineer to complete pre-Project notification to residents.

2. Notification to residents who will experience an interruption in water service, no less than 48 hours prior to interruption in water service. See Interruption Notification attached to this section.

3. Notification to residents who will be connected to the temporary bypass system, no less than 24 hours prior to connection to temporary bypass. See Bypass Notification attached to this section.

1.06 ATTACHMENTS

A. Water Service Interruption Notification

B. Temporary Bypass Notification

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

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Water Service Interruption Notification Text

WATER SERVICE INTERRUPTION

The [INSERT OWNER NAME] is completing repairs on the distribution system in this area. As a result of the Work on this Project, your water service will be disrupted on _____, _____ starting at _____ for approximately _____ hours. Please make any necessary arrangements as you may be without water during this period. When your water service is restored, it is recommended that you clean removable aerators or faucet screens, if present, and run an interior cold and an outside faucet for several minutes. If you experience discolored water even after flushing for several minutes, please run your outside faucet until the water runs clear. If you have any questions, please contact the [INSERT CITY/TOWN] [Department of Public Works] at [phone number]. Thank you for your cooperation with these essential repairs.

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Temporary Water Bypass Notification Text:

TEMPORARY WATER SYSTEM CONNECTION NOTICE

The [INSERT OWNER NAME] is completing repairs on the distribution system in this area. As a result of the work on this project, the City will supply your water through a temporary bypass system for the duration of the work. In order to complete the temporary bypass connection, the [INSERT CITY/TOWN] Contractor will need to access you water meter between _____, 20___ and _____, 20___. Please contact the Contractor's Office at [Phone Number] to schedule this service.

Once you are connected to the temporary bypass system, your water will operate as normal. Should you experience issues with the temporary water system, please contact the [INSERT CITY/TOWN] [Department of Public Works] at [Phone Number]. If you experience an unexpected interruption in water service, please contact the Contractor's emergency response personnel:

1. [Name of Emergency Contact 1] at [Phone Number]
2. [Name of Emergency Contact 2] at [Phone Number]
3. [Name of Emergency Contact 3] at [Phone Number]

Thank you for your cooperation with these essential repairs.

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SECTION 01 15 30

PAYMENT AND ADMINISTRATIVE PROCEDURES AND QUALITY REQUIREMENTS

PART 1 – GENERAL

1.01 SUMMARY

A. This Section specifies administrative and procedural requirements relating to payment, the process of contract administration, and the methods of communicating, controlling, and assuring quality. This Section applies to all Specifications and Drawings.

B. Certain provisions required by Laws and Regulations may be referenced. Contractor is responsible to determine and obtain applicable Laws and Regulations and to review and interpret the full text of such Laws and Regulations.

C. Section Includes

1.02 PAYMENT PROCEDURES
Schedule of Values
Payment Procedures
Change Procedures
Measurement and Payment Procedures
Correlation of Submittals

1.03 ADMINISTRATIVE REQUIREMENTS
Project Management and Coordination; Meetings
Documentation of Progress
Submittal Procedures

1.04 QUALITY REQUIREMENTS
Reference Standards and Regulatory Requirements

1.02 PAYMENT PROCEDURES

A. Schedule of Values: in accordance with Article 2 of the Standard General and Supplementary Conditions, if any.

1. Provide sufficient detail to allow for determination of the value of the Work at any degree of completion.

2. For each line item, identify number and title of Specification section in accordance with the Table of Contents.

3. The unit price breakdown included in the Bid Form [OR Unit Prices Form] will constitute the preliminary Schedule of Values for this Project.

4. Number of hardcopies: **4**

5. Submit electronically via web-based electronic document management control system in PDF format.

B. Payment Procedures**:** in accordance with Article 14 of Standard General and Supplementary Conditions, if any.

1. Submit Application for Payment using the form included in the Project Forms section. Utilize latest approved Schedule of Values for listing items in Application for Payment. Provide supporting documentation for items included in the Application for Payment.

   a. Number of hardcopies: 4

   b. Submit electronically via web-based electronic document management control system in PDF format.

2. Payment Period: at intervals stipulated in the Agreement.

3. Submit an updated Progress Schedule with each Application for Payment.

4. Submit the following items for the Project.

   a. Copy of cashed check paid and copy of receipts for Traffic Police Details invoices paid showing: the Project name; the officers' names; location of assignment; date of assignment; hours of assignment; and number of hours being invoiced

C. Change Procedures: in accordance with Articles 10 and 12 of Standard General and Supplementary Conditions, if any, utilizing forms included in Section 00 60 00 Project Forms.

Number of hardcopies: 4

Submit electronically via web-based electronic document management control system in PDF format.

1. Field Order: as authorized by Paragraph 9.04 of the Standard General and Supplementary Conditions, if any.

2. Change Request: issued by Engineer, Owner or Contractor to request or authorize minor variations and deviations, amendments or supplements to the Contract Documents. Initiate requests for substitute items per Paragraph 6.05 of the Standard General and Supplementary Conditions, if any, using a Change Request.

   a. Engineer or Owner to include a detailed description of a proposed change with supplementary or revised Drawings and Specifications, including a change in Contract Times related to the change (with a stipulation for any overtime work required) and the period of time during which the requested price (if any) will be considered valid. Prepare and submit an estimate within 15 days.

   b. Describe the proposed change and its full effect on the Work. Describe the reason for the change and the effect on the Contract Price and Contract Time with full documentation (and a statement describing the effect on Work by separate or other contractors).

3. Work Change Directive: as defined in subparagraph 1.01.A.51 of the Standard General and Supplementary Conditions, if any.

4. Change Order: in accordance with Articles 10 and 12 of the Standard General and Supplementary Conditions, if any.

   a. *Stipulated Price Change Order*: based on Contractor's maximum price quotation or Contractor's request for a Change Order as approved by Engineer or Owner.

   b. *Unit Price Change Order*: for pre-determined unit prices and quantities and executed on a fixed unit price basis. Execute Work under a Work Change Directive for unit costs or quantities of Work not pre-determined. Changes in Contract Price and Contract Time to be computed as specified for Time and Material Change Order.

c. *Time and Material Change Order*: based on itemized account and supporting data after completion of change within time limits indicated in the Standard General and Supplementary Conditions, if any. Engineer or Owner and Contractor to determine the change allowable in Contract Price and Contract Time as provided in the Standard General and Supplementary Conditions, if any. Maintain detailed records of Work completed on this basis, provide provide full information for evaluation of proposed changes, and substantiate costs for changes in the Work.

5. "Or Equals" and Substitutes: Request "Or-Equal" and substitute iitems as a Change Request per subparagraph 1.02.C.2 above, with complete data substantiating compliance with Contract Documents.

a. Or-Equal" and substitute items will be processed in accordance with Paragraph 6.05 of the Standard General and Supplementary Conditions, if any, and subparagraph 1.03.C.6 below.

D. Measurement and Payment Procedures

1. Payment includes full compensation for required labor, material and equipment, tools, plant, transportation, services and incidentals; erection, application or installation and construction of an item of the Work; and overhead and profit, unless otherwise indicated.

2. See Section 01 20 25 Measurement and Payment.

E. Correlation of Submittals

1. Promptly revise Schedule of Values and Applications for Payment to record each authorized Change Order as a separate line item and adjust the Contract Price.

2. Promptly revise Progress Schedule to reflect any change in Contract Times and revise sub-schedules to adjust time for other items of the Work affected by the change.

3. Promptly enter changes in Project record documents.

1.03 ADMINISTRATIVE REQUIREMENTS

A. Project Management and Coordination; Meetings

1. Contact information for Owner and other entities related to the Project and special coordination requirements and contacts during prosecution of the Work will be provided at the Preconstruction Conference and Site Mobilization Meeting.

2. Inform Owner and Engineer of the address for sending official correspondence and the address and telephone number of Contractor's representative who will be project manager and Site superintendent for the Contract.

3. During periods of construction and testing keep Owner and Engineer informed in writing with name, address, and telephone number of Contractor's representative who will be responsible and available outside of normal working hours for emergency repairs and the maintenance of safety devices.

4. Identify the 24 hour, 7 days per week emergency response telephone or cell phone number that is staffed by a person (not a passive answering machine) or provide that a phone call will be returned within one hour.

5. Identify correspondence, submittals, drawings, data and materials, packing slips or other items associated with this Contract as follows.

   Grove Street & Pleasant Street Watermain Replacement

6. Coordinate scheduling, submittals, and Work of the various Specifications to effectuate an efficient and orderly sequence for installing interdependent construction elements, with provisions for accommodating items installed later.

7. Preconstruction Conference and Site Mobilization Meeting

   a. Owner to schedule an initial preconstruction conference in accordance with Paragraph 2.06 of the Standard General and Supplementary Conditions, if any.

   b. Attendance required by Owner, Contractor, Engineer, Contractor's Superintendent, Project Manager, and Subcontractors as a minimum.

   c. Sample Agenda

      - Distribute Contract Documents
      - Discuss design concepts
      - Discuss preliminary Progress Schedule, Schedule of Submittals, Schedule of Values and preliminary cash flow projections.
      - Designate personnel representing each party; communication procedures
      - Procedures and processing of submittals, substitutions, applications for payments, Change Orders and Contract closeout procedures
      - Scheduling
      - Use of premises by Owner and Contractor
      - Owner's requirements and partial occupancy

- Construction facilities and controls provided by Owner
- Temporary utilities provided by Owner and Contractor
- Survey and Site Layout
- Security and housekeeping procedures
- Schedules
- Procedures for testing
- Procedures for maintaining record documents
- Requirements for start-up
- Inspection and acceptance of equipment put into service during construction period
- Access, laydown and coordination with others

d. Engineer will record minutes and distribute draft copies promptly after meeting to Owner and Contractor for review, then revise as required and distribute thereafter to meeting participants, with copies to Owner and Contractor, and those affected by decisions made.

8. Progress Meetings

a. Owner to schedule progress meetings beginning no later than 60 days after the Initial Conference and continue thereafter on a monthly basis throughout progress of the Work.

b. Attendance required by Contractor, Contractor's Superintendent, major Subcontractors and Suppliers, Owner and Engineer as appropriate to agenda topics for each meeting.

c. Sample Agenda

- Review minutes of previous meetings – unresolved issues
- Overall project status
- Work Completed
- Anticipated Work
- Schedule
- Pay Applications
- Change Orders
- Submittals
- Observations, problems, and decisions
- General Discussion/Comments
- Action Items
- Date and time for next meeting

d. Engineer will record minutes and distribute draft copies promptly after meeting to Owner and Contractor for review, then revise as required and distribute thereafter to meeting participants, with copies to Owner and Contractor, and those affected by decisions made.

9. Pre-installation Conference and Coordination Meetings

   a. When required, convene a pre-installation conference at Site before commencing certain Work that requires coordination or has special requirements or approval.

   b. Convene coordination meetings as may be generally required.

   c. Attendance required by parties directly affecting, or affected by, Work of the specific Specification section.

      1) For pre-installation conference, notify Owner and Engineer 5 days in advance.

      2) For coordination meetings, party requesting coordination meeting to notify other party(s).

   d. Review conditions, preparation and procedures, and coordination with related Work.

B. Documentation of Progress

1. Submit preliminary and final Progress Schedules as specified in Paragraphs 2.05 and 2.07 of the Standard General and Supplementary Conditions, if any, or as established in Notice to Proceed.

   Number of hardcopies: 4

   Submit electronically via web-based electronic document management control system in PDF format.

   a. Show complete sequence of construction by activity, identifying Work of separate stages and other logically grouped activities. Indicate the early and late start, early and late finish, float dates, and duration.

   b. Indicate estimated percentage of completion for each item of Work at each submission.

   c. Indicate dates for fabrication, factory testing, delivery, shipping and field testing, and material and equipment delivery dates, including those furnished by Owner. Coordinate with Schedule of Submittals.

2. Submit revised Progress Schedule on monthly basis and with each Application for Payment, identifying changes since previous version. Coordinate content with Schedule of Values, if any.

3. Documentation of Pre-Construction Conditions, Construction Progress, and Final Conditions

   a. Documentation of Pre-Construction Conditions

      1) Digital video record, in color, all areas of the Project Site. Ensure existing conditions that might be affected by the Work are clearly recorded.

      2) Arrange for video recordings to be conducted by a professional videographer in full high definition format (FHD) with 1080p resolution. Include clear and concise audio descriptions of the existing Project Site conditions with date, time, orientation and Project identification.

      3) Submit 1 copy of the first completed video recording to the Engineer for review of visual and audio quality. Re-record any recording furnished which, in the opinion of the Engineer, are poor quality or incomplete at no additional cost to Owner.

      4) Submit 2 copies of approved videos on a flash drive or USB stick.

   b. Documentation of Construction Progress: not required for the Project.

   c. Documentation of Final Conditions

      1) Submit digital video record in in full high definition format (FHD) with 1080p resolution, of final conditions of all areas of the Project Site with Application for Final Payment payment to record final conditions. Include clear and concise audio descriptions of the Project Site conditions with date, time, orientation and Project identification.

      2) Submit 1 copy of the first completed video recording to the Engineer for review of visual and audio quality. Re-record any recording furnished which, in the opinion of the Engineer, are poor quality or incomplete at no additional cost to Owner.

      3) Submit 2 copies of approved videos on a flash drive or USB stick.

4. Reports

   a. Submit weekly Safety Reports signed by the Safety Representative.

   b. Other reports to be submitted:

      1) Daily quantity sheet for payment items

      2) Updates to the Construction Operations Plan approved pursuant to SC 2.07 of Section 00 73 10 when it is modified

   Number of hardcopies: 0

   Submit electronically via web-based electronic document management control system in PDF format.

C. Submittal Procedures

1. Schedule submittals to expedite the Project and coordinate with schedules required by Paragraph 1.03.B above. Deliver each submittal in the quantity and electronic form indicated to Engineer (with copy to Owner where required) at the addresses specified below. Coordinate submission of related items.

   Engineer:

   Woodard & Curran
   40 Shattuck Road, Suite 110, Andover, MA 01810
   Attn: Jenna O'Connell
   Telephone: (781) 613-0326
   Email: joconnell@woodardcurran.com

   Owner:

   Town of Plainville, MA
   Plainville Department of Public Works
   171 East Bacon Street
   Plainville, MA 02762
   Attn: Dennis Morton
   Phone: 508-695-6871
   Email: dmorton@plainville.ma.us

2. Present submittals in a clear and thorough manner, in English and using English units. Provide space for Contractor, Engineer, and Owner's review stamps. Use sheet size of not less than 8 1/2 by 11 inches and not more than 24 by 36 inches.

3. Revise and resubmit documents as required. Identify all changes made since previous submittal. Distribute copies of reviewed submittals to concerned parties. Instruct parties to promptly report any inability to comply with provisions. Submittals not requested on the submittal schedule may not be recognized or processed.

4. Submit preliminary and final Schedule of Submittals as specified in Article 2 of the Standard General and Supplementary Conditions, if any, or as established in Notice to Proceed. Include all submittals specified in the Standard General and Supplementary Conditions, if any, General Requirements, and other Specification sections.

   Number of hardcopies: 2

   Submit electronically via web-based electronic document management control system in PDF format.

   a. Include description of each submittal, date by which each submittal will be delivered to Engineer and Owner date by which each submittal must be approved to maintain project schedule, and relevant section reference.

   b. Allow 10-15 days from receipt of submittal/resubmittal for Engineer review of submittals and possible resubmittal.

5. Shop Drawings and Samples: Submit in accordance with Paragraph 6.17 of the Standard General and Supplementary Conditions, if any, and as follows, and coordinate with the Schedule of Submittals required in subparagraph 4 above.

   Number of hardcopies: 2

   Submit electronically via web-based electronic document management control system in PDF format.

   a. Complete a Submittal Transmittal (Form 00 62 11) as is indicated, numbering each submittal consecutively. Assign resubmittals the same Transmittal number as the original with a suffix of a sequential letter to indicate the resubmittal (e.g. the first resubmittal of submittal 25 would be number 25A.) Include only those documents previously issued under original Submittal Transmittal number in resubmittals. Do not combine new submittals with resubmittals.

b. Attach a Submittal Transmittal to each group of Shop Drawings, manufacturer's literature, equipment data and Samples submitted. Use a sufficient number of Submittal Transmittal forms so that: items on a single Submittal Transmittal form pertain to the same equipment item, Specification section or element of Work; items on a single Submtital Transmittal form are either original submittals or the same number resubmittal; and each Sample is listed on a separate Submittal Transmittal form.

c. Submittals which do not have a fully completed Submittal Transmittal form will be returned along with unreviewed attachments. Returned submittals, even though incomplete, will be counted as a submittal.

d. Submission of any Shop Drawing or Sample bearing Contractor's and Engineer's approval shall constitute a representation to Owner that the requirements of Paragraph 6.17 of the Standard General and Supplementary Conditions, if any, have been fulfilled.

e. Engineer to complete review in accordance with Paragraph 6.17.D. of the Standard General and Supplementary Conditions, if any.

6. Variations: Identify variations from Contract Documents and material and equipment or system limitations which may be detrimental to successful performance of the completed Work and identify reasons therefor in accordance with subparagraph 6.17.C.3 of the Standard General and Supplementary Conditions, if any.

   a. Clearly identify requests for “Or-Equal” and substitute items and submit per Paragraph 6.05 of Standard General and Supplementary Conditions, if any, and subparagraph 1.02.C.5 above. Substitute items will not be considered when indicated or implied on Shop Drawing or material and equipment data submittals without separate written request, or when acceptance will require revision to the Contract Documents.

7. Manufacturers' Installation Instructions and Certificates: Submit printed instructions for delivery, storage, assembly, installation, start-up, adjusting, and finishing.

   Number of hardcopies: 2

   Submit electronically via web-based electronic document management control system in PDF format.

   a. Indicate special procedures, perimeter conditions requiring special attention and special environmental criteria required for application or installation.

b. Submit manufacturers' certificates for recent or previous test results on material or equipment, but they must be acceptable to Engineer and Owner. Indicate material or equipment conforms to or exceeds specified requirements and provide supporting reference date, affidavits, and certifications as appropriate.

c. Submit test results, data, and reports and certifications to Engineer based on tests performed. Submit test reports and certifications for independent testing services specified.

8. Record Documents and Closeout Submittals: submit in accordance with Paragraph 6.12 of the Standard General and Supplementary Conditions, if any

a. Legibly mark each item to record description of actual equipment and material installed and actual construction on the Drawings and approved submittals, including the following.

1) Manufacturer's name and equipment and material model and number

2) Material and equipment substitutions or alternates utilized

3) Approved changes

4) Measured depths of foundations

5) Measured horizontal and vertical locations of Underground Facilities and appurtenances, referenced to permanent surface improvements

6) Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work

7) Field changes of dimension and detail

8) Details not on original Contract Documents or Shop

b. *As-Builts for Material and Equipment*

Number of prints: **3**

Electronic format:.DWG

Submit electronically on a flash drive or USB stick.

Indicate "As-Supplied" in revision block and sign. Show all changes and revisions to Final Completion. Include with subparagraph d. Operation and Maintenance Data per Part 2 below

c. *Drawings Conformed by Contractor to Construction Records*: Submit the following.

Number of prints: **3**

Electronic format: DWG

Submit electronically on a flash drive or USB stick.

Indicate "Conformed by Contractor to Construction Records" in revision block and sign. Show all changes and revisions to Final Completion.

d. *Warranties and Guarantees*: Submit duplicate notarized copies of warranty documents which are executed and transferable from Subcontractors, Suppliers, and manufacturers. For items of Work delayed beyond date of Substantial Completion, provide updated submittal within 10 days after acceptance, listing date of acceptance as start of Warranty Period.

1) Submit in searchable PDF format via digital document exchange system.

2) Submit 3 copies in ring binders with durable plastic covers and table of contents.

e. *Operation and Maintenance Data*

1) Submit draft of completed volumes 30 days prior to equipment startup. Revise content of all sets as required prior to final submission.

Number of hardcopies: **3**

Submit in searchable PDF format via web-based electronic document management control system in PDF format

2) Submit final volumes within 10 days after final inspection. Submit in searchable PDF format via web-based electronic document management control system in PDF format

1.04 QUALITY REQUIREMENTS

A. Reference Standards and Regulatory Requirements

1. Reference to standards, specifications, manuals or codes of any technical society, organization or association, or Laws or Regulations of any governmental authority are used in accordance with Paragraph 3.02 of the Standard General and Supplementary Conditions, if any.

2. Acronyms and abbreviations used are defined in the applicable versions of the Encyclopedia of Associations published by Gale (part of Cengage Learning) generally available in large libraries and on the internet.

3. Specific requirements applicable to the Project include the following.

   a. Pursuant to Paragraph 3.02 of the Standard General Conditions and SC-3.02 of Section 00 73 10, reference to standards, specifications, manuals, or codes of any technical society, organization, or association, whether such reference be specific or by implication, shall mean the standard, specification, manual, code in effect at the time of opening of Bids.

   b. Comply with the Massachusetts Department of Transportation - Highway Division's (referred to as "MassDOT") Standard and Supplemental Specifications (but not including Compensation sections), Construction Details (including Standard Drawings), and Design Guides as incorporated into the Specifications and Drawings, and as may be modified therein or superseded by the Owner's requirements through the direction of the Engineer. Specific sections of the MassDOT documents are referenced in the Specifications and Drawings. References to "Department" in the MassDOT documents shall mean Owner or Resident Project Representative for this Project. See MassDOT Highway Division website for latest documents.

https://www.mass.gov/massdot-highway-division-manuals-and-publications

END OF SECTION

SECTION 01 20 25

MEASUREMENT AND PAYMENT

PART 1 - GENERAL

1.01 DESCRIPTION

A. This Section describes the measurement and payment for the Work to be completed under each item in Section 00 43 22 Unit Prices Form, which may also be referred to as "pay item".

B. Payment procedures are in accordance with the Agreement, Article 14 of the General Conditions, the Supplementary Conditions (if any), and the General Requirements.

C. Measurement: as determined, verified, or approved by Engineer or Owner in accordance with Paragraph 11.03 of the General Conditions, the Supplementary Conditions (if any), and the General Requirements, except as otherwise specified.

D. The Work described in each pay item shall be as described in the Specifications and shown on the Drawings and not included in other pay items.

1. Pay item descriptions are general and may not specifically describe all associated Work or elements thereof, do not constitute Specifications, and do not supersede the content of the Specifications and Drawings.

2. Review the Specifications and Drawings for Work associated with each pay item. Claims for being unfamiliar with the content of the Specifications and Drawings will not be considered.

E. The following Work is not specifically described or designated as a pay item, is considered incidental to all pay items, and shall not be measured separately for payment.

1. Division 01 General Requirements EXCEPT those items included in Mobilization/Demobilization and included as a separate pay item.

2. Materials, equipment, and services necessary to verify existing field conditions and the location, size, type, material, and orientation of existing pipes and utilities shown on the Drawings excluding test pits.

3. Restoration of all areas disturbed by the Contractor within the limits of Work, including planting.

4. Field and laboratory testing and reporting by independent laboratory, including but not limited to compaction of backfill materials; aggregate gradation; and concrete testing

5. Traffic controls, except arrow boards.

F. Payment will not be made for restoration of areas disturbed by the Contractor outside the limits of Work.

G. Payment will only be made for those utility services, including water and fire services, specifically identified for replacement on the Drawings. Relocation or replacement for the Contractor's convenience or due to breakage by the Contractor of any other utility services shown on the Drawings, or at locations which could reasonably be assumed, shall be at no cost to Owner.

H. Design, installation and removal of excavation support systems, temporary and permanent utility/structure support systems associated with a pay item shall be considered incidental to that pay item.

I. Additional dewatering and erosion control (including installation, operation, maintenance, removal and off-Site disposal of erosion control devices) associated with a pay item shall be considered incidental to that pay item.

J. Pay items identified as Owner's Contingency will be processed per the Agreement.

K. Police details will be direct billed by the police department to Owner. Provide daily detail slips to the Engineer. Police details scheduled and not used by the Contractor will be back-charged to Contractor.

L. Rentals of construction equipment and machinery and the parts thereof whether rented from Contractor or others in accordance with rates published in current edition of the Rental Rate Blue Book® for construction equipment published by EquipmentWatch® (www.equipmentwatch.com). When Contractor-owned equipment is ordered by Owner or Engineer to be held at standby, equipment rental rates shall be 50% of normal rate. Rental or standby shall not include time that equipment is inoperative because of malfunction or breakdown and shall cease when the use thereof is no longer necessary for the Work.

1.02 MEASUREMENT AND PAYMENT BASIS

ITEM 1: Mobilization/Demobilization	
Measurement	Portion of Work completed and accepted
Payment	Lump Sum. **Item 1 not to exceed 5% of total sum of Items 2.a. through 20.**
Schedule of Payment	50% at Project commencement, 25% at Substantial Completion; 25% at Final Completion
Includes delivery to and removal of equipment from the Project Site, temporary utilities, facilities and controls, obtaining necessary permits including associated fees, insurance and bond costs, signage, development of pre-construction schedules and plans required by the General Conditions, Supplementary Conditions and General Requirements; necessary pre-construction investigations, verifying existing field conditions, coordination, and Site clean-up, restoration and closeout. Note: Owner will waive fees associated with [road opening and trench] permits and costs for these permits shall not be included in this item. Do not include police details direct billed to Owner.	

ITEM 2A: 12-inch Cement Lined Ductile Iron Pipe **ITEM 2B: 10-inch Cement Lined Ductile Iron Pipe** **ITEM 2C: 8-inch Cement Lined Ductile Iron Pipe** **ITEM 2D: 6-inch Cement Lined Ductile Iron Pipe**	
Measurement	As measured along the horizontal projection of the centerline of the pipe; for water main replacement, measure from and to the face of water main fittings and valves.
Payment	Unit price per linear foot of pipe installed for water main replacement, complete in place.
Schedule of Payment	Monthly based on quantity installed, tested and accepted.
Material, tools, equipment, services, installation, and construction inherent to the Work for cement lined, ductile iron pipe complete in place including: barricades, barrels, and devices necessary for traffic control, preparation and protection; erosion control, site clearing, saw cutting, capping existing water mains, joint restraints, excavation; stability of excavations; dewatering; connecting to existing water mains (as applicable); backfill and fill; bedding and cover for pipe; crossing of underground utilities; support and backfill of existing utilities; compaction; grading; and maintenance; disposal of excess excavated materials; removal and disposal of pavements, site restoration and other incidental Work necessary to furnish and install pipe as specified, shown on the Drawings and required by field conditions.	

ITEM 3A: 12-inch Gate Valve, Valve Box and Cover **ITEM 3B: 10-inch Gate Valve, Valve Box and Cover** **ITEM 3C: 8-inch Gate Valve, Valve Box and Cover** **ITEM 3D: 6-inch Gate Valve, Valve Box and Cover**	
Measurement	Number of units installed
Payment	Unit price each
Schedule of Payment	Monthly based on quantity installed, tested and accepted
Material, tools, equipment, services, installation, and construction inherent to the Work for gate valves, valve boxes and covers complete in place including: barricades, barrels and devices necessary for traffic control, preparation and protection; erosion control, site clearing, saw cutting, gaining control of existing water system, joint restraints, excavation; stability of excavations; dewatering; connecting to existing water mains (as applicable); backfill and fill; bedding and cover; crossing of underground utilities; support and backfill of existing utilities; compaction; grading; and maintenance; disposal of excess excavated materials; removal and disposal of pavements, site restoration and other incidental Work necessary to furnish and install valves and valve boxes as specified, shown on the Drawings and required by field conditions.	

ITEM 4A: 12-inch x 12-inch x 8-inch Cement Lined Ductile Iron Anchor Tee **Item 4B: 12-inch x 12-inch x 6-inch Cement Lined Ductile Iron Anchor Tee** **ITEM 4C: 10-inch x 10-inch x 8-inch Cement Lined Ductile Iron Anchor Tee** **ITEM 4D: 10-inch x 10-inch x 6-inch Cement Lined Ductile Iron Anchor Tee** **ITEM 4E: 8-inch x 8-inch x 8-inch Cement Lined Ductile Iron Tee** **ITEM 4F: 8-inch x 8-inch x 6-inch Cement Lined Ductile Iron Anchor Tee**	
Measurement	Number of units installed.
Payment	Unit price per each
Schedule of Payment	Monthly based on quantity installed, tested and accepted
Material, tools, equipment, services, installation, and construction inherent to the Work for tapping sleeves and valves and cement lined ductile iron tees complete in place including: barricades, barrels and devices for traffic control; preparation and protection; erosion control, site clearing, saw cutting, gaining control of existing water system, joint restraints, excavation; stability of excavations; dewatering; connecting to existing water mains (as applicable); backfill and fill; bedding and cover; crossing of underground utilities; support and backfill of existing utilities; compaction; grading; and maintenance; disposal of excess excavated materials; removal and disposal of pavements, site restoration and other incidental Work necessary to furnish and install tapping sleeves and valves and tees.	

ITEM 5A: 8-inch Cement Lined Ductile Iron Cap **ITEM 5B: 6-inch Cement Lined Ductile Iron Cap** **ITEM 5C: 8-inch 45 Degree Cement Lined Ductile Iron Bend** **ITEM 5D: 8-inch 22.5 Degree Cement Lined Ductile Iron Bend** **ITEM 5E: 8-inch 11.25 Degree Cement Lined Ductile Iron Bend**	
Measurement	Number of units installed
Payment	Unit price each
Schedule of Payment	Monthly based on quantity installed, tested and accepted
Material, tools, equipment, services, installation, and construction inherent to the Work for cement lined ductile iron reducers, caps and bends complete in place including: barricades, barrels and devices necessary for traffic control, preparation and protection; erosion control, site clearing, saw cutting, joint restraints; excavation; stability of excavations; dewatering; connecting to existing water mains (as applicable); backfill and fill; bedding and cover; crossing of underground utilities; support and backfill of existing utilities; compaction; grading; and maintenance; disposal of excess excavated materials; removal and disposal of pavements, site restoration and other incidental Work necessary to furnish and install reducers, caps and bends as specified, shown of the Drawings and required by field conditions.	

ITEM 6A: 10-inch Solid Sleeve **ITEM 6B: 8-inch Solid Sleeve** **ITEM 6C: 12-inch x 10-inch Reducer**	
Measurement	Number of units installed
Payment	Unit price each
Schedule of Payment	Monthly based on quantity installed, tested and accepted
Material, tools, equipment, services, installation, and construction inherent to the Work for solid sleeves complete in place including: barrels, barricades and devices necessary for traffic control; preparation and protection; erosion control, site clearing, saw cutting, joint restraints; excavation; stability of excavations; dewatering; connecting to existing water mains (as applicable); backfill and fill; bedding and cover; crossing of underground utilities; support and backfill of existing utilities; compaction; grading; and maintenance; disposal of excess excavated materials; removal and disposal of pavements, site restoration and other incidental Work necessary to furnish and install solid sleeves.	

ITEM 7: Hydrants	
Measurement	Number of units installed
Payment	Unit price each
Schedule of Payment	Monthly based on quantity installed, tested and accepted
Material, tools, equipment, services, installation, and construction inherent to the Work for fire hydrants complete in place including: barrels, barricades and devices necessary for traffic control; preparation and protection; erosion control, site clearing, saw cutting, joint restraints, couplings; excavation; stability of excavations; dewatering; offsets and extensions, connection to hydrant lateral; backfill and fill; bedding and cover; crossing of underground utilities; support and backfill of existing utilities; compaction; grading; and maintenance; bearing stone, crushed stone dry well, roofing felt, setting vertical and horizontal alignment, disposal of excess excavated materials; removal and disposal of pavements, site restoration and other incidental Work necessary to furnish and install hydrants as specified, shown on the Drawings and required by field conditions.	

ITEM 8: Disinfection and Pressure Testing	
Measurement	Percent of total installed water main, tested and accepted
Payment	Lump Sum
Schedule of Payment	Monthly based on progress, tested and accepted
Materials, tools, equipment and services inherent to the Work for pressure testing, disinfection, sampling, and bacteria testing water mains in accordance with the Specifications and AWWA C651, complete in place, including: providing temporary blow-off/sample lines including corporations, tubing and stops; initial flushing; pumps, gauges, and hydrostatic testing; chlorination, flushing chlorinated water, neutralizing flushed chlorinated water, sampling for bacteria testing, bills of lading and sample delivery, water quality analysis by certified laboratory; submitting analysis results to Engineer and Owner and removing blow off/sample line to corporation; and other Work necessary to pressure test, chlorinate and bacteria test water mains in accordance with the Specifications and requirements of AWWA C651. Excludes work associated with disinfection, hydrostatic tests and water quality tests that fail to produce satisfactory results and hydrostatic tests performed by Contractor for his/her convenience. Contractor shall be responsible for costs associated with flushing, chlorinating, hydrostatic testing, neutralizing chlorine, sampling and water quality testing that produce unsatisfactory results.	

ITEM 9A: 1-inch Type K Copper Tubing (Corporation to Curb Stop) ITEM 9B: 2-inch Type K Copper Tubing (Corporation to Curb Stop)	
Measurement	As measured along the horizontal projection of the centerline of the tubing; measured from the face of corporation to the face of curb stop.
Payment	Unit price per linear foot
Schedule of Payment	Monthly based on quantity installed, tested and accepted
Material, tools, equipment, services, installation, and construction inherent to the Work for Type K copper tubing from corporation to curb stop, complete in place including: barrels, barricades and devices necessary for traffic control; preparation and protection; erosion control, site clearing, saw cutting, connection to corporation stop and curb stop; connection to existing service, excavation; stability of excavations; dewatering; backfill and fill; bedding and cover; crossing of underground utilities; support and backfill of existing utilities; compaction; grading; and maintenance; disposal of excess excavated materials; removal and disposal of pavements, site restoration and other incidental Work necessary to furnish and install Type K copper tubing to connect new main to existing service as specified, shown on the Drawings and required by field conditions.	

ITEM 9C: 1-inch Type K Copper Tubing (Curb Stop to Meter) ITEM 9D: 2-inch Type K Copper Tubing (Curb Stop to Meter)	
Measurement	As measured along the horizontal projection of the centerline of the tubing; measured from the face of curb stop to connection at meter.
Payment	Unit price per linear foot. Item to be installed only when directed by Owner.
Schedule of Payment	Monthly based on quantity installed, tested and accepted
Material, tools, equipment, services, installation, and construction inherent to the Work for Type K copper tubing from curb stop to meter, complete in place including: barricades, barrels and devices necessary for traffic control; preparation and protection; erosion control, site clearing, saw cutting, unions, couplings, removing and resetting water meters, pipe supports, connection to curb stop; connection to meter, excavation; crossing of underground utilities; support and backfill of existing utilities; pulling, moling or directional drilling; stability of excavations; dewatering; backfill and fill; bedding and compaction; foundation penetrations, watertight sealing of penetrations, repairs of penetrations to match existing conditions; grading; and maintenance; disposal of excess excavated materials; removal and disposal of pavements, site restoration and other incidental Work necessary to furnish and install Type K copper tubing from curb stop to meter when directed by Owner as specified and required by field conditions.	

ITEM 10A: 1-inch Corporation Stop **ITEM 10B: 2-inch Corporation Stop**	
Measurement	Number of units installed
Payment	Unit price each
Schedule of Payment	Monthly based on quantity installed, tested and accepted
Material, tools, equipment, services, installation, and construction inherent to the Work for corporation stops complete in place including: barricades, barrels and devices necessary for traffic control; preparation and protection; erosion control, site clearing, saw cutting excavation; stability of excavations; dewatering; saddles, tapping pipe; backfill and fill; bedding and cover; crossing of underground utilities; support and backfill of existing utilities; compaction; grading and maintenance; disposal of excess excavated materials; removal and disposal of pavements, site restoration and other incidental Work necessary to furnish and install corporation stops as specified, shown on the Drawings and required by field conditions.	

ITEM 10C: 1-inch Curb Stop, Curb Box and Cover **ITEM 10D: 2-inch Curb Stop, Curb Box and Cover**	
Measurement	Number of units installed
Payment	Unit price each
Schedule of Payment	Monthly based on quantity installed, tested and accepted
Material, tools, equipment, services, installation, and construction inherent to the Work for curb stops, curb boxes and covers complete in place including: barricades, barrels and devices necessary for traffic control; preparation and protection; erosion control, site clearing, saw cutting, couplings, unions; excavation; stability of excavations; dewatering; connection to existing water service; backfill and fill; bedding and cover; crossing of underground utilities; support and backfill of existing utilities; compaction; grading; and maintenance; setting curb box in vertical alignment, disposal of excess excavated materials; removal and disposal of pavements, site restoration and other incidental Work necessary to furnish and install curb stops, curb boxes and covers as specified, shown on the Drawings and required by field conditions.	

ITEM 11A: 4-inch Temporary Water Bypass Piping **ITEM 11B: 2-inch Temporary Water Bypass Piping**	
Measurement	As measured along the horizontal projection of the centerline of the pipe
Payment	Unit price per linear foot installed.
Schedule of Payment	Monthly based on progress; 50% upon accepted installation; 25% when placed in service; 25% upon removal and satisfactory restoration.
Material, tools, equipment, services, installation, construction and testing inherent to the Work for providing temporary water bypass system complete in place including: coordination, customer notification, barricades, barrels and devices necessary for traffic control; protection preparation, erosion control, site clearing, saw cutting, excavation; stability of excavations; dewatering; backfill and fill; bedding and compaction; grading; and maintenance; temporary water bypass pipe, valves and hydrants; temporary connections to existing water main or hydrants, ramping, temporary water service connections including wyes at hose bibbs, pavement restoration, site restoration, chlorination, dechlorination, and sampling in accordance with Specifications and AWWA C651, bills of lading and delivery of samples to certified laboratory, bacteria analysis by certified laboratory, delivering analysis results to Owner and Engineer, and other incidental Work to furnish, install, place in service and remove temporary bypass system and fire protection and domestic service during construction as specified, shown on the Drawings and required by field conditions.	

ITEM 11C: Tap Holes for Temporary Bypass System	
Measurement	Number of units installed
Payment	Unit price per each
Schedule of Payment	Monthly based on quantity installed, tested and accepted.
Material, tools, equipment, services, installation, construction and testing inherent to the Work for tap holes installed to feed temporary bypass system or service fire and domestic services or the distribution mains, complete in place including: barricades, barrels and devices necessary for traffic control; preparation and protection; erosion control, site clearing, saw cutting, capping existing water mains, couplings, bulkheads, plates, thrust restraint, joint restraints, excavation; stability of excavations; dewatering; connecting to existing water mains (as applicable); backfill and fill; bedding and cover; crossing of underground utilities; support and backfill of existing utilities; compaction; grading; and maintenance; disposal of excess excavated materials; removal and disposal of pavements, site restoration and other incidental Work necessary to furnish and install tap holes to provide fire protection and domestic service as specified, shown on the Drawings and required by field conditions.	

ITEM 12A: Unsuitable Materials Below Normal Grade **ITEM 12B: Unsuitable Materials Above Normal Grade**	
Measurement	As measure within pay limits shown on the Drawings
Payment	Unit price per cubic yard
Schedule of Payment	Monthly based on quantity removed and disposed of
Material, tools, equipment, services, installation, construction and testing inherent to the Work for excavation, disposal and replacement of materials unsuitable for pipe or structure subgrade or trench backfill complete in place including: barricades, barrels and devices necessary for traffic control; preparation and protection; erosion control, excavation; stability of excavations; dewatering; backfill and fill; excavating around existing underground utilities; support and backfill of existing utilities; compaction; grading; and maintenance; disposal of unsuitable materials; and other incidental Work specified, shown on the Drawings or required by field conditions.	

ITEM 13: Rock and Boulder Removal	
Measurement	In place prior to excavation within pay limits shown on the Drawings and as specified or measured after excavation for pre-blast areas.
Payment	Unit price per cubic yard
Schedule of Payment	Monthly based on quantity removed and disposed of
Material, tools, equipment, services, installation, construction and testing inherent to the Work for rock and boulder removal complete in place including: barricades, barrels and devices necessary for traffic control; preparation and protection; erosion control, excavation; stability of excavations; dewatering; pre- and post-blast surveys, blasting, insurance and permits, backfill and fill; compaction; grading; and maintenance; disposal of excess excavated materials; and other incidental Work and specified and required by field conditions.	

ITEM 14A: Furnish and Install Temporary Trench Pavement	
Measurement	In place within pay limits shown on Drawings
Payment	Unit price per ton
Schedule of Payment	Monthly based on quantity installed
Materials, tools, equipment, labor, and testing required to furnish and install temporary trench pavement complete in place, including preparation; traffic controls signs, barricades, barrels and devices; saw cutting; disposal of pavement; grading, emulsion; bituminous tack coat; adjusting of roadway castings; placement and compaction of binder course as specified on the Drawings in required lift depths; restoring pavement markings and all other incidentals necessary to furnish and install temporary trench pavement as specified and shown on the Drawings.	

ITEM 14B: Additional Hot Mix Asphalt	
Measurement	In place based on weight slips submitted
Payment	Unit price per ton
Schedule of Payment	Monthly based on quantity installed
Material, tools, equipment, services, installation, construction and testing inherent to the Work for additional hot mix asphalt for leveling, patching and adjustment of driveway aprons complete in place. Excludes Hot-mix asphalt used to level trench settlement.	

ITEM 15A: Remove and Dispose of Existing Hydrants	
Measurement	Number of units removed and disposed of
Payment	Unit price each
Schedule of Payment	Monthly based on quantity removed and disposed of
Material, tools, equipment, services, installation, construction and testing inherent to the Work for removal and disposal of existing hydrants, surface restoration and other incidental Work.	

ITEM 15B: Remove and Dispose of Existing Gate Boxes and Covers	
Measurement	Number of units removed and disposed of
Payment	Unit price each
Schedule of Payment	Monthly based on quantity removed and disposed of
Material, tools, equipment, services, installation, construction and testing inherent to the Work for removal and disposal of existing gate boxes and covers and other incidental Work.	

ITEM 15C: Remove and Dispose of Existing Curb Stops, Boxes and Covers	
Measurement	Number of units removed and disposed of
Payment	Unit price each
Schedule of Payment	Monthly based on quantity removed and disposed of
Material, tools, equipment, services, installation, construction and testing inherent to the Work for removal and disposal of existing curb stops, boxes and covers; surface restoration and other incidental Work.	

ITEMS 15D: Remove and Dispose of Existing Water Main	
Measurement	Number of units removed and disposed of
Payment	Unit price per linear foot of existing water main removed and disposed of
Schedule of Payment	Monthly based on quantity removed and disposed of
Material, tools, equipment, services, installation, construction and testing inherent to the Work for removal and disposal of existing water main and other incidental Work.	

ITEM 16: Calcium Chloride for Dust Control	
Measurement	In place to the dimensions shown on the Drawings and as required by Owner.
Payment	Unit price per pound
Schedule of Payment	Monthly based on quantity installed and approved
Material, tools, equipment, services, installation, and construction inherent to the Work for calcium chloride to provide dust control, including: preparation and protection; sweeping, spreading, maintenance, and other incidental Work.	

ITEM 17: Inlet Sediment Control Devices	
Measurement	Units installed, complete in place.
Payment	Unit price per each
Schedule of Payment	Monthly based on quantity installed and approved
Material, tools, equipment, services, installation, and construction inherent to the Work for inlet sediment control devices, including: preparation and protection; routine maintenance, removal of sediment, regular replacement, post construction cleaning of catch basin sumps and other incidental Work.	

ITEM 18: Straw Wattles for Erosion Control	
Measurement	In place, as measured by the Engineer or Owner along the horizontal projection of the centerline of straw wattles
Payment	Unit price per linear foot
Schedule of Payment	Monthly based on quantity installed and approved
Materials, tools, equipment, services, installation and construction inherent to the Work for furnishing, installing and removing erosion controls including: preparation and protection; staking; routine maintenance; legal disposal; loam; grading; hydroseed; site restoration and all other incidental Work necessary to furnish, install and remove erosion controls as specified, shown on the Drawings and required by field conditions and permit requirements.	

ITEM 19: Test Pits	
Measurement	In place, as measured by Owner or Engineer
Payment	Unit price per cubic yard
Schedule of Payment	Monthly based on quantity installed and approved
Material, tools, equipment, services, installation, and construction inherent to the Work for test pits to determine location, depth, diameter and material type of uncharted utilities, including: barricades, barrels and devices necessary for traffic control; preparation and protection; erosion control, site clearing, saw cutting, measuring pipe diameter, depth and location, excavation; stability of excavations; dewatering; backfill and fill; bedding and cover; compaction; grading; and maintenance; disposal of excess excavated materials; removal and disposal of pavements, restoring pavement to existing pavement depths, site restoration and other incidental Work necessary to test pit uncharted utilities at locations directed by Owner and as specified, shown on the Drawings and required by field conditions.	

ITEM 20: 3,000 psi Concrete for Thrust Restraint and Encasement	
Measurement	In place to the dimensions shown on the Drawings and as required by Owner.
Payment	Unit price per cubic yard
Schedule of Payment	Monthly based on quantity installed and approved
Material, tools, equipment, services, installation, construction and testing inherent to the Work for 3,000 psi concrete to encase pipe or provide thrust restraint, complete in place including: barricades, barrels and devices necessary for traffic control; preparation and protection; excavation; stability of excavations; dewatering; delivery, forms, placement, backfill and fill; compaction; grading; and maintenance; disposal of excess excavated materials; and other incidental Work necessary to furnish and install concrete as specified, shown on the Drawings and required by field conditions.	

ITEM 21: Owner's Contingency Allowance for Compaction Testing	
Measurement	Portion of Owner's contingency amount authorized per the Agreement
Payment	Percent of direct cost (no mark-up) not to exceed contingency amount in the Bid without prior written authorization of Owner.
Schedule of Payment	Monthly based on testing agency invoice submittal, as approved by Owner.
Direct cost (no mark-up will be allowed) to provide compaction testing performed by a qualified technician certified in "soils" by the New England Transportation Technician Certification Program (NETTCP) using the methods specified. Testing to be performed at depths and locations determined by the Owner. Excluded: Additional compaction tests and work performed to obtain desired compaction in trenches that failed initial compaction tests (performed at no additional cost to Owner).	

ITEM 22: Owner's Contingency Allowance for Contaminated Soil and Groundwater	
Measurement	Portion of Owner's contingency amount authorized per the Agreement
Payment	Percent of not to exceed contingency amount in the Bid without authorized by Change Order.
Schedule of Payment	Monthly based on progress and authorized by Change Order.
Material, tools, equipment, services, installation, construction and testing inherent to the Work for contaminated soil and groundwater, complete in place including: preparation and protection; excavation; stability of excavations; dewatering; stockpiling, maintenance, loading and transporting soils, treating and discharging groundwater, soil and groundwater characterization, laboratory analysis, backfill and fill; compaction; grading; and maintenance; disposal of excess excavated materials; saw cutting, pavement restoration, site restoration and other incidental Work.	

ITEM 23: Owner's Contingency for Materials Escalation Price Adjustment (Statutory)	
Measurement	Portion of Owner's contingency amount authorized per the Agreement
Payment	Percent of not to exceed contingency amount authorized by Change Order
Schedule of Payment	Monthly as authorized by Change Order
Material, tools, equipment, services, installation, construction and testing inherent to the Work for 3,000 psi concrete to encase pipe or provide thrust restraint, complete in place including: preparation and protection; excavation; stability of excavations; dewatering; delivery, forms, placement, backfill and fill; compaction; grading; and maintenance; disposal of excess excavated materials; and other incidental Work.	

ITEM 24: Asbestos Cement Water Main Removal	
Measurement	Number of units removed and disposed of
Payment	Unit price per linear foot of existing asbestos cement water main removed and disposed of
Schedule of Payment	Monthly based on quantity removed and disposed of
Material, tools, equipment, services, installation, construction and testing inherent to the Work for removal and disposal of existing asbestos cement water main and other incidental Work.	

PART 2 - PRODUCTS (not used)

PART 3 – EXECUTION (not used)

END OF SECTION

SECTION 01 43 05

QUALIFICATION REQUIREMENTS

PART 1 – GENERAL

1.01 SUMMARY

A. Meet or provide capability to meet the criteria specified below and in individual Specification sections in connection with various portions of the Work of the Contract Documents.

1.02 GENERAL REQUIREMENTS

A. Contractor shall have been regularly and actively engaged in similar Work as described in the Contract Documents, operating under the same business name and business organization structure, for the last 5 years on at least 5 projects.

B. Contractor shall have successfully completed at least 5 projects involving construction of similar facilities in the same state as the Project covered by the Contract Documents within the last 5 years. "Similar facilities" means similar in type, character, physical size, and complexity to that required by the Contract Documents.

C. Contractor shall have:

1. a full-time on-Site project manager in responsible charge of the Work with at least 10 years' experience as project manager on comparable projects.

D. Contractor only (**not including Subcontractors**) shall have successfully completed:

1. Five similar projects in the past 5 years that include the following.

    a. Replacement of water mains greater than 8-inches in diameter for distribution systems servicing a population greater than 9,000.

    b. Has been completed by the date of the Bid opening.

    c. Furnishing, installing and 24-hour maintenance of temporary water main systems with bypass piping 4-inches or greater in diameter and temporary service connections.

2. At least 5 projects that included pavement and street repair within public streets within the last 10 years.

1.03 SPECIAL REQUIREMENTS

A. Meet or provide capability to meet the following for Work identified.

1.04 STATUTORY

A. Any Work involving the removal, containment, or encapsulation of Asbestos or material containing Asbestos may only be performed by a licensed contractor in accordance with the provisions of MGL Chapter 149, Sections 6A-6E, applicable Laws and Regulations, and requirements as may be included in the Specifications and Drawings.

B. Sheet metal work must be performed by a contractor licensed in accordance with 271 CMR 1.00, et seq. governing licensing, permitting, and sheet metal work in Massachusetts.

END OF SECTION

SECTION 01 50 00

TEMPORARY FACILITIES AND CONTROLS

PART 1 – GENERAL

1.01 SUMMARY

A. This Section specifies temporary facilities and controls for execution of the Work put into place for use only during the period of construction, that will be removed when no longer required for construction operations. This Section applies to all Specifications and Drawings and provisions of this Section may be supplemented in other sections of Division 01.

B. Certain provisions required by Laws and Regulations may be referenced. Contractor is responsible to determine and obtain applicable Laws and Regulations and to review and interpret the full text of such Laws and Regulations.

C. Section Includes

1.02 TEMPORARY CONSTRUCTION FACILITIES
Barriers
Protection of Work
Security
Safety Facilities
Access Roads
Parking
Field Offices
Staging Area
Project Identification
Progress Cleaning and Waste Removal

1.03 TEMPORARY UTILITIES

1.04 TEMPORARY CONTROLS
Pest Control
Dust Control
Water Control and Dewatering
Erosion and Sediment Control
Noise Control
Pollution Control
Traffic Regulation

1.05 REMOVAL OF TEMPORARY UTILITIES, FACILITIES, AND CONTROLS

1.02 TEMPORARY CONSTRUCTION FACILITIES

A. Barriers

1. Comply with the requirements of Paragraph 6.11. of the Standard General Conditions and Supplementary Conditions, if any.

2. Furnish barriers to prevent unauthorized entry to and clear delineation of construction areas, to allow for Owner's use of Site, and to protect existing facilities and adjacent properties from damage from construction operations as recommended by OSHA and as otherwise required for the protection of life and property during construction.

3. Construct barricades and protective facilities in accordance with local and state regulations. Furnish and install signs, lights, reflectors, and such protection facilities as may be required.

4. Furnish barricades required by governing authorities for public rights of way.

5. Provide protection for plant life designated to remain. Replace damaged plant life.

6. Protect non owned vehicular traffic, stored materials, Site and structures from damage.

7. If required, furnish commercial grade, minimum 8 foot high chain link fence around construction Site. Equip with vehicular gates with locks.

B. Protection of Work

1. Protect Work during working and non-working hours.

2. Provide special protection where specified in Specifications or Drawings and in accordance with manufacturer recommendations.

3. Furnish temporary and removable protection for installed equipment and material. Control activity in immediate Work area to minimize damage.

4. Protect exterior areas of Work from damage. Prohibit traffic from landscaped areas.

5. Buildings and Enclosures

    a. Furnish protective coverings at walls, projections, jambs, sills, and soffits of openings and protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects, by protecting with durable sheet materials.

    b. Prohibit traffic or storage upon waterproofed or roofed surfaces. If traffic or activity is necessary, obtain recommendations for protection from waterproofing or roofing material manufacturer.

6. Whenever gale or high winds are forecast, take measures to secure loose material, equipment or other items that could be blown and be damaged or cause damage. Do not leave such loose items unsecured at end of a working day. Particular attention shall be taken with scaffolding and items placed or stored on roofs or within a structure prior to being enclosed.

7. Provide for removal of snow and ice which may impede Work, damage the finishes or materials, be detrimental to workers, or impede trucking, delivery, or moving of materials at the Site, or prevent adequate drainage of the Site or adjoining areas.

C. Security

1. Provide protection to stored items, the Work and Owner's operations from unauthorized entry, vandalism, or theft, and against fire, storms and other losses during working and non-working hours.

2. Coordinate with Owner's security program.

D. Safety Facilities

1. Provide first aid and other safety facilities required by Laws and Regulations during working and non-working hours.

E. Access Roads

1. Construct and maintain temporary roads accessing public thoroughfares to serve construction area. Control dust and water.

2. Extend and relocate as Work progress requires. Provide detours necessary for unimpeded traffic flow.

3. Provide for emergency access and maintain throughout the Work Site.

F. Parking: off-Site at a location determined by Contractor.

1. Do not allow construction vehicle parking on existing pavement or sidewalks.

G. Field Offices: Not required for the Project.

H. Staging Area: Owner is not providing a location for staging area. Determine and secure a location for staging area.

I. Project Identification: not required for the Project.

J. Progress Cleaning and Waste Removal

1. Comply with the requirements of Paragraph 6.11. B and C of the Standard General Conditions and Supplementary Conditions, if any.

2. Maintain areas free of waste materials, debris, and rubbish and maintain the Site in a clean and orderly condition.

3. Remove debris and rubbish from spaces and other closed or remote spaces before enclosing the space.

4. Collect and remove waste materials, debris, and rubbish from Site at least weekly and legally dispose off-Site.

1.03 TEMPORARY UTILITIES

A. Power service: Not required for the Project.

B. Telephone service and internet access to field offices: Not required for the Project.

C. Water service: as specified below.

1. Arrange for, pay for and maintain suitable quality water service as required for duration of Project.

D. Furnish and maintain required sanitary facilities and enclosures. Do not use existing facilities.

E. Furnish lighting for construction operations. Furnish lighting for exterior staging and storage areas and for security purposes. Maintain lighting and provide routine repairs.

F. Furnish heat devices and heat and cooling devices as required to maintain specified conditions for construction operations.

G. Ventilate enclosed areas to assist cure of materials, to dissipate humidity, and to prevent accumulation of dust, fumes, vapors, or gases.

H. Fire Protection

1. Provide temporary fire protection equipment and services during construction per NFPA and local fire code and regulations, and fire marshal's requirements.

2. Use Work procedures that minimize fire hazards to the extent practicable and materials that are fire resistant where possible. Collect and remove combustible debris and waste materials from the Site each day. Store fuels, solvents, and other volatile or flammable materials away from the construction and storage areas in well-marked, safe containers in accordance with Laws and Regulations.

1.04 TEMPORARY CONTROLS

A. Pest Control: Provide methods, means, and facilities to control and prevent spread of pests during construction operations. If required, provide for extermination of pests in accordance with Laws and Regulations. For extensive infestations, obtain the services of a licensed exterminator and coordinate plan with Owner and Engineer.

B. Dust Control: Execute Work by methods to minimize raising dust from construction operations. Provide positive means to prevent air-borne dust from dispersing into atmosphere. Utilize the application of sprinkled water to reduce the emission of air-borne soil particulates from the Project Site.

C. Water Control and Dewatering: as specified below.

1. Grade Site to drain away from excavations to approved drainage collection facilities. Ensure collected surface drainage water meets permitted criteria for sediment content prior to discharge.

2. Maintain excavations free of water. Furnish, operate and maintain pumping equipment.

3. Dewater excavations and legally dispose of water in a manner that will not cause injury to public and private property.

4. Protect Site from puddling, ponding or running water.

5. Obtain necessary regulatory approvals for the disposal of dewatering flows, including, among others, approval by the Environmental Protection Agency under the National Pollutant Discharge Elimination System (NPDES) program for construction dewatering activities. Submit the completed and approved construction dewatering permit to the Engineer immediately upon receipt.

6. Design, furnish, install, maintain, operate and remove temporary dewatering systems as required to lower and control water levels and hydrostatic pressures in excavations during construction; legally dispose of pumped water; construct, maintain, observe and, except where indicated or required to remain in place, remove dewatering equipment and system at the completion of construction.

    a. Dewatering may include: lowering the water table, intercepting and collecting seepage which may penetrate the support of excavation, slopes or bottom of the excavation; increasing the stability of excavated slopes; preventing loss of material from beneath the slopes or bottom of the excavation; reducing lateral loads on sheeting and bracing; limiting horizontal displacements and stresses in support of excavation to tolerable and allowable levels; preventing displacements of existing structures, utilities, pavements, and sidewalks; improving the excavation and hauling characteristics of sandy soil; preventing rupture or heaving of the bottom of any excavation; and disposing of pumped water.

D. Erosion and Sediment Control: as specified below.

1. Comply with:

    a. MassDEP requirements

    b. MassDOT requirements within State rights of way

    c. Massachusetts Erosion and Sediment Control Guidelines for Urban and Suburban Areas, prepared by the MassDEP

2. Plan and execute construction using methods to control surface drainage from cuts and fills, from borrow and waste disposal areas and prevent erosion and sedimentation.

3. Submit erosion and sediment control plan to Engineer prior to the start of construction.

4. Install erosion and sediment controls as shown on the Drawings and as required by Laws and Regulations. Install additional erosion and sedimentation control measures as necessary to stabilize the Site. Coordinate temporary erosion controls with permanent erosion controls to the extent practical. Provide and maintain devices to control erosion, siltation, and sedimentation that occur during construction operations. Undertake reasonable precautions and measures to avoid erosion of soil and to prevent silting of drainage ditches, storm sewers, rivers, streams, and lakes.

5. Employ pollution prevention measures, erosion and sedimentation control before, during, and after soils are exposed. Implement measures prior to soil disturbance or soil storage to the extent possible to ensure that such measures are in place before activity occurs and employ additional measures as the Work progresses. Implement and maintain as necessary until the Site is permanently stabilized.

6. Perform inspections of disturbed soil areas, material storage areas exposed to precipitation, and erosion control measures with Engineer a minimum of once every 14 days and also within 24 hours after any storm event greater than 0.5 inches of rainfall. Immediately correct deficiencies in the erosion control measures identified or indicated by failures or erosion by implementing additional measures or different techniques to correct and prevent subsequent erosion at no additional cost to Owner.

7. In the event that silt or debris breaches erosion control, immediately remove and clean silt or debris from drainage ditches and storm sewers and revise erosion control measures as required by the Conservation Commission or the Engineer. Should silt or debris breach erosion controls and reach rivers, streams or lakes, immediately notify local, state or Federal representatives as required and implement required remediation methods at no additional cost to Owner.

8. Limit duration of the exposure of soils on embankments, excavations, and graded areas to a minimum.

9. Provide temporary measures such as berms, dikes and drains to prevent water flow. Install erosion control measures in any ditch, swale or channel before water is allowed to flow in the waterway. Handle water pumped from trenches to minimize discharge of silty water to the maximum extent practicable.

10. Stabilize storm drain outfalls before the discharge points become operational. Install inlet protection immediately upon construction of culverts.

11. Stabilize disturbed areas with temporary and permanent erosion control practices as soon as practicable, but no more than 14 days after construction activity on a particular portion of the Site has temporarily or permanently ceased. Exceptions to this time requirement include: a) where construction activities will resume on the particular portion of the Site within 21 days; and b) where snow cover delays initiation of stabilization measures.

12. Place stockpiled topsoil on the Site away from natural drainages, in piles with side slopes of 50 percent to 70 percent. Install siltation fence around the base of the pile to prevent eroding soil from washing into drainages. Cover topsoil piles which are to remain for a period of 21 days or more with temporary seed and mulch immediately following stockpiling.

13. Conduct pavement sweeping to remove sediment and soil debris accumulation on pavement resulting from construction activity.

E. Noise Control

1. Provide methods, means, and facilities to minimize noise from construction operations.

2. Provide noise attenuation systems capable of meeting the federal and state Department of Environmental Protection Air Quality Control Regulations.

3. Construct sound enclosures or utilize other noise reduction techniques if the equipment does not meet the noise level requirements.

F. Pollution Control: as specified below.

1. Provide methods, means, and facilities to prevent contamination of soil, water, and atmosphere from discharge of noxious, toxic substances, and pollutants produced by construction operations.

a. Water Pollution Control

1) Ensure that sediment, debris, petroleums, chemicals, or other contaminants will not enter existing drainage facilities and channels. Use construction methods that will prevent entrance of pollutants and wastes into existing streams, rivers, lakes, and flowing and dry watercourses.

2) Obtain legal disposal sites and dispose of pollutants and wastes in a legal manner.

3) Respond immediately to emergencies as directed when water quality of existing streams, rivers, lakes and flowing and dry watercourses is threatened. Take corrective action to remove or contain pollutants until a permanent solution is determined.

4) Submit a plan and employ additional protective measures to prevent harm to wetland resource areas as shown on the Drawings.

b. Air Pollution Control

1) Equipment and vehicles that exhibit excessive exhausts emissions due to poor engine adjustments or inefficient operation will not be permitted to operate until corrective repairs or adjustments are made.

2) Burning of materials from clearing or grubbing operations, combustible construction materials, and rubbish will not be allowed.

G. Traffic Regulation: as specified below.

1. Submit traffic control plans and coordinate with Owner and local agencies. Submit plan for traffic control to Owner for review 14 days in advance of any Work within public right-of-way, street closure or detour.

2. Provide and maintain traffic control and maintenance devices in accordance with Part 6, Temporary Traffic Control, of the "Manual on Uniform Traffic Control Devices for Streets and Highways", published by the U.S. Department of Transportation, Federal Highway Administration and other applicable codes and standards as specified. Operate devices 24 hours per day as required.

a. Comply with applicable portions of the “Massachusetts Amendments to the 2009 Manual on Uniform Traffic Control Devices and the Standard Municipal Traffic Code” published by the Massachusetts Department of Transportation Highway Division.

b. Comply with relevant provisions of Section 7.00 of the MassDOT Standard Specifications and Supplements, and the following.

1) The intent of posting police details is to ensure public safety and protection of property through appropriate traffic control. Police personnel are not to be employed as watchmen to protect the Contractor's equipment and materials.

2) All uniformed traffic police personnel required for traffic control for construction shall be authorized by Owner’s Safety Officer and/or the Engineer.

3) Payment will be made by Owner for uniformed traffic police only.

4) Submit a forecast weekly traffic police detail schedule, at least 72 hours prior to the start of the Work describing: the nature and location of the Work, the number of police personnel, the estimated number of police hours required for each location, and justification for each uniformed officer being requested. Payment to the police for work under this Contract shall be in accordance with the Massachusetts General Laws, Chapter 149, Section 34B.

5) If uniformed police have been arranged to work, and weather or some other situation prohibits the Work, notify the Police Department Detail before 5:30 a.m. on the day of intended Work to cancel the work order. Unless the work order is canceled in time, the Contractor shall be charged at the rate of minimum four hours for each officer included in the detail and shall be fully responsible for payment of all charges thus incurred.

3. Provide for access by emergency vehicles, such as police, fire, and disaster units at all times. Contractor shall be liable for damages resulting from failure to provide such access.

4. During construction hours, traffic flow must be controlled by uniformed traffic police officers or other traffic controllers allowed by Laws and Regulations. The services of traffic controllers shall in no way relieve the Contractor of its responsibilities under the Contract.

   a. Coordinate schedule of police details with Owner.

   b. Police details will be direct billed to the Owner per Section 01 20 25.

5. Maintain minimum of one moving lane on roadways at all times.

   a. Where detours are permitted, provide necessary barricades, flashers, flashing arrows and signs in accordance with referenced Manuals and Laws and Regulations.

   b. Provide gravel borrow and bituminous concrete to maintain temporary passable travel lane ramps, temporary bridging, steel plates, temporary pavement, wood-framed walkways, caution, safety and other necessary signs directing the pedestrian and vehicular traffic towards unblocked and safe areas.

   c. Except when road closure and road blockage permits are obtained, maintain two lanes of traffic (one in each direction) on _____Street throughout construction and during non-working hours to the maximum extent possible.

   d. Lane closures will not be permitted from #:00 am to #:00 am and #:00 pm to #:00 pm except when road closure and road blockage permits are obtained.

6. Provide safe access/egress to businesses and abutting property owners within the Project area. In areas where the construction activity is in progress, provide directional signs in front of businesses indicating "OPEN FOR BUSINESS" or similar for guidance of customers.

    a. Certain construction operations such as utility work and roadway/sidewalk reconstruction may restrict access/egress on some roads and to businesses and abutting property owners. Under these circumstances, schedule operations during off-peak hours or late evenings with Owner approval so that a particular work activity can be completed in the shortest possible time.

    b. Provide 48 hours notice to businesses and abutting property owners when access/egress will not be available or restrictions will exist.

7. Exercise particular care to establish and maintain such methods and procedures that will not create hazards.

    a. Remove or properly cover traffic control, safety devices and/or signs having messages that are irrelevant to normal traffic conditions at the end of each Work period. Keep signs clean at all times and provide that legends are distinctive and unmarred.

    b. Place excavated material and construction equipment so that vehicular and pedestrian traffic is maintained at all times unless road closure permit is obtained. If the Contractor's operations cause traffic hazards, implement appropriate safety measures immediately.

    c. In areas of high pedestrian and vehicular traffic volume, the remove waste materials and construction equipment from the Work Site on a daily basis. Do not park construction equipment overnight on the Site or the adjacent roads unless permitted by Owner.

    d. Provide night watchmen where special hazards exist.

8. Post signage clearly stating that any vehicle impeding the progress of construction will be towed at the vehicle owner’s expense. Towing charges incurred by Owner for Contractor’s failure to post such signs will be borne by the Contractor.

1.05 REMOVAL OF TEMPORARY UTILITIES, FACILITIES, AND CONTROLS

A. Remove temporary utilities, equipment, and facilities before Final Application for Payment inspection.

B. Remove temporary underground installations and grade Site as indicated. Clean and repair damage caused by installation or use of temporary utilities, facilities, and controls.

C. Restore existing facilities and areas used during construction to original condition. Restore permanent facilities used during construction to specified condition.

END OF SECTION

SECTION 01 51 38

TEMPORARY WATER BYPASS

PART 1 – GENERAL

1.01 SUMMARY

A. Section Includes

1. Provide, test, operate and maintain temporary water bypass system in accordance with the Drawings unless modified by Contractor and approved by Owner and Engineer. Temporary water bypass system is intended to maintain fire protection and water service impacted by the Project until permanent water service and fire protection is restored.
2. Disinfect and test temporary bypass system in accordance with requirements of AWWA C651 prior to placing into service and after repairs. Operate and maintain system until permanent water service and fire protection is restored.
3. Provide public notification as specified in Section 01 11 00.
4. Provide temporary valves, temporary hydrants, and temporary subsurface connections, in accordance with the Drawings unless modified by the Contractor and approved by the Owner and Engineer.
5. Provide temporary fire and domestic service connections, including subsurface connections, and service hoses, including wye connections at hose bibbs, for each property requiring a temporary domestic or fire service. Close valve at meter prior to activating temporary domestic service connection.
6. Provide temporary hydrant for each fire department connection (FDC).
7. Bury temporary bypass water system at roadway crossings, pedestrian ramps, driveway crossings as specified, and areas required by Owner or Engineer to protect the temporary bypass system from damage and maintain public safety.
8. Provide temporary and permanent hot-mix asphalt in accordance with Section 32 12 16 for all temporary bypass water main system trenches.

B. Related Requirements

1. Section 32 12 16 – Asphalt Paving
2. Section 32 90 00 – Planting
3. Section 33 01 10.58 – Disinfection of Water Utility Piping Systems
4. Section 33 14 11.01 – Water Utility Piping – Ductile Iron
5. Section 33 14 19 – Valves and Hydrants for Water Utility Service

6. Section 33 14 21 – Water Service Connections – Copper

1.02 PRICE AND PAYMENT PROCEDURES

A. Measurement and payment requirements: per Division 01 General Requirements.

1.03 REFERENCES

A. Reference Standards

1. American National Standards Institute (ANSI)
   a. ANSI/NSF 61 - Drinking Water System Components – Health Effects
   b. ANSI/NSF 372 – Drinking Water Components – Lead Content
2. American Water Works Association (AWWA)
   a. AWWA C504 – Rubber-Seated Butterfly Valves
   b. AWWA C651 – Disinfecting Water Mains
   c. AWWA C800 – Underground Service Line Valves and Fittings
   d. AWWA C901 - Polyethylene (PE) Pressure Pipe and Tubing, ¾ In. (19 mm) Through 3 In. (76 mm), for Water Service
   e. AWWA C906 – Polyethylene (PE) Pressure Pipe and Fittings, 4 In. Through 65 In. (100 mm Through 1,650 mm) for Waterworks
3. ASTM International (ASTM)
   a. ASTM A53 – Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless
   b. ASTM A183 – Standard Specification for Carbon Steel Track Bolts and Nuts
   c. ASTM A449 – Standard Specification for Hex Cap Screws, Bolts and Studs, Steel, Heat Treated, 120/105/90 ksi Minimum Tensile Strength, General Use
   d. ASTM A536 – Standard Specification for Ductile Iron Castings
   e. ASTM B62 – Standard Specification for Composition Bronze or Ounce Metal Castings
   f. ASTM B584 – Standard Specification for Copper Alloy Sand Castings for General Applications
   g. ASTM D2737 – Standard Specification for Polyethylene (PE) Plastic Tubing
   h. ASTM D3350 – Standard Specification for Polyethylene Plastics Pipe and Fittings Materials

i. ASTM F714 – Standard Specification for Polyethylene (PE) Plastic Pipe (DR-PR) Based on Outside Diameter

j. ASTM F1055 – Standard Specification for Electrofusion Type Polyethylene Fittings for Outside Diameter Controlled Polyethylene and Crosslinked Polyethylene (PEX) Pipe and Tubing

4. Factory Mutual (FM)

5. Underwriters Laboratories Inc. (UL)

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordination, Sequencing, and Scheduling: in accordance with Division 01 General Requirements.

1.05 SUBMITTALS

A. Submit in accordance with Division 01 General Requirements.

1. Submit a plan and schedule for installation of temporary water bypass system. Submit any modifications to bypass system shown on Drawings at least 14 days prior to beginning Work for review and approval by Owner and Engineer.

2. Minimum requirements for bypass plan and schedule:

a. Revisions to the temporary water bypass system shown on the Drawings including connections to existing hydrants, temporary subsurface connections to existing water mains and domestic and fire services, street crossings, existing valves to be operated, and location of temporary hydrants, temporary valves, and temporary water bypass sampling locations.

b. Description of connection procedures for domestic services, details and a description of installation procedures for subsurface connections to existing mains and fire services, including thrust restraint, and disinfection procedures

c. Daily schedule outlining the locations where temporary water mains will be installed and notification procedures for business owners and residents

3. Emergency Contact List: include name, address, home and mobile telephone numbers of at least 3 Contractor employed personnel, qualified to work on municipal water distribution systems and skilled in the operation, maintenance and repair of the temporary water bypass system in use.

a. Each contact must be familiar with the temporary water bypass system in use, with specific knowledge of its operation and maintenance requirements and valve locations

b. Each contact must be available 24 hours per day, 7 days per week, and able to respond to emergency repair calls within a maximum of 2 hours.

4. Written notice informing water customers of temporary bypass system installation and connection and disconnection process, including emergency contact information.

1.06 QUALITY ASSURANCE

A. Provide in accordance with Division 01 General Requirements.

1.07 SITE CONDITIONS

A. Existing Conditions: per Division 01 General Requirements.

PART 2 – PRODUCTS

2.01 TEMPORARY BYPASS WATER MAIN

A. Provide high density polyethylene (HDPE) or galvanized steel pipe with watertight joints capable of withstanding whatever forces, including traffic loads, they will encounter.

1. Pipe:

a. High density polyethylene (HDPE) pipe: good condition; manufactured from high density, extra high molecular weight compound equaling a PE 3408 or PE 4710 designation and conforming to ASTM D1248 and ASTM D3350, with a cell classification of 345434C; comply with ANSI/NSF 61 and ANSI/NSF 372.

b. Hot dipped galvanized steel pipe: schedule 10 or greater, in good condition; manufactured to meet the requirements of ASTM A53, UL listed, FM approved; comply with ANSI/NSF 61 and ANSI/NSF 372.

c. Other pipe materials: not permitted for the temporary bypass water system.

2. Working pressure: minimum 200 psi.

3. Minimum wall thickness:

Diameter	HDPE (in.)	Galvanized Steel (in.)
6-inch	0.736	0.134
4-inch	0.500	0.120
2-inch	0.264	0.109

4. Fittings and Couplings: restrained grooved joint design or approved equal; ductile iron conforming to ASTM A536; comply with ANSI/NSF 61 and ANSI/NSF 372; designed to resist flexure and torsion loads; UL listed, FM approved; minimum 300 psi working pressure; EPDM gaskets; heat-treated, plated carbon steel, trackhead bolts and nuts complying with ASTM A449 and ASTM A183.

2.02 TEMPORARY WATER SERVICE CONNECTIONS

A. Temporary water service connections: minimum 3/4-inch polyethylene or rubber hose tubing complying with ANSI/NSF 61 and ANSI/NSF 372 and bearing the imprint of the National Sanitary Foundation approval for potable water (NSF-PW).

2.03 TEMPORARY HYDRANTS AND VALVES

A. Temporary hydrants: ductile iron conforming to ASTM A536; comply with ANSI/NSF 61 and ANSI/NSF 372; 4-1/2-inch pumper nozzle; acceptable to and supported by means approved by the local Fire Department to prevent deflection of the hydrant or bypass piping system when the hydrant is in operation.

B. Temporary valves: watertight, butterfly, rubber seat type; operating nut controlled by standard wrench; arrow indicating open direction; comply with ANSI/NSF 61 and ANSI/NSF 372. Temporary valve shall be same diameter as bypass pipe it is connected to.

PART 3 – EXECUTION

3.01 GENERAL

A. Provide temporary water bypass system as shown on the Drawings and as specified. Submit modifications to the temporary water bypass system in accordance with Article 1.05 prior to beginning any Work on the Project.

B. Install, test and put temporary water main bypass system, including temporary hydrants, temporary valves, domestic and fire service connections, subsurface connections, service blow backs and permanent gate valves shown on the Drawings and required to isolate existing distribution system in service prior to beginning water main construction.

C. Coordinate and schedule installation, testing and removal of temporary bypass water main system to prevent interruption of water service or fire protection. Interruption of water service or fire protection shall be permitted when connecting and disconnecting services to temporary bypass system, unless otherwise noted on the Drawings. No other interruptions of water service or fire protection shall be permitted.

1. As a minimum, connect temporary bypass water mains to the existing distribution system at both ends to maintain continuity in the distribution system. "Dead-ending" of the temporary water bypass system is not permitted except as shown on Drawings.

2. Take necessary measures, including tapping existing water mains and installing gate valves when existing hydrants and existing gate valves are unavailable for use, to assure continuous water service and fire protection.

3. Test and place temporary bypass system in service prior to terminating service to existing water mains.

D. Provide, maintain, and remove service hoses of approved size, to service all customers from valve connections on the bypass pipe.

E. Provide separate temporary service connections for each domestic and fire service. Directly connecting one building to another is prohibited.

F. Meet the following minimum requirements when temporary bypass system is not shown on Drawings or Contractor proposes modifications to bypass system shown.

1. Temporary bypass for fire service: 6-inch diameter unless otherwise approved in writing

2. Temporary bypass for domestic service: minimum 2 inches in diameter.

3. Temporary hydrants: Provide for each existing and proposed hydrant and at buildings with FDC. Provide additional temporary hydrants when required by the local Fire Department at no additional cost to the Owner.

4. Temporary valves: Provide watertight temporary butterfly valves at hydrant connections, subsurface connections, branch lines to provide 3-way control, and at 800 linear foot increments along main. Provide additional temporary valves when directed at no additional cost to the Owner.

5. Temporary bypass system feeds: At a minimum, connect fire protection main at each end of bypass system to existing mains that will remain in service. Provide additional fire protection main connections, when directed, at no additional cost to Owner. Provide temporary hydrant and valve at hydrant connection feeding temporary fire main. Locate temporary valve after temporary hydrant to ensure temporary hydrant remains live when temporary valve is closed.

6. Temporary service connections

   a. Fire service: off fire protection main. Provide fire service connection of same diameter as existing service but in no case less than 4-inch connection.

   b. Domestic service: minimum 3/4-inch diameter as specified in Article 2.02.

G. Contact local Fire District Chief and Fire Alarm in writing prior to installation of temporary water bypass system. Schedule site visit with District Chief to review system. Review District Chief comments with Engineer and make modifications required. Provide copy of notice to Fire District Chief and Fire Alarm to Owner and Engineer.

H. Minimize inconvenience to businesses, property owners and water customers during connection and disconnection. Provide public notification as specified in Section 01 11 00 and this section.

3.02 PIPING

A. Provide water tight temporary bypass system. Exercise care throughout the installation of the temporary mains and service connections to avoid possible contamination of water mains or house services or contamination of the temporary bypass pipe itself. Flush, disinfect and test all temporary mains and services to prevent contamination in accordance with Section 33 01 10.58 and AWWA C651.

B. Lay temporary piping along curb or at back of sidewalks in a manner that protects public health and safety, minimizes disruption to vehicular and pedestrian traffic, and avoids damage to temporary bypass system. Bury all bypass piping at road crossings and accessible ramps. Unless otherwise required by Owner, ramp 4-inch or smaller bypass piping with gravel, cold patch, or other approved material at driveways and sidewalks in a manner that will protect pipe, prevent erosion or migration of ramping material, maintain public health and safety, and avoid damage to vehicles, disruption of traffic, or trip hazards to pedestrians. Bury bypass piping greater than 4 inches in diameter at driveway and sidewalk crossings. Pave bypass trench with hot-mix asphalt. Ensure bypass trench pavement is flush with existing pavements.

1. Take additional precautions to minimize public inconvenience in areas where bypass pipe or service hoses may be considered an obstruction to safe passage. Additional precautions may include, but are not limited to, providing additional ramping, cold patch, or burying bypass pipe and service hoses as directed by Owner or Engineer.

2. Cut narrow trench to bury bypass at roadway crossings, accessible ramps, driveways, sidewalk crossings and other areas deemed necessary by Owner or Engineer. Trench shall be cut with enough width and depth to allow placement of the bypass pipe and 2-inches of hot-mix asphalt pavement patch. Place temporary hot-mix asphalt pavement patch and compact in accordance with Section 32 12 16. Compaction of hot-mix asphalt pavement patch or cold patch used in ramping by vehicular traffic is prohibited.

3.03 OPERATION AND MAINTENANCE

A. Maintain temporary bypass system 24 hours per day, 7 days per week until the Work has been completed and the bypass system has been removed.

B. Complete sections of the Project in progress before the daily low temperature falls below 40 degrees Fahrenheit. Maintain all components of the bypass system impacted by freezing conditions, including service connections and take reasonable measures when scheduling Work as cold weather season approaches. Should it become necessary to stop Work and remove the bypass system due to freezing conditions, re-install, disinfect, test, and return the temporary bypass system to service at no additional cost to the Owner.

3.04 REMOVAL

A. Remove temporary bypass system after placing new water main, hydrants and services in service. Remove all bypass pipe and hoses, saw cut neat, straight edges for bypass trenches, backfill bypass trenches with gravel and compact in accordance with Section 31 00 00. Provide permanent hot-mix asphalt pavement patch in accordance with Drawings.

END OF SECTION

SECTION 01 60 00

PRODUCT REQUIREMENTS

PART 1 – GENERAL

1.01 SUMMARY

A. This Section specifies general requirements for products, materials and equipment. This Section applies to all Specifications and Drawings and provisions of this Section may be supplemented in other sections of Division 01.

B. Certain provisions required by Laws and Regulations may be referenced. Contractor is responsible to determine and obtain applicable Laws and Regulations and to review and interpret the full text of such Laws and Regulations.

C. Section Includes

1.02 SOURCE QUALITY CONTROL
General
Independent Testing Agency Certification
Factory Testing

1.03 PRODUCT REQUIREMENTS
General
Transportation and Handling
Storage and Protection

1.04 WARRANTIES

1.02 SOURCE QUALITY CONTROL

A. General

1. Subject material and equipment furnished under the Contract Documents to a complete factory testing program as specified.

2. Shop Drawings and submittals: reviewed by Engineer before initiating testing program.

3. Perform checks and tests in accordance with manufacturer's recommendations and referenced standards.

4. Evaluate test results and advise Owner immediately of any discrepancy between test results and test limits or the failure of any device or system under test. Include test limits for acceptability applicable to each test on the certified test records.

5. Record test information, including the evaluation of testing results, on forms approved by Owner and Engineer.

B. Independent Testing Agency Certification

1. If specified, furnish certificates from an independent testing agency.

2. Independent testing agency to certify that material and equipment components have been examined and tested and are in conformance with the requirements specified in the Contract Documents.

3. Take Samples in accordance with the requirements specified in the Contract Documents, as selected by Owner or independent testing agency. Furnish and ship at no additional cost to Owner.

C. Factory Testing

1. Provide 14 days prior written notice of factory inspections and tests to Owner and Engineer.

2. If failure to give proper written notice results in material and equipment being assembled or covered before a factory inspection or test, make material and equipment ready for inspection or test and reassemble or recover at no additional cost to Owner.

3. Owner may inspect any portion of material and equipment furnished at any reasonable time during manufacture and may witness testing of any portion of material and equipment wherever located. Owner and Engineer to witness tests only.

4. Furnish, set up and operate test equipment and facilities.

5. If facilities for conducting required tests are unavailable to the manufacturer, conduct tests elsewhere or have them performed by an independent agency approved by Owner.

6. Protect material and equipment after testing and checking to provide that subsequent testing of other equipment or systems does not disturb, damage or otherwise interfere with functional capability of material and equipment.

7. Assume responsibility for protection of material and equipment and safety of all personnel during factory testing program.

8. Grounds for rejection: failure to withstand tests; failure to meet ratings; failure to meet applicable standards.

9. In the event of failure

    a. Submit revisions of documents requiring approval for changes required for rectification.

    b. Obtain Owner's and Engineer's approval before making such changes.

    c. Provide written details of any changes to be made not requiring approval.

    d. Notify Owner and Engineer in writing before retesting.

    e. Furnish new material and equipment which meets requirements of the Specifications if rejected material and equipment cannot be rectified to satisfaction of Owner and Engineer.

    f. Retest after rectification in presence of Owner or Engineer.

10. Assume responsibility for all costs, including, but not limited to: loss or damage to materials and equipment resulting from testing; retesting; rectification; new material and equipment to replace damaged or non-rectifiable material and equipment; removal, furnishing, transportation, unloading, and installation of replacement material and equipment; and witness of testing by Owner and Engineer including travel, lodging, meals, and payroll.

11. Submit certified test reports which define tests, list results, and are signed by Contractor's representative, and copies of raw data collected during tests. Submission of certified test reports does not relieve Contractor of responsibility for material and equipment meeting requirements of the Contract Documents after installation.

1.03 PRODUCT REQUIREMENTS

A. General

1. Products include new material and equipment incorporated into the Work and may also include existing material and equipment required for reuse. This does not include machinery and equipment used for preparation, fabrication, conveying, installation and erection of the Work.

2. Do not use materials and equipment removed from existing Work Site, except as specifically permitted.

3. Provide complete with accessories, trim, finished, safety guards, and other devices and details need for a complete installation and for the intended use or effect.

4. Provide standard products which have been produced and used successfully on other similar projects for similar applications. Provide products which are likely to be available to Owner in the future for items required for maintenance and repair or replacement Work.

5. Furnish interchangeable components of the same manufacturer, for similar components.

B. Transportation and Handling

1. Transport and handle material and equipment in accordance with manufacturer's instructions.

2. Notify Engineer and Owner in writing upon acceptance of a shipment.

3. Promptly inspect shipments to assure that material and equipment comply with requirements, quantities are correct, and material and equipment are undamaged.

4. Furnish equipment and personnel to handle material and equipment by methods to prevent soiling, disfigurement, or damage.

5. Uncrate equipment and dispose of packing material properly.

C. Storage and Protection

1. Store and protect material and equipment in accordance with manufacturer's instructions, with seals and labels intact and legible. Store sensitive material and equipment in weather tight, climate controlled enclosures.

2. For exterior storage of fabricated material and equipment, place on sloped supports, above ground.

3. Provide for bonded off Site storage and protection when Site does not permit on Site storage or protection.

4. Cover material and equipment subject to deterioration with impervious sheet covering. Furnish ventilation to avoid condensation or potential degradation of material and equipment.

5. Store loose granular materials on solid flat surfaces in a well-drained area. Avoid mixing with foreign matter.

6. Furnish equipment and personnel to store material and equipment by methods to prevent soiling, disfigurement, or damage.

7. Arrange storage of material and equipment to permit access for inspection. Periodically inspect to assure material and equipment are undamaged and are maintained in acceptable conditions.

8. After receipt of material and equipment, assume responsibility for loss and damage including but not limited to breakage, corrosion, weather damage, and distortion.

1.04 WARRANTIES

A. Provide warranties for equipment and material in accordance with Paragraphs 6.19 and 14.03 of the Standard General and Supplementary Conditions, if any.

B. Provide extended or special warranties as indicated in individual Specification sections.

END OF SECTION

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SECTION 01 70 00

EXECUTION AND CLOSEOUT REQUIREMENTS

PART 1 – GENERAL

1.01 SUMMARY

A. This Section specifies general execution requirements and startup/commissioning and performance testing for closeout of the Work. This Section applies to all Specifications and Drawings and provisions of this Section may be supplemented in other sections of Division 01.

B. Certain provisions required by Laws and Regulations may be referenced. Contractor is responsible to determine and obtain applicable Laws and Regulations and to review and interpret the full text of such Laws and Regulations.

C. Section Includes

1.02 OVERALL EXECUTION REQUIREMENTS
Coordination
Existing Conditions
Field Engineering
Cutting and Patching
Electrolytic Corrosion Prevention
Quality Assurance and Control of Installation
Manufacturers' Field Services
Independent Testing
Record Documents

1.03 STARTUP, TESTING, AND COMMISSIONING
Spare Parts
Consumables
Checkout and Starting Systems
Starting, Adjusting, and Balancing
Startup and Commissioning/Performance Testing
Demonstration and Training

1.04 CLOSEOUT REQUIREMENTS

1.02 OVERALL EXECUTION REQUIREMENTS

A. Coordination

1. Conduct preconstruction and pre-installation meetings before commencing certain Work that requires coordination or has special requirements or approvals.

2. Comply with the required Work sequence and coordination as may be specified in Summary of Work and reflect in the Project scheduling.

3. Coordinate Work such that Work is completed with minimum disruption to residents and businesses.

4. Coordinate space requirements and installation of Work. Utilize spaces efficiently to maximize accessibility for other installations, maintenance, and repairs.

    a. A primary Site restriction is the width of the streets and volume of traffic within the Project Site which may require complete shut down or partial blocking of the streets during construction. Coordinate with the Fire Department and Police Department.

5. Coordinate Work of the various Specifications with interdependent responsibilities for installing, connecting to, and placing in service, operating equipment.

6. Coordinate related Work at the Site in accordance with Article 7 of the Standard General and Supplementary Conditions, if any.

7. Coordinate completion and cleanup of Work of separate sections in preparation for Substantial Completion and for portions of Work designated for Owner's partial occupancy.

8. After Owner occupancy of premises, coordinate access to Site for correction of defective Work and/or incomplete Work to minimize disruption of Owner's activities.

9. Specific requirements applicable to the Project include the following.

    a. Coordinate with Owner and Engineer prior to performing any Work that will impact the water distribution system.

    b. Coordinate with the Conservation Commission prior to start of Work.

B. Existing Conditions

1. Paragraph 4.01 of the Standard General and Supplementary Conditions, if any, covers Availability of Lands.

2. Paragraph 4.02 of the Standard General and Supplementary Conditions, if any, covers Subsurface and Physical Conditions.

3. Pursuant to Paragraph 4.04 of the Standard General and Supplementary Conditions, if any, existence and location of Underground Facilities and other utilities and construction indicated as existing are not guaranteed. Before beginning Work investigate and verify the existence and location of Underground Facilities and other utilities and construction.

    a. Conduct test pits and other utility research and properly restore utilities interfered with or damaged during construction at no cost to the Owner.

    b. Engage a professional subsurface utility locator to verify the existence and location of underground utilities prior to starting Work.

    c. Contact DIGSAFE (www.digsafe.com) by dialing 811.

4. Paragraph 4.05 of the Standard General and Supplementary Conditions, if any, covers Reference Points.

5. Paragraph 4.06 of the Standard General and Supplementary Conditions, if any, covers Hazardous Environmental Conditions at Site.

C. Field Engineering: Not required for the Project.

D. Cutting and Patching

1. Employ skilled and experienced personnel to perform cutting and patching.

2. Submit written request in advance of cutting or alteration which affects:

    a. structural integrity of any element of Project;

    b. integrity of weather exposed or moisture resistant elements;

    c. efficiency, maintenance, or safety element;

    d. safety, traffic, or hazard barriers;

    e. visual qualities of sight exposed elements; and

    f. work of Owner or separate contractor.

3. Execute cutting, fitting, and patching including excavation and fill to complete Work and to:

    a. fit materials together, to integrate with other work;

    b. uncover Work to install ill-timed Work;

    c. remove and replace defective or non-conforming Work;

    d. remove Samples of installed Work for testing when requested; and

    e. provide openings in element of Work for penetration of mechanical and electrical work.

4. Execute Work by methods to avoid damage to other work and which will provide appropriate surfaces to receive patching and finishing.

5. Provide adequate temporary support for Work to be cut.

6. Restore Work with new materials in accordance with requirements of Contract Documents. Use materials identical with original materials where recognized that satisfactory results can be produced.

7. Provide protection from elements for areas which may be exposed by uncovering work.

8. Refinish surfaces to match adjacent finishes. For continuous surfaces, refinish to nearest intersection or natural break. For an assembly, refinish entire unit. Restore exposed finishes of patched areas; and, where necessary extend finish restoration onto retained adjoining Work in a manner, which will eliminate evidence of patching.

9. Identify any Hazardous Waste, Hazardous Environmental Condition, or hazardous substance exposed during the Work to Owner for decision or remedy in accordance with Paragraph 4.06 of the Standard General and Supplementary Conditions, if any.

10. Cut work by methods least likely to damage Work to be retained and work adjoining. Cut Work with sawing and grinding tools, not with hammering, chopping, or burning tools. Cut masonry and concrete materials with masonry saw or core drill. Do not use pneumatic tools without prior approval. Core drill openings through concrete Work. Adhere to mandatory cutback requirements when saw cutting concrete and roadway openings.

11. Do not cut and patch structural Work in a manner resulting in reduction of load-carrying capacity or load/ deflection ratio.

12. Fit Work tight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces. Maintain supports to ensure structural integrity of the Work. Provide devices and methods to protect other portions of Project from damage and seal voids. For interior work at penetrations of fire rated walls, partitions, ceiling, or floor construction, completely seal voids with fire resistant material, to full thickness of the penetrated element.

13. Do not cut and patch operational or safety-related components that reduce capacities to perform in manner intended. Do not cut and patch Work that reduces visual qualities. Remove and replace unsatisfactory cutting patching as directed by Engineer or Owner.

E. Electrolytic Corrosion Prevention

1. Prevent galvanic action, bimetallic corrosion, anodic or cathodic action, and electrolysis at all electrical grounds and for all galvanic scale (electromotive series or table of oxidation potentials). Do not allow contact of dissimilar metals further apart than 0.35 on the galvanic scale (electromotive series or table of oxidation potentials). The electrode potential of common metals is listed below.

	Electrode Potential Volts (Relative to Hydrogen)
Magnesium	+2.37
Aluminum	+1.70
Zinc+	+0.76
Chromium	+0.56
Iron and Steel	+0.44
Cadmium	+0.40
Nickel	+0.25
Tin	+0.14
Lead	+0.13
Copper	-0.34

2. Unless otherwise indicated, provide dielectric insulators between ferrous and nonferrous pipe and equipment.

F. Quality Assurance and Control of Installation

1. Monitor quality control of Subcontractors, Suppliers, manufacturers, material, equipment, services, Site conditions, and workmanship, to produce Work of specified quality. Conduct field quality control and testing specified.

2. Comply fully with manufacturers' installation instructions, including each step in sequence. If manufacturers' instructions conflict with Contract Documents, request clarification from Engineer before proceeding.

3. Comply with specified standards as a minimum quality for the Work except when more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.

4. Perform Work using persons qualified to produce workmanship of specified quality.

5. Install field Samples and mockups at the Site as required in Specifications for review. Acceptable Samples and mockups represent a quality level for the Work. Where field Sample or mockup is specified to be removed, clear area after field Sample or mockup has been accepted by Engineer or after Work is complete when mockup is to serve as a control reference.

6. Protect adjacent construction in accordance with Paragraph 6.13 of the Standard General and Supplementary Conditions, if any.

G. Manufacturers' Field Services

1. If required in the Specifications, arrange and pay for material or equipment Suppliers or manufacturers to provide qualified staff personnel (field representative) to perform the following services and services specified. Submit reports of activities, actions taken and test results to Engineer within 10 days of completion.

   a. Observe Site conditions, conditions of surfaces and installation, quality of workmanship.

   b. Report observations and Site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturers' written instructions.

   c. Assist with field assembly as required.

   d. Furnish, setup, and operate required test equipment and facilities.

   e. Perform and record results of manufacturer recommended inspections and tests, and tests specified for material and equipment.

   f. Be responsible for protection of material and equipment and safety of all personnel during testing.

   g. Perform any other services normally provided by field representative's company.

h. Instruct operating personnel in proper use of material and equipment.

i. Instruct and supervise field repairs before acceptance by Owner.

H. Independent Testing

1. Employ and pay for specified services of an independent firm in accordance with Paragraph 13.03 of the Standard General and Supplementary Conditions to perform inspection and testing as may be specified except where responsibility for a specific inspection or test is expressly allocated to Owner in the Specifications or by Laws and Regulations.

2. Reports will be submitted by the independent firm to Owner, in duplicate indicating observations and results of tests and indicating compliance or noncompliance with Contract Documents.

3. Inspection, testing, and source quality control may occur on or off the Project Site.

4. Cooperate with independent firm. Furnish samples of materials, design mix, equipment, tools, storage and assistance as requested.

5. Notify Owner and independent firm 24 hours before expected time for operations requiring services.

6. Make arrangements with independent firm and pay for additional Samples and tests required for Contractor's use.

7. Retesting required because of nonconformance to specified requirements will be performed by the same independent firm if instructed by Owner. Payment for retesting will be charged to Contractor by deducting inspection or testing charges from the Contract Price.

8. Testing or inspecting does not relieve Contractor from performing Work in accordance with requirements of the Contract Documents.

I. Record Documents

1. Provide record documents in accordance with Paragraph 6.12 of the Standard General and Supplementary Conditions, if any, and in accordance with Section 01 15 30.

1.03 STARTUP, TESTING, AND COMMISSIONING

A. Spare Parts

1. Provide spare parts required for construction, startup, testing and commissioning of the Work prior to achievement of Substantial Completion, including spare parts for flushing and consumable supplies such as bolts, nuts, gaskets, filters, insulating tape, etc., normally consumed in the startup, commissioning and testing.

2. If spare parts are to be purchased by Owner as specified, Contractor shall have the right to use the spare parts purchased by Owner provided that such spare parts are replaced prior to Substantial Completion at Contractor's expense. Replacement spare parts, replaced by Contractor, shall be new, unused and identical as the original spare part used.

B. Consumables

1. Provide initial fills of consumables including equipment lubricants, resins, chemicals, desiccants, and fuels. Provide subsequent fills if required during Warranty Period if acts or omissions of Contractor cause such consumables to require replacement.

2. Coordinate with Owner for consumables required.

C. Checkout and Starting Systems

1. Coordinate schedule for startup and operation of various equipment and systems with Owner.

2. Notify Owner 7 days before startup of each major piece of equipment or system, including a staffing request for Owner's operations and maintenance personnel required to adequately and safely support each specific start-up and operation activity.

3. Verify that each system or piece of equipment item has been assembled, constructed, or completed in accordance with the Contract and capable of functioning as intended.

4. Verify that each piece of equipment or system has been checked for proper lubrication, drive rotation, magnetic center alignment, belt tension, control sequence, or other conditions which may cause damage.

5. Verify that each piece of equipment or system has successfully completed construction testing and cold commissioning, including hydrostatic testing, loop checks, relay checks, calibration, and continuity checks and that all tests, meter readings, and specified electrical characteristics agree with those required by the equipment or system manufacturer.

6. Verify wiring and support components for equipment are complete and tested.

7. Execute start up under supervision of responsible manufacturers' representative or Contractor's personnel in accordance with manufacturers' instructions utilizing Owner's qualified operations and maintenance staff trained by Contractor.

8. When specified in individual Specification Sections, require manufacturer to provide field representative to be present at Site to inspect, check and approve equipment or system installation before start up, and to supervise placing equipment or system in operation.

D. Adjusting and Balancing

1. Supply necessary equipment, material, construction power, and consumables (except for those provided by Owner) needed to startup and fully test the Work and replenish the same until Substantial Completion is achieved. Contractor may utilize Owner's operating spare parts, such use requiring timely replacement at Contractor's expense.

2. Coordinate as required for conduct of independent testing.

3. Perform specified and required adjusting and balancing concurrently to the maximum extent possible on individual equipment and systems and prior to startup and commissioning/performance testing.

E. Startup and Commissioning/Performance Testing

1. Conduct startup and commissioning/performance tests to demonstrate the Work meets the requirements of the Contract Documents, satisfies the Owner's requirements, and is in accordance with Paragraph 14.04. of the Standard General and Supplementary Conditions, if any. Conduct testing in accordance with individual Specifications.

2. Prepare and submit a written startup and commissioning/performance testing procedures no later than 60 days prior to start of testing for review and final test procedures no later than 30 days prior to start of testing. Submit a staffing request for Owner's operations and maintenance personnel.

3. Calibrate test equipment and instrumentation on Site or provide acceptable certificate of calibration conducted within 30 days of testing.

4. Complete functional testing prior to initiating the startup and commissioning/performance testing as specified.

5. Complete specified startup and commissioning/performance tests prior to Substantial Completion. Owner and Engineer will witness Performance Testing. Notify Owner and Engineer in writing at least 7 days prior to starting any startup and commissioning/performance testing. Coordinate for witnessing of tests by required regulatory representatives.

6. Submit written test reports.

F. Demonstration and Training

1. Provide formal demonstration and training of Owner's personnel as specified in individual Specifications.

1.04 CLOSEOUT REQUIREMENTS

A. Substantial Completion shall have been achieved when the following has been completed and the requirements of Paragraph 14.04 of the Standard General and Supplementary Conditions, if any, have been met.

1. Work is complete, systems are successfully operating, and final testing has been successfully completed.

2. A full inventory of the spare parts and special tools purchased by the Owner are replenished and in the custody of the Owner.

3. The Site has been restored to the satisfaction of the Owner.

4. An inspection of the Work has been completed by the Engineer and the Owner.

5. An updated Punch List is provided.

6. The Contractor's written warranty and guarantee has been submitted as required by Paragraph 6.19.D. of the Standard General and Supplementary Conditions, if any.

7. A Certificate of Substantial Completion has been provided in accordance with Paragraph 14.04.C. of the Standard General and Supplementary Conditions, if any.

B. The Contractor shall have sole care, custody, and control of the Work until achievement of Substantial Completion. During the period between Substantial Completion and the date for Final Completion, Contractor shall be given access to correct items on the Punch List and achieve Final Completion.

C. The date of achieving Substantial Completion is the date set forth in the Certificate of Substantial Completion that is accepted and signed by the Owner.

D. Final Completion shall have been achieved when the Work is complete, the requirements of Paragraphs 14.06 and 14.07 of the Standard General and Supplementary Conditions, if any, have been met, and when the following is complete.

1. Substantial Completion has been achieved and liquidated damages for failure to meet Substantial Completion Date have been paid.

2. All Work including Punch List Items has been completed.

3. Final cleaning has been conducted and Contractor equipment and supplies including waste materials have been removed from the Site and legally disposed of.

4. A full set of record documents have been submitted as specified in subparagraph 1.02.I above and Contractor's written warranty and guarantee has been resubmitted if adjusted.

5. Inspections required by Laws and Regulations are complete. Certificates and permits to occupy and operate have been issued if required.

6. Spare parts, maintenance and extra materials have been delivered in quantities specified to Project Site and stored as directed.

7. A request for final inspection in accordance with Paragraph 14.06 of the Standard General and Supplementary Conditions, if any, has been submitted to the Engineer and the inspection has been completed and the results accepted by the Owner.

8. A Final Application for Payment has been submitted to the Engineer identifying total adjusted Contract Price, previous payments, and balance due along with required documentation in accordance with Paragraph 14.07.A. of the Standard General and Supplementary Conditions, if any.

END OF SECTION

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SECTION 02 61 05

REMOVAL AND DISPOSAL OF CONTAMINATED SOIL AND WATER

PART 1 – GENERAL

1.01 SUMMARY

A. Section Includes

1. Remove and dispose of contaminated soil and material generated during normal requirements for excavation including associated handling, transportation, and stockpiling of contaminated soil/material in conformance with Laws and Regulations.

2. Remove, treat and dispose of contaminated water generated during dewatering in conformance with Laws and Regulations.

B. Related Work

1. Section 31 00 00 – Earthwork

2. Section 33 14 11.01 – Water Utility Piping – Ductile Iron

3. Section 33 14 19 – Valves and Hydrants for Water Utility Service

4. Section 33 14 20 – Water Service Connections – Polyethylene

5. Section 33 14 21 – Water Service Connections – Copper

1.02 PRICE AND PAYMENT PROCEDURES

A. Measurement and payment requirements: per Division 01 General Requirements.

B. Conduct Work of this Section only after issuance of Change Order.

C. Excavation beyond that required to remove contaminated materials as specified and shown on the Drawings shall be considered additional Work.

1.03 REFERENCES

A. Reference Standards

1. Massachusetts Department of Environmental Protection (MassDEP)

a. 310 CMR 30.000 Hazardous Waste Regulations

b. 310 CMR 40.0000 Massachusetts Contingency Plan

2. Environmental Protection Agency (EPA)

3. Occupational Safety and Health Administration (OSHA)

a. OSHA 29 CFR 1926, Safety and Health Regulations for Construction

1.04 SUBMITTALS

A. Provide in accordance with Division 01 General Requirements.

B. Laboratory characterization results.

C. Three copies each of handling, transport and/or disposal documentation including bill of lading (BOL), disposal facility receipt, hazardous waste manifest

1.05 QUALITY ASSURANCE

A. Provide in accordance with Division 01 General Requirements.

B. Handle, transport and dispose of contaminated material in accordance with applicable Laws and Regulations.

C. Provide that workers performing removal and disposal of contaminated material are OSHA certified in accordance with OSHA 29 CFR 1926 for Work with or near hazardous materials, including completion of the 40-hour health monitoring program.

PART 2 – PRODUCTS

2.01 CARBON CANISTERS FOR WATER TREATMENT

A. Provide disposable, 55 gallon drum, liquid phase, granular activated carbon canisters. Acceptable level of quality: equivalent to Calgon.

PART 3 – EXECUTION

3.01 GENERAL

A. Comply with Paragraph 4.06.D. of the General Conditions and Supplementary Conditions (if any) if soil materials or water scheduled for removal within an excavation is suspected to be contaminated.

B. Perform Work where contaminated materials are discovered over consecutive Work days unless precipitation prevents it. Do not perform Work during periods of rain or other precipitation or threat of precipitation in areas where contaminated materials have been or are found. In the event that precipitation occurs during conduct of Work, cease Work and cover trenched area with polyethylene liners.

C. Pay for costs and fees arising from mishandling, improper disposal or use of faulty equipment associated with the removal of contaminated material and water at no additional cost to Owner.

D. Handle and transport contaminated material in accordance with applicable Laws and Regulations, including those of the DEP in the state where the Project is located.

3.02 CONTAMINATED SOIL AND MATERIAL

A. Provide excavation, temporary on-Site stockpiling, laboratory characterization, loading, and transportation (including stockpile management) of contaminated soil from each area of Work to a central stockpile location within the jurisdiction of Owner as specified by Owner.

B. Cover contaminated soils when transported on public ways to minimize release of dust.

C. Provide laboratory characterization required for soil management facility approval, soil management facility approval, handling, and transportation and disposal of contaminated material.

D. Arrange for legal disposal of the contaminated soil material at an authorized facility in accordance with 310 CMR 40.0030.

E. Temporary Stockpiling

1. Place contaminated soil generated from each area of Work into separate stockpiles at the central stockpile location. Mark each stockpile with location where contaminated soil was removed.

2. Place temporarily stockpiled contaminated soil at the central stockpile location on polyethylene sheeting of at least 6 mils in thickness. Immediately cover stockpiles with polyethylene sheeting of at least 6 mils or other suitable impermeable material with physical strength to resist tearing by the wind. Properly secure around the base.

3. Provide that slopes comply with OSHA Regulations and local codes and Laws and Regulations.

4. Maintain stockpiles at the central stockpile location. Check stockpiles daily during normal working hours and repair, replace or re-secure the sheeting to the satisfaction of the Engineer and Owner.

3.03 CONTAMINATED WATER

A. Use pumps and hoses of oil resistant material used for transfer of contaminated water. Ensure pumps and hoses are well maintained and allow examination by the Engineer. Replace or repair leaking pumps and hoses at no additional cost to the Owner. If the thickness is persistently greater than 1/2-inch, Owner or Engineer will notify DEP within 72 hours per 30 CMR 40.0313.

B. Off-Site Water Disposal

1. Pump contaminated water into either a vacuum truck operated by a licensed hazardous waste transporter (for volumes of water up to 3,000 gallons) or into portable, bulk liquid storage tank(s) for larger volumes and transport to an approved off-Site location for disposal.

2. Handle and transport contaminated water in accordance with applicable Laws and Regulations, including the DEP of the state where the Project is located.

C. On-Site Water Treatment and Disposal

1. Provide for on-Site handling, treating and disposing of contaminated water removed from excavations. Owner and Engineer will assist in obtaining an emergency NPDES exclusion permit for the disposal of treated water to a storm drain or waterway, if required.

2. Treat contaminated water by pumping through two consecutive liquid phase granular activated carbon canisters at a flow rate not exceeding 10 gallons per minute or as recommended by the manufacturer and as necessary to meet effluent limits. Provide pre-filtration of the water prior to carbon treatment if required in accordance with the manufacturer's recommendation.

3. Test effluent to ensure compliance with EPA drinking water quality standards or the effluent concentration requirements specified in the NPDES permit, if applicable.

a. Take samples at least once daily and submit to a qualified analytical testing laboratory for 24-hour turn around. Provide sample testing for the parameter(s).

b. Cease Work immediately if test results indicate the effluent exceeds the effluent concentration requirements and adjust flow and/or replace carbon canister to meet the effluent requirements.

c. Legally dispose of carbon canisters in accordance with Laws and Regulations.

END OF SECTION

SECTION 02 82 35

ASBESTOS CEMENT PIPE REMOVAL AND DISPOSAL

PART 1 – GENERAL

1.01 SUMMARY

A. Section Includes

1. Removal and legal disposal of asbestos cement (AC) pipe as may be required to complete the specified work in accordance with this Section and applicable reference standards listed in Article 1.03.

1.02 PRICE AND PAYMENT PROCEDURES

A. Measurement and payment requirements: per Division 01 General Requirements.

1.03 REFERENCES

A. Reference Standards

1. U.S. EPA Regulation 40 CFR Part 61 National Emission Standards for Hazardous Air Pollutants (NESHAP) Paragraph 61.145, Standard for Demolition and Renovation, and Part 763, Asbestos

2. U.S. Department of Labor; Occupational Safety and Health Act of 1970 (Particular attention is drawn to the Asbestos Regulations of 29 CFR, Part 1926.1101 General Industry Standard for Asbestos, Part 1910.134 Respirator Regulations, and Part 1910.1200 Hazard Communication Program)

3. U.S. Department of Transportation regulations, 49 CFR Parts 171-181; Hazardous Materials Regulations

4. Commonwealth of Massachusetts

   a. 453 CMR 6.00, Department of Labor Standards Asbestos Regulations

   b. MGL Chapter 149, Sections 6A-6G

   c. MGL Chapter 21E, *Massachusetts Oil and Hazardous Material Release Prevention and Response Act*

5. Massachusetts Department of Environmental Protection (Mass DEP)

   a. 310 CMR 7.00, 7.09, 7.15, 19.00, 22.00, 33.00, 40.00 and all related amendments and policy statements

b. Asbestos Cement Pipe Guidance Document latest version

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordination, Sequencing, and Scheduling: per Division 01 General Requirements.

1.05 SUBMITTALS

A. Submit in accordance with Division 01 General Requirements.

B. Submit Asbestos Notification Form, ANF-001 10 working days prior to beginning abatement activities to Owner and to Massachusetts Asbestos Program (see instructions at http://www.mass.gov/eea/agencies/massdep/air/programs/asbestos.html).

C. Asbestos Work Plan prior to commencement of removal of AC pipe including the following:

1. Notification procedures when asbestos concrete pipe is encountered

2. Worker training, certifications, personal protective equipment, and monitoring

3. Sequence of work and operating procedures for the excavation, removal, handling, storage and disposal of asbestos concrete pipe

4. Description of containment systems and or all other required work controls, methods, engineering controls and practices.

5. Copies of training, certifications and other credentials for workers who will be handling asbestos-cement pipe.

6. Emergency response procedures

7. Name, location and certification of proposed disposal location

D. Closeout and maintenance material submittals: per Division 01 General Requirements.

1.06 QUALITY ASSURANCE

A. Provide in accordance with Division 01 General Requirements.

B. Qualifications: per statutory requirements for licensed asbestos works.

C. Regulatory approvals: per statutory requirements and Department of Environmental Protection.

1.07 SITE CONDITIONS

A. Existing conditions: per Division 01 General Requirements.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.01 GENERAL

A. Provide that Work is performed by and under the direction of an asbestos abatement Subcontractor duly licensed per Laws and Regulations.

B. Provide that exposed asbestos cement pipe is handled in accordance with Laws and Regulations.

C. Provide that personnel handling AC pipe are trained and certified. Provide personal protective equipment to handle such material per Laws and Regulations.

D. Legally dispose of AC pipe per Laws and Regulations.

3.02 ATTACHMENTS

A. MassDEP Asbestos Cement Pipe Guidance Documents

END OF SECTION

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Commonwealth of Massachusetts
Executive Office of Energy & Environmental Affairs

Department of Environmental Protection
One Winter Street Boston, MA 02108 • 617-292-5500

ASBESTOS CEMENT PIPE GUIDANCE DOCUMENT

July 2019

Prepared by the Bureau of Air & Waste

This information is available in alternate format. Contact Michelle Waters-Ekanem, Director of Diversity/Civil Rights at 617-292-5751.
TTY# MassRelay Service 1-800-439-2370
MassDEP Website: www.mass.gov/dep

Printed on Recycled Paper

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I. Background

The Massachusetts Department of Environmental Protection's (MassDEP's) asbestos regulation (310 CMR 7.15) protects public health and the environment by establishing safe handling practices for demolishing or renovating buildings and structures to prevent the release of asbestos fibers from asbestos-containing materials (ACM). MassDEP's regulations require notification as well as specific removal, handling, and disposal requirements for all ACM. These work practices include removing ACM prior to demolition or renovation activities, wetting the ACM before it is removed to prevent the release of asbestos dust, fully containing the work area (e.g., with plastic sheeting) and drawing air out of the containment through an air filtration unit equipped with a HEPA filter capable of capturing asbestos fibers, sealing the wetted Asbestos-Containing Waste Material (ACWM) in leak-tight containers with asbestos labeling, and properly disposing of the waste in a landfill permitted to accept ACM or ACWM.

Asbestos cement pipes often are found in underground utility conduits and municipal water, sewer and drainage systems. Asbestos cement pipes buried below ground are considered non-friable if they are in good condition. It should be noted that active asbestos cement pipe that is exposed and is not intended to be replaced or removed and is not disturbed by repair or replacement activities may remain in place and be backfilled.

II. Purpose

This guidance document is based on the requirements in 310 CMR 7.15(12A) and explains how to safely remove, repair and dispose of asbestos cement pipes that are repaired or replaced in underground system networks owned by public and private utilities (e.g. water, sewer, electricity and gas). Its main purpose is to prevent the release of asbestos fibers into ambient air and to protect public health, safety, and the environment while removing, repairing and disposing of asbestos cement pipes.

This guidance document summarizes the requirements for underground asbestos-cement pipe that is owned by public and private utilities (e.g., pipes conveying drinking water, sanitary sewage, storm water, electricity, and gas).

This guidance document and 310 CMR 7.15(12A) only applies to asbestos-cement pipe. If at any time the owner or operator determines that the pipe they are repairing or replacing is not asbestos-cement pipe, they must comply with the applicable requirements of 310 CMR 7.15.

This document does not constitute "final agency action," and is not "regulation" as that term is used in M.G.L. c.30A. It may not be relied upon to create rights, duties, obligations or defenses, implied or otherwise, enforceable by any party in any administrative proceeding with the Commonwealth. In addition, this guidance does not exempt anyone from complying with any other applicable local, state or federal law,

including but not limited to: the United States Environmental Protection Agency (EPA) Asbestos National Emission Standards for Hazardous Air Pollutants (Asbestos NESHAP) regulation at 40 CFR part 61; the applicable United States Occupational Safety & Health Act (OSHA) standards at 29 CFR 1910 & 1926; and the Massachusetts Department of Labor Standards (DLS) regulation at 453 CMR 6.00.

III. Guidance Provisions

a. Pre-Demolition/Renovation Survey

MassDEP's asbestos regulation establishes that owners and operators (including contractors) are responsible for determining whether cement pipe in a particular utility conduit that will be repaired or replaced contains asbestos before starting demolition or renovation.

The methods described below can only be used at underground asbestos-cement pipe repair/replacement work conducted by public and privately-owned utilities or their contractors. Owners and operators who are not public or private utilities are subject to the survey requirements at 310 CMR 7.15(4) by employing or engaging an asbestos inspector to thoroughly inspect the pipe, including sampling and analysis for the presence of asbestos using approved EPA protocol.

An owner or operator (including utilities conducting pipe repair or replacement), must conduct a "thorough inspection" to determine the location and amount of any asbestos-containing pipe. A "thorough inspection" under 310 CMR 7.15(12A) shall be satisfied by one of the following three options:

- Document Review: The owner or operator shall review as-built plans or other documents identifying the content of particular cement pipes or pipe segments and any other material in the conduit that may be affected by a removal or repair project, provided that the documentation has been updated to reflect any repairs or alterations. "Other documents" may include analytical results from bulk sampling and asbestos analysis using an EPA-approved method, a manufacturer's Safety Data Sheet for the product as actually installed, or other irrefutable identifying information.

- Visual Observation: A person who has successfully completed a DLS-approved training course specific to asbestos cement pipe worker safety (e.g., the "8 hour OSHA Class II Asbestos Training: Asbestos Cement Pipe (ACP) Worker Safety" course) or another course similar in length and content that has been reviewed and approved in writing by DLS shall conduct a visual identification through field observations of the pipe to be worked on (e.g., the manufacturer's brand-label markings indicating transite material or

the source of the pipe).

- Presumption of Asbestos Containing Material: The owner or operator may presume that a pipe or pipe segment contains asbestos and manage any repairs or removals in accordance with this guidance and 310 CMR 7.15(12A).

If the pipe or pipe segment is not identified as asbestos cement pipe by one of the options listed above, then the owner or operator shall comply with the requirements of 310 CMR 7.15(4) by performing a survey if the pipe contains suspect asbestos-containing material.

The owner/operator of the utility system at which the asbestos cement pipe was removed, repaired or replaced must keep documentation of the pre-demolition/renovation survey, signed and dated by the person who conducted the inspection, for a minimum of two (2) years in the project file. The documentation must indicate what information was relied upon to determine whether the pipe contained asbestos. (See Attachment A for a Pre-Demolition/Renovation Survey Documentation template.)

b. Notification

A notification must be submitted to MassDEP for each asbestos-cement pipe project on an Asbestos Notification Form ANF-001/BWP AQ-04 in accordance with 310 CMR 7.15(6). The notification must be submitted at least ten (10) working days before starting asbestos cement pipe removal. The ANF-001/BWP AQ-04 and answers to frequently asked questions about filing notifications are available at:
https://www.mass.gov/how-to/aq-04-anf-001-asbestos-removal-notification
The asbestos notification is filed online using MassDEP's online notification system, eDEP: https://edep.dep.mass.gov/

If you cannot wait the requisite 10 working-day notification period prior to starting work, you will need to request an emergency waiver from the MassDEP regional office that covers the town in which the project is located. (See the response to question number 4 in the "Frequently Asked Questions" section of this guidance document for more details on how to obtain an emergency waiver.) The MassDEP staff person who approves an emergency waiver will provide a project-specific waiver number that must be entered on the notification form in the relevant field.

A notification fee, currently $100.00, is required when filing an ANF-001/BWP AQ-04. However, asbestos abatements at property owned by cities, towns, counties, districts of the Commonwealth, municipal housing authorities, federally recognized Indian tribe housing authorities, state agencies, the

Massachusetts Bay Transportation Authority, and owners of owner-occupied residential properties with four or fewer units are exempt from this fee.

Owners and operators who are planning to remove or repair several pipe segments over a specific period of time may apply to MassDEP for approval of a "blanket notification", which would cover the entire project for a time period not to exceed one (1) year. While individual ANF-001/BW AQ-04 forms would still need to be submitted for each segment of the work, the blanket approval would eliminate the ten working day advance notification requirement for the individual filings. Information regarding asbestos blanket notifications may be found at:
https://www.mass.gov/how-to/aq-05-asbestos-blanket-notification-approval
An application fee of $200 is required for each application for a blanket notification approval.

c. Licensing and Training

DLS's regulation (453 CMR 6.00) establishes requirements for the use of contractors and other asbestos specialists who are licensed or certified by that Department. Please call DLS for all licensing and training questions. Contact information can be found in the response to Question 28 in the attached Frequently Asked Questions.

In lieu of hiring a DLS-licensed asbestos contractor, an owner or operator conducting asbestos abatement activity on underground asbestos cement piping may hire contractors or other entities who have completed the "8 hour OSHA Class II Asbestos Training: Asbestos Cement Pipe (ACP) Worker Safety" course developed jointly by the MWWA and UCANE, or a course similar in length and content reviewed and approved in writing by DLS, provided that the owner, operator and contractor comply with the provisions and procedures described in this guidance document. To maintain one's qualification, DLS requires that the contractor or other entity must complete 4-hour ACP Worker Safety Refresher Training at least every 5 years after the initial training.

d. Specific Work Practice Requirements for Underground Asbestos-Cement Pipe.

Owners/operators shall ensure the work practice standards listed below are followed:

1. Asbestos-cement pipe shall be handled in a manner that will minimize the risk of making it friable ACM or releasing asbestos dust into the environment.
2. At the start of work involving asbestos-cement pipe, owners/operators shall ensure that:
   a. The asbestos-cement pipe shall be exposed with minimal disturbance.
   b. Mechanical excavation shall not be used within six inches of the asbestos-cement pipe.

c. The soil within six inches of the asbestos-cement pipe shall be uncovered by hand or with a shovel.
d. Once the pipe has been exposed, an assessment shall be made before proceeding to determine whether the asbestos-cement pipe is damaged, cracked or broken to determine whether the requirements of Section III.d.3. or 4. (below) apply to the asbestos abatement activity.

3. If the assessment shows that the asbestos-cement pipe is intact and not deteriorated:
   a. Place 6 mil (0.006 inch) thick polyethylene sheeting under the asbestos cement pipe to prevent soil contamination.
   b. Adequately wet the asbestos-cement pipe with amended water using surfactant or liquid soap before and during removal to avoid creating airborne dust.
   c. Separate the asbestos cement pipe at the nearest coupling (bell or compression fitting).
   d. Slide the asbestos-cement pipe apart at the joints (no saw cutting) or use other methods that do not cause the asbestos-cement pipe to break, become friable ACM or otherwise create the potential to release asbestos fibers.
   e. Wrap wet asbestos cement pipe in two layers of 6 mil polyethylene sheeting, seal with duct tape and label (This may be done either in the trench or adjacent to the trench). Package any other asbestos-containing debris from the abatement in accordance with 310 CMR 7.15(7)(f)(3) – e.g., while wet, place debris in two plastic bags (six-mil minimum thickness each bag, one inside the other) or in leak-proof metal, plastic or plastic lined drums with locking lids.
   f. If the trench is filled with water, the placement of polyethylene sheeting is not required.
4. If the asbestos-cement pipe is deteriorated or is not intact, or when the use of mechanical breakage with saws, snap or blade cutting, and/or tapping is necessary:
   a. Place 6 mil (0.006 inch) thick polyethylene sheeting under the asbestos-cement pipe to prevent soil contamination.
   b. Adequately wet asbestos-cement pipe with amended water where cutting or breaking will occur.
   c. Saw cutting of asbestos-cement pipe shall only be conducted with a HEPA-shrouded vacuum attachment or wet cutting equipment, unless it is conducted within a small enclosure that isolates the area in which the saw cutting is being conducted to prevent the release of asbestos fibers to ambient air.
   d. Wrap wet asbestos cement pipe in two layers of 6 mil polyethylene sheeting, seal with duct tape and label (This may be done either in the trench or adjacent to the trench). Package any other asbestos-containing debris from the abatement in accordance with 310 CMR 7.15(7)(f)(3) – e.g., while wet, place debris in two plastic bags (six-mil minimum thickness each bag, one inside the other) or in leak-proof metal, plastic or plastic lined drums with locking lids.

5. For activities that disturb friable ACM, no visible emissions shall be discharged to the outside air during the collection, processing, packaging or transporting of any ACM or ACWM.
6. Refer to Section "III.e." of this guidance document for packaging, labeling, disposal, and record retention requirements.

e. Packaging, Labeling, Disposal and Record Retention

All ACWM must be packaged, labeled, transported, stored and disposed of in accordance with requirements specified at 310 CMR 7.15(15): Asbestos-containing Waste Material Packaging Requirements, 310 CMR 7.15(16): Asbestos-containing Waste Material Transport Requirements, 310 CMR 7.15 (17): Asbestos-containing Waste Material Storage and Disposal Requirements, 310 CMR 7.15(18): Waste Shipment Records and Reports, and 310 CMR 19.061: Special Waste, including but not limited to the following:

i. Place properly wrapped and labeled ACWM pipe as well as all other packaged ACWM and debris in a roll-off container(s), or covered trucks, trailers or vans that are lined with 2 layers of 6 mil polyethylene sheeting.
    a. The container shall be an enclosed and sealed leak-tight container having proper labels and U.S. Department of Transportation placards as required.
    b. If open-top roll-off containers are used, they must be properly sealed, labeled and secured inside a locked fenced area when they are not being loaded to prevent access by unauthorized personnel, and covered to prevent water accumulation.
ii. Package, transport and dispose of ACWM in accordance with local, state, and federal regulations.
iii. Complete waste shipment records must be retained for 2 years by the owner/operator of the facility that generated the ACWM.
iv. Dispose of ACWM at a landfill permitted to accept ACWM.

Please note: "Bulk Loading"[1] of ACWM is not permitted without written approval from MassDEP - via approval of a Non-Traditional Asbestos Abatement Work Practice Application. (See BWP AQ-36 "Application for Non-Traditional Asbestos Abatement Work Practice Approval" https://www.mass.gov/how-to/aq-36-non-traditional-asbestos-abatement-work-practice-approval for information about how to apply for this permit.) Loading operations involving waste generated from asbestos cement pipe removal that is handled, packaged, labeled, containerized and stored/disposed of in accordance with Sections III.d. and III.e. of this guidance are not considered bulk loading

[1] "Bulk Loading" means the placement of unconfined ACWM in a vehicle or container, such as a roll-off, dumpster or truck *in lieu* of packaging the ACWM in individual leak tight containers.[310 CMR 7.15(1) Definitions

and do not require a Non-Traditional Asbestos Abatement Work Practice Approval.

f. Visual Inspection Requirement

When asbestos cement pipe removal is repaired or replaced, the final visual inspection shall be performed by a person who has completed a DLS-approved training course specific to asbestos cement pipe worker safety (e.g., the "8 hour OSHA Class II Asbestos Training: Asbestos Cement Pipe (ACP) Worker Safety" course), or another course similar in length and content that has been reviewed and approved in writing by DLS).

The person conducting the final visual inspection shall:

a. Inspect the work area to ensure there was no visible debris remaining:
   i. In the excavation trench;
   ii. In soil excavated from the trench;
   iii. In the surrounding area adjacent to the trench after the removal of the asbestos cement pipe, and
   iv. On any tools used during the removal/repair/replacement activities.
b. Ensure that all ACWM has been removed for proper storage/disposal.

The person who conducted the final visual inspection shall sign and date the documentation of the final inspection, in a format provided by the Department, as evidence that the inspection was performed and that the condition of "no remaining visible debris" was met. Owners/operators shall keep such documentation at their regular place of business for two (2) years from the date of final visual inspection and provide it to the Department upon request. (See Attachment B for an example of a Post-Abatement Visual Inspection template.)

Frequently Asked Questions About Asbestos Cement Pipe Removal

1. What is Asbestos? Is it hazardous to your health?

Asbestos is a naturally occurring fibrous mineral consisting of any one of a number of silicates. Asbestos has been and is still used in a variety of products because of its physical properties, which make it resistant to heat, fire, and many caustic chemicals. Asbestos has been used extensively as fireproofing, an insulating agent, and for decorative purposes, among many other uses.

The physical properties that give asbestos its resistance to heat and decay are linked with several adverse human effects. Asbestos tends to break into a dust of

microscopic fibers. Because of their size and shape, these tiny fibers can remain suspended in the air for long periods of time and can easily penetrate bodily tissue when inhaled or ingested. Because of their durability, these fibers can remain in the body for many years.

Asbestos is known to cause asbestosis and various forms of cancer. **Asbestosis** is a chronic disease of the lungs that makes breathing progressively more difficult, and can lead to death. Cancer can result from breathing asbestos fibers and **lung cancer** is the most frequent. **Mesothelioma**, an incurable cancer of the chest and abdominal membranes, almost never occurs without exposure to asbestos. Asbestos-related diseases have a long latency period and may not show up until 10 to 40 years after exposure. Each exposure increases the likelihood of developing an asbestos-related disease.

2. How do I know whether cement pipes contain asbestos?

Cement pipes used for public drinking water, waste water, roof drains or underground conduits may contain asbestos and should be handled in accordance with MassDEP's asbestos regulation (310 CMR 7.15) and the specific "Requirements for Underground Asbestos-Cement Pipe" (310 CMR 7.15(12A) unless the owner possesses documentation based on sampling and analysis, in accordance with approved EPA test methods, that has shown that they do not contain asbestos. It is the obligation of anyone removing or repairing materials that contain asbestos to handle them in accordance with applicable laws and regulations. Ignorance or avoidance of this responsibility does not remove this obligation.

Up-to-date as-built plans, reviewed by the owner/operator, that accurately identify the material that pipes or pipe segments are made of can be relied on to confirm that the pipe contains asbestos.. Another acceptable method for determining whether a pipe or pipe segment contains asbestos is through visual identification in the field at the time of excavation, when the pipe material is readily identifiable by observing the manufacturer's brand-label (e.g. Johns-Manville Transite) or other markings on the pipe (e.g., indicating its source). This identification must be done by a person who has completed a DLS-approved training course specific to asbestos cement pipe worker safety (e.g. the "8 hour OSHA Class II Asbestos Training: Asbestos Cement Pipe (ACP) Worker Safety" course) or another course similar in length and content that has been reviewed and approved in writing by DLS). If up-to-date as-built plans are not available and a definitive visual identification cannot be made, the owner/operator can presume the cement pipe contains asbestos and handle it in accordance with this guidance.

3. Does MassDEP have to be notified prior to beginning an asbestos cement pipe removal or repair project?

Yes, the owner/operator of a facility containing asbestos cement pipes must notify MassDEP ten working days before removing or repairing asbestos cement pipes. Notification is required no matter who is doing the removal/repair or how much

asbestos cement pipe is being removed or repaired. Please note that notification is required for repairs of asbestos cement pipe using tools that are considered "non-destructive" or "fail-safe" such as metal compression patches, wet tapping, etc. (See response to Question number 4 below for how to satisfy the notification requirement in the case of an emergency situation.)

4. We have an emergency and the pipe(s) need to be repaired immediately. Can we make the necessary repairs prior to submitting notification to MassDEP?

Yes, if MassDEP grants you an "emergency waiver." Work can be performed right away by calling the appropriate regional MassDEP office and obtaining an emergency waiver of the ten (10) working day waiting period. To identify the regional office for the town in which your project is located, please go to the MassDEP website at the following URL: https://www.mass.gov/service-details/massdep-regional-offices-by-community. Simply call the service center and ask for the asbestos program staff, or call the asbestos program staff member listed in response to FAQ number 27 below. The MassDEP staff person who approves an emergency waiver will provide a project-specific waiver number that must be entered on the notification form in the relevant field.

If the emergency occurs after business hours or on a weekend, leave a detailed message including your contact information on voice mail for the MassDEP asbestos inspector's voice mail and proceed with the repairs as detailed in this document. You should then follow up with MassDEP on the following business day. You will still be required to submit an asbestos notification form ANF-001/BWP AQ-04 within 24 hours of the removal.

In addition, you can conduct the work without the required ten working day notification period if you have a MassDEP approved asbestos blanket notification. Information regarding asbestos blanket notifications may be found under the heading "BWP AQ 05 - Application for Asbestos Blanket - Form and Guidance" at the following link: http://www.mass.gov/eea/agencies/massdep/service/approvals/bwp-aq-05.html.

5. Is there a notification form I should use?

Notification for asbestos cement pipe removal must be made by completing and submitting to MassDEP the MassDEP-approved Asbestos Notification Form ANF-001 (also known as BWP AQ-04). The Asbestos Notification Form is available on MassDEP's web site at http://www.mass.gov/eea/agencies/massdep/service/approvals/bwp-aq-04-anf-001.html . The asbestos notification can be filed online via MassDEP's website. See question number 10 below.

6. When must the notification be submitted?

The regulations require that the notification must be submitted at least ten working days in advance of the start of the asbestos cement pipe removal project. “Working days” do not include Saturdays, Sundays, or any day that MassDEP offices are closed for business, such as legal holidays.

7. When does the ten working day waiting period begin and end?

Your 10 working day waiting period will start when you submit your form, and you will receive an automatic notification that the submittal was received.

Please note that you must start work on the “start date” and end on the “end date” you indicate on the ANF-001. If you change the start date, you must revise your notification prior to the original start date indicated and allow for a full ten-day waiting period prior to the revised start date. If you need to start work sooner than ten days before the revised start date, call the MassDEP regional office to request an emergency waiver of the ten-day waiting period. (See Emergency Waiver information found at FAQ no. 4.) If you start and end work on the dates indicated in the original notification, but work intermittently within that period, that does not require a revision - simply notify the MassDEP regional office which days will not be performing work.

8. Will I be notified when I can begin the work?

No. Unless MassDEP contacts you with a statement of deficiencies about your notification, you can begin work on the "project start date" you entered on the Asbestos Notification Form ANF-001. When completing the ANF-001, be sure that the "project start date" falls on or after the 10 working day wait period.

9. Is a fee required for filing an asbestos notification?

The notification fee required by MassDEP regulations (310 CMR 4.00: Timely Action Schedule and Fee Provisions) for asbestos removal is $100 per notification. A notification revision requires re-filing the notification and payment of a $35 fee.

Please note: owners of owner-occupied residential properties with four or fewer units, cities, towns, counties, districts of the Commonwealth, municipal housing authorities, federally recognized Indian tribe housing authorities, state agencies and the MBTA are not subject to the asbestos notification fee. However, state agencies are subject to fees greater than $100 (e.g., the $200 Blanket Notification Approval application fee).

10. How do I submit the ANF-001 to the MassDEP?

Notification must be made on a current version of the MassDEP Asbestos Notification Form (ANF-001), which satisfies the requirements of both MassDEP and

DLS regulations (See: https://www.mass.gov/how-to/aq-04-anf-001-asbestos-removal-notification.) Follow these steps:

1. If you have not already done so, register online with https://edep.dep.mass.gov/edep/. Select "New User" and complete the required steps. It should take no more than five minutes to complete the registration process, and you can begin online filing of your notifications right away.

2. The eDEP Asbestos Notification Form and Instructions are available are available at: https://www.mass.gov/guides/massdep-asbestos-construction-demolition-notifications

3. When filing via eDEP, you will pay the fee online using a credit card. Please note that "fee decals" are no longer sold and cannot be used to file online.

4. When filing electronically through eDEP, your 10-working day waiting period will start when you submit your form, and you will receive an automatic notification that the submittal has been recorded.

Troubleshooting

If you get an error message after you click "Error Check & Next" at the end of the form that says "License # is not recognized," please check to make sure you typed the DLS License and Certification Numbers for the asbestos contractor, on-site supervisor/foreman, project monitor, and asbestos analytical lab number correctly. (Please note: Only fill in the fields for the DLS license/certification #'s for questions 6-9 in Section A of the form. The fields with the corresponding names and addresses will be pre-populated when you click "Error Check & Next.")

If the project does not require the use of a DLS-licensed asbestos contractor, then simply check off the appropriate boxes on the BWP AQ04 (ANF-001) PreForm and when you click "Error Check & Next," it will automatically pre-populate the asbestos contractor and asbestos supervisor fields (i.e. questions 6 and 7) to reflect work by a "Non Licensed Removal." For the project monitor and analytical lab information (i.e. questions 8 and 9) for this type of "Non Licensed Removal" situation, you can enter the DLS certification number in the appropriate data field if one of those disciplines will be used on the project. Or if those disciplines will not be used, then you can simply enter "N/A" in the DLS Certification data fields and leave the "Name" data fields blank.

If you still get an error message pop-up box, please contact the MassDEP data systems group: BAW.eDEP@state.ma.us

eDEP Features

Use of the eDEP online notification system ensures that you are using the most current form, and that you have provided all required information. Filing your ANF-001 Notification online via eDEP helps avoid common mistakes. Furthermore, electronic filers can see all of the Construction/Demolition Notification Forms they have submitted on-line by clicking on the "My eDEP" tab in the upper left corner of your log-in screen. In the event that either the project start date or end date changes, triggering the requirement to file a notification revision, the simplest way to do this is by filing a notification revision online via eDEP. (See Question 10 for more information on filing notification revisions.)

If you are unable to use the eDEP online notification system to file your ANF-001, you may file an alternate format (e.g. a paper version of the ANF-001) by emailing a request to BAW.eDEP@state.ma.us. Please include a phone number where you can be reached so that MassDEP can help you in your request. If you have any questions or desire further information about filing electronically through eDEP, please email your inquiry to BAW.eDEP@state.ma.us.

11. Do I need to notify other government agencies in addition to the MassDEP?

You may be required to notify the local Building Department, Fire Department, or Board of Health in the city or town where the asbestos is being removed. Always contact local officials to ask what notification or permits are required. Submittal of a complete ANF-001 to MassDEP satisfies **state** (both MassDEP and DLS) and **federal** notification requirements (e.g., EPA Asbestos NESHAP) for projects that will remove or disturb asbestos-containing material.

12. Do I need to hire an asbestos contractor to repair and/or remove asbestos cement pipe?

DLS's regulation (453 CMR 6.00) establishes requirements for the use of contractors and other asbestos specialists who are licensed or certified by DLS. Please call DLS for all licensing and training questions. Contact information can be found in the response to Question 28 in the attached Frequently Asked Questions.

In lieu of hiring a DLS-licensed asbestos contractor, an owner or operator conducting asbestos abatement activity on underground asbestos cement piping may hire Contractors or other entities who have completed the "8 hour OSHA Class II Asbestos Training: Asbestos Cement Pipe (ACP) Worker Safety" course or a course similar in length and content reviewed and approved in writing by DLS, provided that the owner, operator and contractor comply with the provisions and procedures that are described in this guidance document.

13. Can I crush the asbestos cement pipe in the trench and place new pipe over it?

No, crushing an asbestos cement pipe and leaving it in the trench is prohibited under 310 CMR 7.15. Further, the EPA has determined that backfilling and burial of the crushed asbestos cement pipe would cause these locations to be considered active disposal sites and therefore subject to the "Standard for Active Waste Disposal Sites" (40 CFR 61.154).

14. Can I "ream" or "pipe burst" new water supply pipe through existing asbestos cement pipe?

No, this is not allowed because reaming or pipe bursting through an existing asbestos cement pipe would cause the existing asbestos cement pipe to become crushed and "friable" (see response to question number 13 above).

15. What if the trench is filled with water which prevents the placement of polyethylene sheeting below the asbestos cement pipe (as required in Section IV.d. – Handling Practices)?

If the trench is filled with water, the placement of polyethylene sheeting is not required, as stated in Section III.d – Specific Work Practice Requirements. However, any visible debris must be managed in accordance with the requirements of Section III.e. – Packaging, Labeling, Disposal and Record Retention and III.f. – Visual Inspection Requirement.

16. What should I do with the water in the trench?

For work on the intact asbestos cement pipe(s), first try to pump the water out to a storm drain prior to any work. If there is substantial damage to the asbestos cement pipe and there are numerous pieces immersed in standing water, then the contaminated water should be pumped out and filtered through a 5 micron filter before the water is discharged.

17. Am I required to remove asbestos cement pipe that will not be disturbed by repair or replacement activities?

MassDEP only requires the removal of asbestos cement pipe that is exposed and will be disturbed during repair or replacement activities.

When a section of asbestos cement pipe is being repaired or replaced, the remaining portions of that pipeline are not required to be removed, provided that they are not exposed by excavation activity.

Additionally, if a section of asbestos cement pipe that is being actively used (e.g., a utility conduit) is exposed by excavation but will not be impacted by the repair or replacement work, it may be left in place and backfilled.

18. Where can I obtain the packaging and labeling materials?

The MassDEP-required asbestos warning labels and asbestos waste bags may be obtained from industrial supply houses, insulation supply houses, or may be purchased directly from licensed asbestos contractors. Polyethylene sheeting and duct tape are widely available from hardware, home supply and other stores.

19. Can I store waste asbestos cement pipe?

Asbestos cement pipe waste material that has been properly wetted, packaged in sealed, leak-tight containers, and labeled can be temporarily stored for up to thirty (30) days at a secure location on property owned or controlled by the owner or operator of the public/private utility system or at the place of business of the company/contractor removing asbestos-cement pipe from its site of origin. The storage location must be secured (e.g., storage in a locked fenced-in area) and maintained in accordance with all federal, state and local requirements. Contact local officials to determine if temporary storage of asbestos cement pipes is allowed in your municipality.

20. Can I store unused "virgin" asbestos cement pipe?

Unused (i.e. "virgin") asbestos cement pipe that is still suitable for use is not considered an ACWM, and is therefore not subject to the ACWM storage limitations. Measures should be taken to ensure that stored virgin asbestos cement pipe does not become deteriorated by constant exposure to the elements. If virgin asbestos cement pipe deteriorates so that it is no longer suitable for use, then it would be considered ACWM and subject to all the applicable packaging, labeling, storage and disposal requirements at 310 CMR 7.15(15) – (18).

21. Can I dispose of the asbestos cement pipes with my other solid waste?

No. The asbestos cement pipes must be managed as a "Special Waste" (requiring proper packaging, labeling, and disposal) and in Massachusetts may only be disposed of at a facility that is permitted to accept ACWM under 310 CMR 19.061 ("Special Waste" regulation).

22. How can I find a place to dispose of the asbestos cement pipes?

The best option is to hire a waste hauler or asbestos contractor to transport the asbestos cement pipes to a disposal facility. Many waste haulers and asbestos contractors are familiar with various disposal facilities and frequently transport wastes to facilities permitted to accept ACWM.

You also can contact a landfill directly and arrange to transport the waste to the landfill yourself. ACWM can only be disposed at a solid waste landfill permitted to accept "Special Waste", which in Massachusetts must be operated in accordance with regulatory requirements specified at 310 CMR 19.061, or in another state, in

accordance with the relevant "Special Waste" permit requirements. You should contact the facility in advance of transporting ACWM for disposal.

ACWM may not be sent to an incinerator or to a construction and demolition (C&D) debris processing facility in Massachusetts. Likewise, no Massachusetts transfer stations are permitted to accept ACWM.

23. How do I find an asbestos waste hauler?

Asbestos waste haulers may be located by using any available internet search engine or by looking this topic up in the Yellow Pages. Try entering/looking under topics such as "rubbish," "waste" or "asbestos." Any firm hauling ACWM must be registered with the Federal Highway Administration's Motor Carrier Division. Call the nearest regional MassDEP office for additional help.

24. Can I transport the waste asbestos cement pipes myself?

Waste asbestos cement pipe that has been packaged and labeled in accordance with Section III.e. – Packaging, Labeling, Disposal and Record Retention, may be transported in a covered truck, trailer or van to a secured, temporary storage location at property owned or controlled by the pipe owner or operator or at the place of business of the company/contractor that removed the asbestos-cement pipe from the excavation, as outlined in question 19. If a van is used, the waste asbestos cement pipe should be transported in a compartment separate from the driver or passenger seats. A pickup truck bed should be covered with an impermeable tarpaulin cover and secured so that it does not allow the accumulation of rain water. The waste containers should not be loaded above the side rails in any truck or trailer.

25. Is there any paperwork required for transporting the waste asbestos cement pipes?

Yes. 310 CMR 7.15(18): Waste Shipment Records and Reports requires that an asbestos Waste Shipment Record (WSR) document accompanies each shipment of ACWM. Waste hauling companies and/or asbestos removal companies can supply WSR forms. (A template for the WSR form is available at: https://www.mass.gov/guides/massdep-asbestos-construction-demolition-notifications). The WSR must be signed by each company or person involved with removal, transportation and disposal of the ACWM, including the facility owner or "generator" of the asbestos. The asbestos removal contractor may sign on behalf of the owner.

Pursuant to 310 CMR 7.15(18), if a completed copy of the WSR, signed by the disposal facility to acknowledge receipt of the waste shipment, is not received back by the generator within 35 days of the initial shipment, the generator must contact the transporter or disposal facility to determine the status of the waste shipment. This section of the regulation also requires the generator to notify the MassDEP regional office in writing if the generator does not receive a signed copy of the WSR from the disposal facility within 45 days of the date of shipment. The generator, the transporter, and the disposal facility must each retain a copy of the WSR signed by all

the parties for at least two years. You do not need to send a completed copy of the WSR to any regulatory agency, but MassDEP may request a copy of the WSR from any of the parties in the event of an inspection.

Additionally, transportation of asbestos (which is designated as a hazardous material for transportation) is regulated by the U.S. Department of Transportation (US DOT), which has established requirements for shipping documents, packaging, labeling, and vehicle placarding (49 CFR 173.1090): asbestos must be loaded, handled and unloaded in a manner that will minimize occupational exposure to airborne asbestos fibers released during transit. US DOT also requires that transporters carry identification papers for all quantities of asbestos greater than 1 pound. The Massachusetts state police enforce this requirement.

26. Does MassDEP have a document containing general information about asbestos?

Yes. The "Asbestos Information and Resource Guide" is available https://www.mass.gov/guides/massdep-asbestos-construction-demolition-notifications. The guide includes contact information for various government agencies responsible for asbestos, a list of regulations governing asbestos, and general information about asbestos and asbestos removal.

27. How do I contact MassDEP for more information?

For more information on asbestos or other environmental issues, please visit MassDEP's website at www.mass.gov/dep/about/contacts.htm or contact the following MassDEP officials:

Boston: (For general information about asbestos policy/regulation and notification/fees) Mike Elliott at 617-292-5575 or michael.elliott@mass.gov

Central Region: Gregg Levins at 508-767-2768 or gregory.levins@mass.gov

Northeast Region: John MacAuley at 978-694-3262 or john.macauley@mass.gov

Southeast Region: Cynthia Baran at 508-946-2887 or cynthia.baran@mass.gov
Emergency Waiver Hotline: 508-946-2882

Western Region: Marc Simpson at 413-755-2115 or marc.simpson@mass.gov

28. How do I contact Massachusetts DLS?

For information about DLS asbestos training, certification and/or licensing, contact:

Massachusetts Department of Labor Standards/Asbestos Program
Charles Hurley Building
19 Staniford Street, 2nd Floor
Boston, MA 02114
Phone:617-626-6960, Fax: 617-626-6965, Web: www.mass.gov/dols

Template A: Pre-Demolition/Renovation Survey Documentation

1. Project Location:

_____
(Street address, GPS coordinates or other location identification)

City/Town: _____, MA

2. Pre-Demolition/Renovation Survey Survey Date: _____

MassDEP's asbestos regulation requires owners and operators (including contractors) to determine whether cement pipe in the utility conduit that will be disturbed contains asbestos. Please identify the information that was used to determine whether the pipe at this location contains asbestos by checking all applicable boxes:

☐ Accurate, up-to-date as-built plans or other utility network documents. Specify title and revision date of the as-built drawing or other documentation:

_____

☐ Visual identification/ field observations of exposed pipe. Specify manufacturer's brand-label marking (e.g. "Johns-Manville Transite") or other features used to identify composition/source of pipe:

_____

☐ I was physically present at the location described above and personally observed the pipe or pipe segment when it was exposed and before it was removed, replaced and/or repaired.

☐ Presumed that pipe contained asbestos.

☐ Relied on representative samples that were analyzed at a certified laboratory.
Identify Laboratory and DLS certification number: _____

Date samples were collected: _____ Date of lab report: _____

Result of the analysis (% asbestos): _____

Does the pipe (or pipe segment) that will be disturbed contain asbestos? ☐ Yes ☐ No

If "Yes", what is the MassDEP Asbestos Notification Number (ANF-001 Form)? _____

3. Qualifications. Please check the applicable box:

☐ I have successfully completed the "8 hour OSHA Class II Asbestos Training: Asbestos Cement Pipe (ACP) Worker Safety" course approved by the Massachusetts Department of Labor Standards (DLS), or a course similar in length and content reviewed and approved in writing by DLS; or

☐ I am a DLS-certified Asbestos Inspector.

Name (please print): _____

Title/Company: _____

Signature: _____ Date: _____

Template B: Post-Abatement Visual Inspection Documentation

1. Project Location/Identification:

_____
(Street address, GPS coordinates or other location identification)

City/Town: _____ MA

MassDEP Asbestos Notification Number (ANF-001 Form): _____

2. Post-Abatement Visual Inspection Date of Visual Inspection: _____

When any repair/removal of an asbestos cement pipe or pipe segment is complete, a visual inspection must be done before the trench is backfilled to confirm that ALL of the following conditions have been met. Please check each condition below to document that the visual inspection confirmed:

☐ No visible debris was present in trench.

☐ No visible debris was present outside of the trench (e.g. in excavated soils and the immediately surrounding area).

☐ No visible contamination was seen on tools.

☐ All Asbestos Containing Waste Material has been removed from the area for proper disposal.

☐ I was physically present at the location described above and personally conducted this inspection while the pipe or pipe segment was exposed and before the trench was backfilled.

3. Qualifications. Please check the applicable box:

☐ I have successfully completed the ”8 hour OSHA Class II Asbestos Training: Asbestos Cement Pipe (ACP) Worker Safety” approved by the Massachusetts Department of Labor Standards (DLS), or a course similar in length and content reviewed and approved in writing by DLS; or

☐ I am a DLS-certified Asbestos Project Monitor.

Name (please print): _____

Signature: _____

Title/Company: _____

Date: _____

SECTION 31 00 00

EARTHWORK

PART 1 – GENERAL

1.01 SUMMARY

A. Section Includes

1. Excavating, filling, backfilling, stockpiling, bedding, compacting, grading, hauling, disposal of on-Site soils, processing of on-Site soils for reuse, testing of soils, engaging an independent Geotechnical Testing Agency to perform required quality assurance/quality control inspection and testing, protection and other Work necessary for construction of pipelines, structures, subsurface structures, foundations, pavements, earthen embankments and appurtenant Work in accordance with this Section and applicable reference standards listed in Article 1.03.

B. Related Requirements

1. Section 01 50 00 - Temporary Facilities and Controls

2. Section 31 10 00 – Site Clearing

3. Section 31 50 00 – Excavation Support and Protection

4. Section 32 90 00 – Planting

1.02 PRICE AND PAYMENT PROCEDURES

A. Measurement and payment requirements: per Division 01 General Requirements.

1.03 REFERENCES

A. Reference Standards

1. American Association of State Highway and Transportation Officials (AASHTO)

a. AASHTO M85 Standard Specification for Portland Cement

b. AASHTO M 295 Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete

c. AASHTO T11 Standard Specification for Materials Finer Than 75-Micrometer (No. 200) Sieve in Mineral Aggregates by Washing

d. AASHTO T27 Standard Method of Test for Sieve Analysis of Fine and Coarse Aggregates

e. AASHTO T96 Standard Method of Test for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine

2. ASTM International (ASTM)

a. ASTM C131 Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine

b. ASTM D422 Standard Test Method for Particle-Size Analysis of Soils

c. ASTM D698 Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12 400 ft-lbf/ft^3 (600 kN-m/m^3))

d. ASTM D1556 Density and Unit Weight of Soil in Place by the Sand-Cone Method

e. ASTM D1557 Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort

f. ASTM D2167 Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method

g. ASTM D2487 Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System)

h. ASTM D2922 Density of Soil and Soil Aggregate in Place by Nuclear Methods (Shallow Depth)

i. ASTM D2937 Standard Test Method for Density of Soil in Place by the Drive-Cylinder Method

j. ASTM D3017 Standard Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth)

k. ASTM D3740 Standard Practice for Minimum Requirements for Agencies Engaged in Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction

l. ASTM D6938 Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth)

m. ASTM E329 Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection

n. ASTM C131 / AASHTO T-96 (Los Angeles Abrasion Test)

3. MassDOT Standard Specifications and Supplements and Construction Details

B. Definitions

1. Unsuitable material: soft clay or silt, organic clays or silts, peats, debris, concrete, pavement, stones or boulders over 6 inches in diameter, wet or frozen material, and material deemed unsuitable by Owner or Engineer that will not provide suitable foundation or structural support for pipe and associated drainage structures, buildings, or other structures, and is unsuitable for use in backfill.

2. On-Site material: suitable material from on-Site excavation.

3. Normal grade: bottom of bedding specified for pipe and structures.

4. Pipe and structure bedding: material specified to provide uniform bearing for pipes and structures.

5. Pipe blanket: material specified to surround and protect pipe.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordination, sequencing, and scheduling: per Division 01 General Requirements.

1. Pre-installation conference: conduct at Project Site at least 30 days prior to start of Work.

a. Required attendees: Owner and Engineer, Owner's independent testing firm and geotechnical consultant, Contractor's Superintendent, Support of Excavation (SOE) Installer, Dewatering Installer and Contractor's independent testing firm

b. Review methods and procedures related to earthmoving including, but not limited to, the following.

1) Work hours

2) Personnel and equipment needed to maintain proposed construction schedule and avoid delays

3) Work procedures

4) Establishing and maintaining Site access

5) Coordination of Work with utility locator service

6) Stockpiling area and temporary access points

7) Site logistics for hauling and stockpiling

8) Coordination of Work and equipment movement with support of excavation systems installation

9) Construction phasing, anticipated daily and weekly progress and conformance to construction schedule

10) Methodology for field quality control

2. Make provisions for observations and testing of Work by Owner's independent testing and inspection agency and geotechnical consultant.

1.05 SUBMITTALS

A. Submit in accordance with Division 01 General Requirements.

B. Product Data

1. Provide for each on-Site and borrow soil material or aggregate

a. Name of each material Supplier, specific type and source of each material

b. Bills of Lading documenting materials source, including Supplier name and relationship to source, location where materials were obtained; including street, town, lot and block, country and state. Include present and past usage of source Site.

c. Supplier's statement that material is not contaminated and is free of extraneous debris or solid waste, and description of steps taken to confirm

d. Product weight shipping tickets certified by Supplier

C. Samples and Mockups: as specified in Article 1.06.

D. Certificates

1. Certification stating materials are virgin materials from a commercial or non-commercial source.

E. Design Data/Submittals

1. Materials gradation

F. Source and Field Quality Control Submittals

1. Field compaction testing

2. Material testing reports for each on-Site and borrow soil material proposed for fill and backfill in accordance with ASTM D2487

3. Laboratory compaction curve in accordance with ASTM D1557

4. Backfill moisture-density relationships

5. Submit daily field reports documenting earthwork activity and field-testing for each day. At minimum, reports shall include

   a. Description of day's activities

   b. Results of in-place density testing including in-place dry density, moisture content, percent compaction, elevation of test and description of soil

   c. Sketch indicating extent of each day's Work and location of testing

6. Daily records of over-excavated volumes including

   a. Beginning and end station of over-excavation

   b. Proposed elevation of subgrade

   c. Actual elevation of subgrade

   d. Calculated volume of additional excavation in bank cubic yards (BCY)

G. Qualification Statements

1. Contractor's independent testing agency, qualified for testing specified in ASTM E329 and ASTM D3740.

H. Closeout and Maintenance Material Submittals: per Division 01 General Requirements.

1.06 QUALITY ASSURANCE

A. Provide in accordance with Division 01 General Requirements.

B. Qualifications: per Division 01 General Requirements and as follows for geotechnical testing.

1. Geotechnical testing agency to monitor earthwork: qualified per ASTM 329 and ASTM D3740.

C. Independent Testing

1. Minimum of 50 pounds of material in an airtight container to testing laboratory.

D. Samples

1. Each type of soil or aggregate proposed for use on Project, a minimum of 14 days prior to Work.

2. Submit additional material Samples at least every 500 cubic yards throughout course of Work, if requested by Engineer to evaluate consistency of source or process.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Provide in accordance with Division 01 General Requirements.

B. Waste Management and Disposal

1. Legally dispose of excess or unsuitable material.

1.08 SITE CONDITIONS

A. Existing conditions: per Division 01 General Requirements.

B. Complete a site inspection prior to bidding the Work to assess existing site conditions, equipment access conditions, potential interferences with intended equipment, and location of existing structures and materials.

C. Obtain Owner's permission and complete additional subsurface explorations deemed necessary, at no expense to the Owner.

D. Notify Owner immediately upon discovery of potential conflicts between subsurface information provided in Division 01 General Requirements and existing conditions. Discontinue Work in conflict area but continue Work on other portions of the Project until further direction.

PART 2 – PRODUCTS

2.01 MATERIALS

A. General

1. Obtain approval of Owner and Engineer for changes in material sources.

2. On-Site Material: Maximize use of existing on-site materials approved by Owner to backfill trenches and excavations.

3. Identify off-Site sources of materials and testing of materials to verify compliance with Specifications. Material may be inspected by Owner.

4. All material used for backfilling shall be in a thawed state when placing and compacting, and shall be free from rocks, large or frozen lumps, wood or other unsuitable material. Backfill material shall not be placed on a frozen substrate.

B. Crushed stone: 3/4-inch sized, durable, clean angular rock fragments obtained by breaking and crushing rock material meeting MassDOT M2.01.4 criteria, free of ice, snow, sand, silt, clay, loam, shale, or other deleterious matter.

Sieve analysis by weight

Sieve Size	Percent Passing by Weight
1-inch	100
3/4-inch	90-100
1/2-inch	10- 50
3/8-inch	0- 20
#4	0-5

C. Sand: clean inert, hard, durable grains of quartz or other hard durable rock, free from loam or clay, surface coatings and deleterious materials.

Sieve analysis by weight

Sieve Size	Percent Passing by Weight
3/8-inch	100
#4	95-100
#16	50-85
#50	10-30
#100	2-10
#200	0-3

D. Suitable backfill: well-graded granular material. Retain at least 50 percent by weight on #4 sieve and contain less than 25 percent finer than a #200 sieve by weight, predominantly free from organic matter, man-made materials, ice, snow or other deleterious material.

E. Gravel borrow for trench backfill: hard, durable stone and course sand inert material, free from loam and clay, surface coatings and deleterious material, MassDOT Division III, subsection M1.03.0, Type b. Gradation requirements: AASHTO T11 and T27.

Sieve analysis by weight

Sieve Size	Percent Passing by Weight
1/2 inch	50-85
#4	40-75
#50	8-28
#200	0-10

Type b: maximum stone size = 3-inches in largest dimension

F. Gravel borrow for roadway subbase: processed gravel for backfill per MassDOT Section M1.03.1, consisting of hard, durable stone and course sand inert material, free from loam and clay, surface coatings and deleterious materials. Coarse aggregate percentage of wear: maximum 50 by ASTM C131 and AASHTO T 96.

Sieve analysis by weight

Sieve Size	Percent Passing by Weight
3 inch	100
1-1/2 inch	70-100
3/4 inch	50-85
#4	30-60
#200	0-10

G. Dense graded crushed stone: crusher-run coarse aggregates of crushed stone and fine aggregates of natural sand or stone screenings, uniformly pre-mixed with a predetermined quantity of water per MassDOT M2.01.7.

Sieve analysis by weight

Sieve Size	Percent Passing by Weight
2 inch	100
1-1/2 inch	70-100
3/4 inch	50-85
#4	30-55
#50	8-24
#200	3-10

H. Refill material: 3/4-inch crushed stone for below grade or rock excavation unless otherwise directed.

I. Common fill: friable material with no objects greater than 6 inches in diameter, no more than 30 percent by weight finer than No. 200 sieve, free from ice, snow, roots, sod, rubbish, other deleterious or organic matter, and observable contamination. Excavated material from on-Site sources meeting these Specifications may be used for common fill.

J. Select backfill: as specified for gravel borrow with stones maximum 3 inches in diameter.

K. Compacted structural fill: suitable bank run sand and gravel, free of clay, organic material, snow, ice, or other unsuitable materials, well-graded.

Sieve Designation	Percent Passing by Weight
3 inch	100
#4	30-90
#40	10-50
#200	0-8

L. Drainage stone: 1-1/2-inch crushed stone per MassDOT Section M2.01.1 of durable, clean angular rock fragments obtained by breaking and crushing rock material.

Sieve Size	Percent Passing by Weight
2 inch	100
1-1/2 inch	95 - 100
1 inch	35 - 70
3/4 inch	0 - 25

M. Controlled density fill (CDF): excavatable and used to limit settlement, lateral movement, undermining, washout and other hazards created by earthwork operations as shown on Drawings and when excavating around structures, utilities, sidewalks, pavements, and other facilities. Batch CDF at concrete plant.

1. Portland cement: AASHTO M85.

2. Fly ash: AASHTO M295. Class F

3. Sand: MassDOT M4.02.02.

4. Water: MassDOT M4.02.04.

5. Air entraining admixture: MassDOT M4.02.05.

6. Compressive strength: 28 day = 30-80 psi, 90 day = 100 psi.

7. Slump: 10 - 12 inches.

N. Riprap stone: sound, durable rock that will not disintegrate due to exposure to water or weather, angular in shape such as rough, unhewn quarry stone or fragments obtained by blasting, breaking or crushing natural rock. Do not use rounded boulders or cobbles; flat, platy stones; shale or slate rock with its largest length dimension 3 times greater than its shortest dimension.

O. Riprap gradation: stone size corresponding to inch dimension indicated on Drawings. D_{50} stone size represents 50 percent of stone passing D_{50} dimension sieve screen. D_{20} stone size, 20 percent passing: 1/2 D_{50} dimension. Maximum size limit: D_{100}: twice the D_{50} stone size dimension.

2.02 SOURCE QUALITY CONTROL

A. Provide in accordance with Division 01 General Requirements.

PART 3 – EXECUTION

3.01 EXAMINATION

A. Verification of Conditions

1. Check and verify governing dimensions and elevations before starting Work. Survey condition of adjoining properties with Engineer. Take digital video recording of any prior settlement or cracking of structures, pavements and other improvements. Provide list of damages, verified and signed by Contractor and Engineer.

2. Coordinate survey. Establish exact elevations at fixed points to act as benchmarks. Identify benchmarks and record existing elevations. Locate datum level used to establish benchmark elevations so it will not be affected by excavation operations.

3. Review geotechnical report and information for the Project. Review available logs of borings and test pits, records of explorations and other pertinent data for the Site. After obtaining Owner's permission, obtain additional subsurface explorations deemed necessary at no expense to the Owner.

4. Verify subsurface utilities have been marked prior to performing excavation or earthwork and provide sufficient notification to the local Dig Safe agency.

3.02 PROTECTION

A. Protect structures, utilities, sidewalks, pavements and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earth moving operations.

B. Protect and maintain erosion and sedimentation controls during earth moving operations.

C. Provide protective insulating materials to protect subgrades and foundation soils against freezing temperatures or frost. Remove temporary protection before continuing Work.

D. Prevent surface water and groundwater from entering excavations, ponding on prepared subgrades, and flooding Project Site and surrounding area.

E. Protect subgrades from softening, undermining, washout, and damage by rain or water accumulation.

1. Excavation will occur below water level. Complete Work in-the-dry to maintain undisturbed condition of bearing soil.

2. Reroute surface water runoff away from excavated area. Do not allow water to accumulate in excavations to ensure bottoms and sides of excavations remain firm and stable throughout construction operations. Do not use excavated trenches as temporary drainage ditches.

3. Install a dewatering system in accordance with Section 01 50 00 to keep subgrades dry and convey groundwater away from excavations. Maintain until dewatering is no longer required.

4. Recharge water from excavations on-Site avoiding injury to public health, public and private property, existing Work, Work to be completed or in progress, roads, walks and streets, or causing any interference with the public.

5. Do not place concrete or fill in excavations containing free water.

3.03 GENERAL EXCAVATION

A. Ensure sequence of excavation operations provides efficient use of excavated materials into embankments and minimum use of borrow.

B. Dispose of excavated materials including unsatisfactory soil materials, cobbles, boulders, and obstructions and replace with suitable backfill materials approved for reuse by Owner. Where on-site materials are insufficient to replace excavated materials, provide off-site materials in accordance with Article 2.01, as approved by Owner. Urban fill may be screened to remove unsatisfactory material and used requirements of suitable backfill in Article 2.01 are met.

C. Remove and legally dispose of pavements, curbing and other obstructions visible on ground surface, underground structures and utilities indicated to be demolished and removed, and other materials encountered that are not classified as rock excavation or unauthorized excavation. Legally dispose of surplus materials resulting from excavation not needed for use on Project as determined by Engineer. Obtain necessary permits for legal disposal of surplus material.

D. Unclassified excavation: excavating to subgrade elevations regardless of surface and subsurface conditions.

E. Classified excavation: excavating to subgrade elevations. Material excavated: classified as earth and rock. Do not excavate rock until it has been classified and cross sectioned by Engineer.

1. Earth excavation includes excavating pavements and obstructions visible on surface; underground structures, utilities, and other items indicated to be removed; together with soil, boulders, and other materials not classified as rock or unauthorized excavation.

2. Rock excavation includes removal and disposal of rock. Remove rock to lines and subgrade elevations indicated to permit installation of permanent construction without exceeding the following dimensions.

a. 24 inches outside of concrete forms other than at footings

b. 12 inches outside of concrete forms at footings

c. 6 inches outside of minimum required dimensions of concrete cast against grade

d. Outside dimensions of concrete walls indicated to be cast against rock without forms or exterior waterproofing treatments

1) 6 inches beneath bottom of concrete slabs-on-grade

2) 6 inches beneath pipe in trenches, and the greater of 24 inches wider than pipe or 42 inches wide

F. Remove materials encountered to limits shown on Drawings, as specified or required.

G. Do not perform excavation below normal grade to remove and replace unsuitable materials until approved by Engineer.

H. Unauthorized excavation: removal of materials beyond indicated subgrade elevations or dimensions without specific direction.

1. Refilling Unauthorized Excavation

a. Trenches: use 3/4-inch crushed stone or compacted structural fill and stabilization fabric as separator material as directed.

b. Backfill and compact unauthorized excavations as specified for authorized excavations, of same classification, unless otherwise directed.

c. Excavation below normal grade

1) Notify Engineer to observe conditions when excavation has reached required subgrade elevations. Carry excavations deeper and replace excavated material with compacted structural fill or crushed stone if unsuitable materials are encountered at required subgrade elevations as directed.

2. Excavation Above Normal Grade

a. Remove from Site and dispose of legally if unsuitable materials are encountered above normal grade. Do not use unsuitable materials as backfill on any portion of Project unless approved.

b. Use approved suitable stockpiled material to replace unsuitable material to backfill trenches to dimensions for pipe and structure bedding and backfill as shown on Drawings. Use gravel borrow to complete trench backfills to elevation shown for pipe and structure backfill if suitable stockpile material is not sufficient to backfill trenches to required dimensions.

I. Site Clearing

1. Clear site in accordance with Section 31 10 00.

J. Material Storage

1. Stockpile and maintain suitable surplus excavated materials for re-use as specified in Section 31 14 13.16.

3.04 EXCAVATION IN ASPHALT PAVEMENT AREAS

A. Saw cut or mill to full depth through existing pavement for pipe or structure placement prior to excavation. Minimize disturbance of remaining pavement.

B. Use shoring and bracing where sides of excavation will not stand without undermining pavement.

C. Remove and legally dispose of existing pavements during course of Work. Avoid mixing existing pavement material with excavation material intended for backfill.

3.05 EXCAVATION FOR TRENCHES

A. Excavate to widths shown on Drawings.

B. Produce an evenly graded flat trench bottom at subgrade elevation required for installation of pipe and bedding material.

C. Load excavated material directly into trucks unless otherwise approved.

D. Place backfill material directly into trench or excavation. Do not stockpile material to be used as backfill in traffic areas.

3.06 EXCAVATION FOR STRUCTURES

A. Excavate to indicated elevations and dimensions within tolerance of plus or minus 1 inch. Extend excavations sufficient distance from structures for placing and removing concrete formwork, for installing services and other construction, and inspections.

1. Excavate footings, foundations, and structures to final grade by hand just before concrete reinforcement placement. Do not disturb bottom of excavation. Trim bottoms to required lines and grades to leave solid base to receive other Work.

2. Do not excavate to final subgrade level until geotextile and compacted structural fill or crushed stone layer can be placed immediately to avoid softening or deterioration of formation. Leave a minimum depth of 3 feet overlying the final subgrade level in place where geotextile and compacted structural fill or crushed stone layer are not immediately placed.

3. Do not allow trafficking on final subgrade or upper surface of crushed stone layer without prior placement of approved sacrificial haulage layer.

B. Approval of Subgrade

1. Notify Engineer when excavations have reached required subgrade. Remove last 6 inches just prior to inspection.

2. Clear subgrade of soft, spongy or other material unsuitable for founding. Continue excavation and replace with compacted structural fill as directed if independent inspection and testing agency or geotechnical consultant determines presence of unsatisfactory soil.

3. Finished subgrade tolerance: plus or minus 1 inch.

4. Seal subgrade and protect from degradation.

5. Re-compact exposed surfaces prior to placing compacted structural fill or constructing foundations in accordance with Article 3.11, with a minimum 4 passes with double-drum vibratory roller compactor following excavation to foundation bearing levels in natural soils, using Bomag BW 60S or equivalent. Engineer may waive re-compaction if integrity of subgrade soils is compromised. Do not proof-roll wet or saturated subgrades.

6. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water or construction activities affecting final subgrade.

7. Seal formations within 4 hours of inspection with specified geotextile and compacted structural or crushed stone fill.

8. Protect formations from loosening by traffic or resulting from high groundwater table.

C. Provide monitoring of geotechnical instrumentation against predefined target performance values.

3.07 PROCESSING OF ON-SITE URBAN FILL USED FOR BACKFILL

A. Excavate urban fill where encountered in Work to designated depths and stockpile until processed.

B. Pass on-Site cohesionless soils excavated from trench through mechanical screen to remove particles larger than 3 inches.

C. Reuse only processed urban fill containing maximum of 5 percent by dry weight of roots, plants, sod, clay lumps or other organic or cohesive soils.

3.08 ROCK EXCAVATION

A. Notify Engineer immediately of change in classification. Expose bedrock surface to allow Engineer to perform an elevation survey and take cross-sectional measurements if bedrock is encountered above trench bottom grade or above subgrade elevation.

B. Perform rock excavation by mechanical methods only. Do not blast.

C. Remove or partially remove boulders exposed on sides or bottom of excavations to limits shown on the Drawings or as directed by the Owner. Remove boulders to

1. minimum 2 feet outside structure walls;

2. minimum 12 inches outside footings;

3. minimum 6 inches below under-slab subgrade;

4. minimum lateral trench width line limits indicated; and

5. minimum 12 inches below underside of pipes.

D. Refill depressions resulting from removal of boulders and rock with approved compacted bedding.

E. Refill unauthorized rock excavations, or excavations made beyond or below indicated or directed excavation limits, with compacted bedding.

F. Remove and legally dispose of unused rock and boulders off-Site.

G. Remove and legally dispose of residual solids to limits shown on Drawings, as specified, or needed to complete Project in accordance with Laws and Regulations.

3.09 SHORING AND BRACING

A. Provide in accordance with Section 31 50 00.

3.10 BACKFILL AND FILL

A. General

1. Suspend operations when weather conditions are unsatisfactory for placing backfill and avoid disturbing placed material and approved excavations.

2. Remove and replace excavation or material previously placed that have softened or eroded, soft and yielding material, or other unsuitable or damaged areas with compacted backfill as specified.

3. Do not backfill excavations and trenches until new utilities and structures have been inspected and tested satisfactorily for conformance with Drawings and Specifications unless directed. Place soil material in layers to required elevations as shown on Drawings or specified. Fill, backfill, and compact in accordance with this Section to produce minimum subsequent settlement of material. Provide support for surface treatment or structure to be placed on material. Place material in approximately horizontal layers beginning at lowest area, maintaining drainage. Replace frozen or saturated fill in stockpiles with suitable off-Site fill.

B. Provide compacted structural fill or backfill for structure, placed beneath the structures' foundations and slabs-on-grade where unsuitable soil has been over excavated below design subgrades, and against below grade walls.

C. Do not reuse excess excavated on-Site soils as compacted structural fill below foundations.

D. Ground Surface Preparation

1. Remove asphalt and concrete pavements, granular base course, existing sandy and gravelly fills, existing organic silty clay soils, organic peat, vegetation, debris, unsatisfactory soil materials, obstructions, and deleterious materials from ground surface to excavation subgrade prior to placement of fills.

2. When existing ground surface has a density less than specified for a particular area classification, break up ground surface, pulverize, moisture-condition to optimum moisture content, and compact to required depth and percentage of maximum density.

E. Placement

1. Place backfill and fill materials in layers of maximum 6 inches in loose depth for material compacted by heavy compaction equipment or hand-operated tampers. Do not place backfill or fill material on surfaces that are muddy, frozen, or contain frost or ice.

2. Place backfill and fill materials evenly, adjacent to structures, to required elevations. Prevent wedging action of backfill against structures by carrying material uniformly around structure to approximately same elevation in each lift.

3. Do not allow heavy machinery within 5 feet of structure during backfilling and compacting.

F. Backfilling Excavations

1. Backfill excavations promptly as Work permits and after completion of the following.

   a. Inspection and recording locations of underground utilities and structures

   b. Removal of concrete formwork

   c. Removal of shoring and bracing, and backfilling of voids with satisfactory materials

   d. Removal of trash and debris

2. Backfill under existing utility pipes crossed by new utility pipes with CDF. Extend CDF continuously from bedding of new pipe to utility pipe crossed, including a 6-inch thick envelope around existing utility pipes.

3. Backfill with CDF when clearance between proposed structure and existing structure is 18 inches or less and sufficient clearance is not provided to obtain suitable compaction.

4. Backfill with CDF for trenches within impervious surfaces with pipes containing less than 3 feet of cover.

5. Provide that 3/4 inch crushed stone backfill stands at its own angle of repose. Do not haunch or form with common fill.

G. Backfilling Trenches

1. Place pipe and structure bedding, and gravel bedding to extent and dimensions shown on Drawings so pipes and structures have complete and uniform bearing.

2. Grade, compact, and shape pipe and structure bedding so full length of pipe barrel has complete and uniform bearing. Dig bell holes and depressions for joints after bedding has been graded and compacted, at proper clearance for jointing pipes.

3. Carefully hand place and compact additional approved bedding to limits shown on Drawings following inspection and approval of pipe installation by Engineer. Perform hand or mechanical tamping on sides of pipe.

4. Place 6 inches of suitable backfill (having stones maximum 3 inches in diameter) in trenches above pipe crown; 6 inches above crown of highest pipe around structures and up to underside of pavement. Spread in layers of maximum 6 inches in loose thickness and compact in accordance with Article 3.11, and compact each layer by minimum 4 passes using pproved vibratory compactor. Avoid disturbance of Work and existing structures. Adjust moisture content of backfill for proper compaction.

5. Bed pipe in 3/4-inch crushed stone pipe and structure bedding as shown on Drawings. Remaining trench backfill: as shown on Drawings.

6. Restore surface of trenches in cross-country runs to pre-existing conditions as shown on Drawings, mounding trench 6 inches above existing grade or as directed.

H. Earthen Embankment Fill

1. Strip organic topsoil, trees, shrubs and roots of other vegetation along length and breadth of areas having fill material placed on top. Fill depressions left by grubbing and stripping with same type material and compact to a density at least equal to surrounding foundation material.

2. Replace unsuitable soil with compacted fill material identified by independent inspection and testing agency or Engineer.

3. Proof roll subgrades as directed prior to placement of fill. Excavate soft areas and replace with appropriate compacted fill.

4. Do not place embankment over porous, wet, frozen, or spongy subgrade or previous embankment surfaces. Excavate and remove unsuitable material prior to placing additional fill.

5. Dewater to maintain groundwater levels a minimum of 1 foot below bottom of excavations or subgrades. Place fill in-the-dry.

6. Bench existing slopes prior to placing horizontal fill layers on existing slopes greater than 6H:1V.

7. Place materials in continuous horizontal layers in loose lift thickness of maximum 8 inches.

8. Compact soil materials in accordance with ASTM D1557, with water content of plus or minus 2 percent moisture content. Remove and replace with drier fill if wet fill cannot be compacted as specified.

9. Uniformly water fill that is too dry for proper compaction with sufficient water to allow compaction to required density.

10. Compact impervious and semi pervious materials with more than 15 percent passing the #200 sieve, with a tamping sheep-foot roller or rubber-tired roller. Scarify surface before placement of next lift if compaction results in smooth surface on top of lift.

11. Remove and replace fill that is disturbed after compaction and re-compact to specified degree of compaction.

12. Place and compact soil material on embankment in a direction parallel to embankment top.

3.11 COMPACTION

A. Use approved methods that produce required degree of compaction throughout entire depth of material placed without damage to new or existing facilities. Adjust moisture content of soil as required. Remove and replace material that is too wet to compact to required density. Compact each layer as Work progresses.

B. Place compacted structural fill for support of footings and foundations and against below grade walls in loose lift thicknesses not exceeding 10 inches. Compact to minimum 95 percent maximum dry density in accordance with ASTM D1557.

C. Place backfill in open areas with self-propelled vibratory rollers, and hand-guided equipment in confined areas. Loose lift thickness: maximum 6 inches.

D. Perform a minimum 4 systematic passes to compact each lift with specified compaction equipment.

E. Place backfill and fill soil materials evenly on sides of structures to required elevations, and uniformly along full length of each structure.

Compaction Method	Maximum Stone Size	Maximum Loose Lift Thickness		Minimum Number of Passes	
		Below Pavement	Less Critical Areas	Below Pavement	Less Critical Areas
Hand-operated vibratory plate or light roller in confined areas	4 inches	6 inches	8	4	4
Hand-operated vibratory drum rollers weighing at least 1,000 pounds in confined areas	6 inches	10 inches	12 inches	4	4
Light vibratory drum roller minimum weight at drum 5,000 pounds, minimum compaction force 10,000 pounds	8 inches	6 inches	18 inches	4	4
Medium vibratory drum roller min. weight at drum 10,000 pounds, minimum compaction force 20,000 pounds	8 inches	6 inches	24 inches	6	6

F. Degree of Compaction

Fill and Backfill Location	Minimum Density
Top 3 feet under pavement grade	95 percent of maximum
Below slabs and foundations	95 percent of maximum
Below top 3 feet under pavement grade	92 percent of maximum
Pipe Bedding	92 percent of maximum
Beside structure foundation walls	95 percent of maximum
Maximum density	ASTM D698, modified
Field density tests	ASTM D1556 (sand cone) or ASTM D6938 (nuclear methods)

G. Disc harrow or dry fill material that is too wet for compaction to specified moisture content and to required density. Remove and replace with drier fill that cannot be dried within 48 hours of placement.

3.12 GRADING

A. Uniformly grade areas, including adjacent transition areas. Smooth finished surface within specified tolerances. Compact with uniform levels or slopes between points where elevations are shown, or between points where elevations are shown and existing grades.

B. Grade areas adjacent to structure lines to drain away from structures and prevent ponding.

C. Finish surfaces: free from irregular surface changes and as follows.

1. Finish lawn or other unpaved areas to receive topsoil to within a maximum 0.10 feet above or below required subgrade elevations.

2. Shape surface of areas under pavement to line, grade and cross-section, with finish surface not more than plus or minus 1 inch above or below required subgrade elevation.

3.13 RIPRAP

A. Place riprap to full depth of $1.5D_{50}$ in one operation without special handwork, measured perpendicular to face of slope to obtain uniform appearance true to line and grade. Place larger stones at bottom of slope. Place stones in close contact with interlocking of face stones and backing stones. Fill openings between stones with smaller stones. Embed, re-orient or discard loose stones or excessively large stones projecting above surface.

3.14 EROSION CONTROL

A. Provide erosion control measures in accordance with Division 01 General Requirements.

3.15 PROTECTION

A. Protect newly graded areas from traffic and erosion. Keep free of trash and debris. Repair and re-establish grades in settled, eroded, and rutted areas to specified tolerances.

B. Scarify surface, re-shape, and compact to required density prior to further construction where completed compacted areas are disturbed by subsequent construction operations or adverse weather. Immediately repair any subsequent settling and provide maintenance for remainder of Work.

C. Remove soft or unsuitable material and replace with suitable backfill material prior to paving on sub-grade. Bring low sections, holes, or depressions to required grade with approved material. Shape sub-grade to line, grade, and cross section, and thoroughly compact.

D. Keep roads free of debris. Use watertight vehicles for hauling wet materials over roads and streets. Promptly clean materials dropped or spread by vehicles or when directed by Engineer.

3.16 FIELD QUALITY CONTROL

A. Provide in accordance with Division 01 General Requirements.

B. Owner may engage a qualified special inspector to perform the following special inspections in addition to the Contractor's independent testing.

1. Confirm specified fill and backfill are used.

2. Confirm preparation of Site.

3. Observe removal of existing unsuitable foundation materials from footing and slab areas and confirm character of material encountered at bearing levels.

4. Confirm compliance of fill material and maximum lift thickness.

5. Confirm compliance of in-place density of compacted fill with required frequency.

6. Observe preparation of footing bearing surfaces.

7. Confirm suitability of excavated soils for reuse as fill, including reuse of on-Site soils as common fill.

C. Perform at least 1 test of each soil stratum at foundation subgrades to verify design bearing capacities. Subsequent verification and approval of other footing subgrades may be based on visual comparison of subgrade with tested subgrade when approved.

D. Engage an independent testing agency to test compaction of soils in place in accordance with ASTM D1556, ASTM D2167, ASTM D2922, and ASTM D2937.

1. Tests

a. Paved and structure areas: at subgrade and each compacted fill and backfill layer, at least 1 test for every 2,000 square feet or less of paved area or concrete slab, with minimum 3 tests.

b. Foundation walls backfill: at each compacted backfill layer, at least 1 test for every 100 feet or less of wall length, with minimum 2 tests.

c. Trench backfill: at each compacted initial and final backfill layer, at least 1 test for every 150 feet less of trench length, with minimum 2 tests.

2. Scarify and moisten or aerate, or remove and replace soil materials to depth required when testing agency reports subgrades, fills, or backfills have not achieved degree of compaction specified. Re-compact and re-test until specified compaction is obtained.

3. Determine actual in-place densities using field tests as directed.

4. Perform additional Work to obtain proper compaction if in-place densities do not meet specified densities. Retest if directed by Engineer.

5. Tests for Pipe Backfill

a. Suitable backfill: compact backfill in maximum loose lifts per table above. Conduct 1 field density test every 50 linear feet for each lift for utility lines.

b. Pavement sub-base: minimum 1 field density test of sub base for every 50 linear feet of paved area.

3.17 CLOSEOUT ACTIVITIES

A. Provide in accordance with Division 01 General Requirements.

END OF SECTION

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SECTION 31 10 00

SITE CLEARING

PART 1 – GENERAL

1.01 SUMMARY

A. Section Includes

1. Provide Site clearing and grubbing in accordance with this Section.

B. Related Requirements

1. Section 01 05 00 – Temporary Facilities and Controls

2. Section 32 90 00 – Planting

1.02 PRICE AND PAYMENT PROCEDURES

A. Measurement and payment requirements: per Division 01 General Requirements.

1.03 REFERENCES

A. Definitions

1. Clearing: cutting and disposing of trees, downed timber, stubs, brush, bushes, snags, rubbish, debris, and other objectionable matter and materials, removal, storage and installation of fences, signs, walks, guard rails, curbs and other items to be restored.

2. Grubbing: removal and disposal of stumps, roots, duff, foundations and other objectionable matter, and materials to a minimum of 6 inches below original ground surface.

3. Topsoil: friable loam surface soil found in a depth of not less than 4 inches from original ground surface. Satisfactory topsoil: reasonably free of subsoil, clay lumps, stones, and objects over 2 inches in diameter, and free of weeds, roots, and other objectionable material.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordination, Sequencing, and Scheduling: per Division 01 General Requirements.

1.05 SUBMITTALS

A. Submit in accordance with Division 01 General Requirements.

B. Closeout and Maintenance Material Submittals: per Division 01 General Requirements.

1.06 QUALITY ASSURANCE

A. Provide in accordance with Division 01 General Requirements.

1.07 DELIVERY, STORAGE AND HANDLING

A. Provide in accordance with Division 01 General Requirements.

B. Store trees, plants and shrubs in protected areas and provide water to keep them in thriving condition for replanting.

C. Store slate and flagstone walk sections, granite and stone curbs, fences, signs, guard rails and other items removed for reinstallation at approved locations. Protect from damage until reinstallation.

D. Do not obstruct roads, driveways, sidewalks, gutters and drainage ditches, swales and channels with stored materials.

1.08 SITE CONDITIONS

A. Existing Conditions: per Division 01 General Requirements.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.01 EXAMINATION

A. Verification of Conditions

1. Verify Site conditions. Review site conditions at each location with Owner prior to beginning work. Identify trees, plantings, vegetation, sidewalks, curbs and other living and nonliving items required to remain. Protect items identified from damage. Replace damaged items with new materials of equal or better quality, as required by Owner at no additional cost.

2. Verify limiting boundaries, such as permanent and temporary easements, property lines, rights-of-way and grading limits, have been located and marked.

3. Verify pipeline routings and other items of Work have been located and marked.

3.02 PREPARATION

A. Mark trees, plantings and other items to be removed, trimmed, cut, or removed and preserved. Inspect items with Engineer prior to start of Work. Do not remove or trim unmarked items unless approved by Engineer.

B. Protect existing trees and vegetation indicated to remain in place against cutting, breaking or skinning of roots, skinning and bruising of bark, smothering by stockpiling construction or excavated materials within drip line, excess foot or vehicular traffic, or vehicle parking within drip line. Provide temporary guards to protect trees and vegetation to be left standing.

C. Protect existing objects. Avoid interference with use of, and passage to and from adjacent buildings, facilities, driveways, walks, drainage systems and road.

D. Remove highway signs, guard rails and other control, safety, and warning devices just prior to installation of Work.

E. Notify affected property owners at least 4 days in advance of fence removal. Do not remove fencing more than 48 hours in advance unless written permission is received from property owner.

F. Leave items affecting traffic, safety, containment of humans and animals, and essential to protection of property or operation of a business, in place until Work is ready to be installed. Restore items immediately after installation.

3.03 IMPLEMENTATION

A. General

1. Use of explosives for clearing and grubbing operations is not allowed.

2. Limit clearing and grubbing to preserve plantings and natural vegetation. Perform Work so present growth will blend with limits of construction and attain natural appearance.

3. Confine clearing and grubbing operations within grading limits as shown on Drawings, and within Owner easements and property lines.

4. Provide measures to avoid erosion.

5. Do not disturb property markers unless absolutely necessary. If necessary to disturb or remove a property marker, employ a professional land surveyor licensed in the state where the Project is located to establish property marker location; mark area, and replace property marker immediately, in compliance with Division 01 General Requirements.

B. Stripping Topsoil

1. Strip topsoil within limits indicated on Drawings, or as required to prevent mixing with underlying subsoil or objectionable material.

2. Prevent damage to main root system of trees indicated to be left standing.

3. Stockpile topsoil in areas shown on Drawings, or where directed, and provide for drainage of surface water. Protect stockpiles to prevent windblown dust and erosion.

4. Stockpile surplus material on-Site. Surplus loam and topsoil not required for completion of Work will remain on Owner's property. Maintain and protect until Work is complete.

C. Trees and Plantings

1. Remove only items marked for removal in grassed, planted and open areas.

2. Trees

a. Notify property owners 1 month in advance of tree trimming or removal to allow property owner to cut and remove trees and retain debris, unless otherwise directed.

b. Remove or trim trees in wooded areas only as required. Minimize damage to trees left standing. Immediately remove and legally dispose of debris.

c. Take possession of timber and wood directed to be removed from the Site by Owner. Deliver timber and wood directed to remain to location designated by Owner at no additional cost to Owner.

d. Trim trees evenly to achieve neat appearance with least possible damage to trees.

e. Apply wet burlap to prevent drying where roots are cut or damaged.

D. Pavements, Walks, Curbs and Guard Rails

1. Remove existing pavements, walks, and curbs to limits shown on Drawings, or if not shown, to minimum extent possible to complete the work.

2. Saw-cut pavements to be removed, including highways, driveways and walks. Remove when Work is ready to be installed.

3. Remove slate and flag stone walks, granite and stone curbs, and guard rails to minimum extent possible. Terminate removals at joint or guard rail post. Store and protect for reuse.

E. Walls, Fences, and Other Obstructions

1. Remove walls, fences, signs, sheds and other obstructions and store for replacement after verification with Owner and Engineer.

2. Protect existing structures during Work.

F. Remove and legally dispose of materials not specified to be stored or reused. Do not burn debris unless approved and required permits obtained.

G. Comply with Section 32 90 00 for replanting and restoring surfaces.

H. Replace and restore items and materials removed to original conditions.

I. Replace items damaged during removal, storage or re-installation with new items equal in quality and appearance, as approved by Owner at no additional cost.

3.04 FIELD QUALITY CONTROL

A. Provide in accordance with Division 01 General Requirements.

3.05 CLOSEOUT ACTIVITIES

A. Provide in accordance with Division 01 General Requirements.

END OF SECTION

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SECTION 31 50 00

EXCAVATION SUPPORT AND PROTECTION

PART 1 – GENERAL

1.01 SUMMARY

A. Section Includes

1. Provide excavation support and protection in accordance with this Section and applicable reference standards listed in Article 1.03, including shoring and bracing necessary to protect existing buildings, sidewalks and streets, utilities, all existing improvements, and excavation against movement due to caving, to meet OSHA safety requirements of shoring and bracing, and to cofferdams.

   a. Installation of shoring and bracing

   b. Maintenance of shoring and bracing

   c. Removal of shoring and bracing, as required

2. Shoring and bracing systems include permanent and temporary measures.

B. Related Requirements

1. Section 31 00 00 - Earthwork

1.02 PRICE AND PAYMENT PROCEDURES

A. Measurement and payment requirements: per Division 01 General Requirements.

1.03 REFERENCES

A. Reference Standards

1. American Institute of Steel Construction (AISC)

   a. Steel Construction Manual

2. ASTM International (ASTM)

   a. ASTM A36 Standard Specification for Carbon Structural Steel

   b. ASTM A307 Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60000 PSI Tensile Strength

   c. ASTM A328 Standard Specification for Steel Sheet Piling

d. ASTM A572 Standard Specification for High-Strength Low-Alloy Columbium-Vanadium Structural Steel

e. ASTM A615 Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement

f. ASTM A690 Standard Specification for High-Strength Low-Alloy Nickel, Copper, Phosphorus Steel H-Piles and Sheet Piling with Atmospheric Corrosion Resistance for Use in Marine Environments

g. ASTM A992 Standard Specification for Structural Steel Shapes

3. American Welding Society (AWS)

a. D1.1 - Structural Welding Code, Steel

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordination, sequencing, and scheduling: per Division 01 General Requirements.

B. Pre-installation Conference

1. Review geotechnical report, existing utilities and subsurface conditions.

2. Review coordination for interruption, shutoff, capping, and continuation of utility services.

3. Review instrumentation and monitoring program, and dewatering program. Confirm coordination with instrumentation and monitoring, and dewatering activities.

4. Review proposed excavations and equipment, monitoring of excavation support and protection system and abandonment or removal of excavation support and protection system.

1.05 SUBMITTALS

A. Submit in accordance with Division 01 General Requirements.

1. Do not begin excavation requiring support until submittals are approved.

B. Product Data

1. Construction details, material descriptions, performance properties, dimensions of individual components and profiles, and calculations for excavation support and protection system for each type of product.

C. Shop Drawings

1. Plans, elevations, sections, and details for excavation support and protection system, by professional engineer licensed in the state where Project is located.

2. Arrangement, locations, and details of soldier piles, sheet piling, lagging, tiebacks, bracing, and other components of excavation support and protection system by professional engineer licensed in the state where Project is located.

3. Written plan for excavation support and protection, including sequence of construction of support and protection coordinated with progress of excavation.

D. Calculations and analysis data for excavation support and protection system by professional engineer licensed in the state where Project is located.

E. Closeout and maintenance material submittals: per Division 01 General Requirements.

1. Identify locations and depths of capped utilities, abandoned-in-place support and protection systems, and other subsurface structural, electrical, or mechanical conditions on record documents.

1.06 QUALITY ASSURANCE

A. Provide in accordance with Division 01 General Requirements.

B. Qualifications: per Division 01 General Requirements for Installer and professional engineer.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Provide in accordance with Division 01 General Requirements.

1.08 SITE CONDITIONS

A. Existing conditions: per Division 01 General Requirements.

B. Review geotechnical report and determine need to perform additional test borings and conduct other exploratory operations necessary for excavation support and protection.

C. Verify dimensions and elevations before starting Work. Survey condition of adjoining properties with Engineer. Take photographs, recording any prior settlement or cracking of structures, pavements, and other improvements. Prepare list of existing damages, verified by dated photographs, signed by Contractor, Engineer and others conducting the investigation.

D. Survey adjacent structures and improvements, establishing exact elevations at fixed points to act as benchmarks. Identify benchmarks and record existing elevations. Locate datum level where it will not be affected by excavation operations.

E. Interruption of Existing Utilities

1. Do not interrupt any utility serving facilities without Owner's written permission. Provide temporary utility if required.

2. Provide minimum 5 days' advance notice of proposed interruption of utility.

PART 2 – PRODUCTS

2.01 MATERIALS

A. Provide shoring and bracing materials, in serviceable condition and adequate for intended purpose.

B. Steel sheet piling and shapes: continuous interlocking type; section modulus, type of section specified, in accordance with ASTM A328, ASTM A572, and ASTM A690, with continuous interlocks.

C. Provide movable box where shoring system is required, and where sheet piling is not specified.

D. Bracing members: wood timbers or steel members in accordance with ASTM A36.

E. Provide bolts in accordance with ASTM A307.

F. Provide structural steel in accordance with ASTM A36, ASTM A690, and ASTM A992.

G. Wood lagging: lumber, mixed hardwood, pressure-treated.

H. Provide reinforcing bars in accordance with ASTM A 615, Grade 60, deformed.

2.02 DESIGN CRITERIA

A. Provide services by professional engineer licensed in the state where Project is located, including preparation of Shop Drawings.

B. Design excavation support system in accordance with earth pressures and other criteria indicated, for construction of permanent structures without excessive movement or settlement of adjacent buildings, roadways, structures, or utilities, as shown on Drawings and as specified. Include analysis by professional engineer licensed in the state where Project is located.

C. Earth support design: coordinated dewatering design incorporating lowest anticipated excavation depths and full differential water head during dewatering.

D. Consult official records of both surface and subsurface existing utilities and connections to verity existing conditions and limitations as they apply to this Work and its relation to other construction work. Proceed with caution in areas of utility facilities. Excavate by hand, or other methods acceptable to utility owner. Protect existing utilities to remain within and adjacent to Work area in accordance with requirements of authorities having jurisdiction.

2.03 SOURCE QUALITY CONTROL

A. Provide in accordance with Division 01 General Requirements.

PART 3 – EXECUTION

3.01 GENERAL

A. Anchor and brace system to resist earth and hydrostatic pressures, including surcharges from surface loads. Support excavation to prevent undermining or disturbance to foundations of existing structures and utilities, or of ongoing or previously completed Work. Shore, support, and protect utilities encountered.

B. Install excavation support and protection systems to ensure minimum interference with roads, streets, walks, and adjacent occupied and used facilities.

1. Do not close or obstruct streets, walks, or adjacent occupied or used facilities without approval. Provide alternate routes around closed or obstructed traffic ways if required.

C. Maintain shoring and bracing while excavation is open.

D. Check base stability.

E. Prevent surface water from entering excavations.

3.02 STEEL SHEET PILING

A. Install 1-piece sheet piling lengths and interlock vertical edges to form a continuous barrier before starting excavation.

B. Place piling using templates and guide frame unless otherwise specified by sheet piling manufacturer. Limit vertical offset of adjacent sheet piling to 60 inches. Align exposed faces of sheet piling to vary not more than 2 inches from a horizontal line, and not more than 1:120 out of vertical alignment.

C. Cut off sheet piling to be left in place at least 5 feet below finish grade. Indicate location of sheet piling cut off and left in place on record documents.

D. Remove steel sheet piling following completion of Work where shown on Drawings or directed by Engineer. Obtain approval for steel sheet piling to be left in place.

3.03 BRACING

A. Locate bracing to clear columns, floor framing construction, and other permanent Work. Install new bracing before removing original brace if moved. Do not place bracing where it will be cast into permanent concrete Work unless approved by Engineer.

B. Install internal bracing if required to prevent spreading or distortion of braced frames.

C. Maintain bracing until structural elements are supported by other bracing, or until permanent construction is able to withstand lateral earth and hydrostatic pressures.

3.04 REPAIR/RESTORATION

A. Remove excavation support and protection systems in stages to avoid disturbing underlying soils and rock, or damaging structures, pavements, facilities, and utilities.

B. Fill voids immediately with approved backfill compacted to density specified in accordance with Section 31 00 00.

C. Repair or replace adjacent Work damaged or displaced by removing excavation support and protection systems.

3.05 FIELD QUALITY CONTROL

A. Provide in accordance with Division 01 General Requirements.

B. Promptly correct detected bulges, breakage, or other evidence of movement to ensure that excavation support and protection system remains stable.

C. Promptly repair damages to adjacent facilities caused by installation or faulty performance of excavation support and protection systems.

3.06 CLOSEOUT ACTIVITIES

A. Provide in accordance with Division 01 General Requirements.

END OF SECTION

SECTION 32 12 16

ASPHALT PAVING

PART 1 – GENERAL

1.01 SUMMARY

A. Section Includes

1. Furnish and install tack prime coat, hot mix asphalt pavement base and surface courses, temporary trench paving, permanent trench paving, pavement reclamation, structure protection and adjustments, sidewalks, driveways, hot mix asphalt berm and curb, and miscellaneous patching in accordance with this Section and applicable reference standards listed in Article 1.03.

1.02 PRICE AND PAYMENT PROCEDURES

A. Measurement and payment requirements: per Division 01 General Requirements.

1.03 REFERENCES

A. Reference Standards

1. American Association of State Highway and Transportation Officials (AASHTO)

a. AASHTO M320 Standard Specifications for Performance-Graded Asphalt Binder

b. AASHTO T166 Standard Method of Test for Bulk Specific Gravity (Gmb) of Compacted Hot Mix Asphalt (HMA) Using Saturated Surface-Dry Specimens

c. AASHTO T209 Standard Method of Test for Theoretical Maximum Specific Gravity (Gmm) and Density of Hot Mix Asphalt (HMA)

d. AASHTO TP 68 Standard Method of Test for Density of In-Place Hot-Mix Asphalt (HMA) Pavement by Electronic Surface Contact Devices

2. MassDOT

a. Standard Specifications and Supplements, and Construction Standard Details

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordination, sequencing, and scheduling: per Division 01 General Requirements.

1.05 SUBMITTALS

A. Submit in accordance with Division 01 General Requirements.

B. Certificates: manufacturer's certificate verifying conformance.

C. Mix design: for each grade of pavement used, at least 20 days prior to start of paving.

D. Source and field quality control submittals

1. Certified weigh slips for each truck load of bituminous material.

E. Closeout and maintenance material submittals: per Division 01 General Requirements.

1.06 QUALITY ASSURANCE

A. Provide in accordance with Division 01 General Requirements.

B. Comply with road opening permits.

C. Establish and control pavement (aggregate or asphalt base course and asphalt surface course) alignments, grades, elevations, and cross sections to match existing and prevent ponding.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Provide in accordance with Division 01 General Requirements.

1.08 SITE CONDITIONS

A. Existing conditions: per Division 01 General Requirements.

PART 2 – PRODUCTS

2.01 BITUMEN FOR TACK PRIME COAT

A. Provide in accordance with MassDOT Section 460, M3.11.06.

2.02 HOT POURED RUBBERIZED ASPHALT SEALANT

A. Provide in accordance with MassDOT Section 460.

2.03 HOT MIX ASPHALT SURFACE COURSE STANDARD TOP

A. Provide in accordance with MassDOT Section 460, M3.11.03.

2.04 HOT MIX ASPHALT BASE COURSE

A. Provide in accordance with MassDOT Section 420, M3.11.03.

2.05 HOT MIX ASPHALT BERM

A. Provide in accordance with MassDOT Section 470, M3.11.03.

2.06 HOT MIX ASPHALT FOR MISCELLANEOUS WORK

A. Provide in accordance with MassDOT Section 472.

2.07 SOURCE QUALITY CONTROL

A. Provide in accordance with Division 01 General Requirements.

PART 3 – EXECUTION

3.01 GENERAL

A. Minimize area of pavement removed to suitable width for installation of Work. Legally dispose of existing pavements.

B. Place hot mix asphalt between April 1 and November 15, unless otherwise specified by Owner.

C. Do not place hot mix asphalt mixture unless breakdown and intermediate rolling can be completed by time material has cooled to 175 degrees F, and provided density of completed pavement attains at least 92.5 percent of maximum theoretical density as determined by AASHTO T209.

D. Do not place mix on wet or damp surfaces, or when ambient temperature is 40 degrees F and falling, unless otherwise specified by Owner.

E. When air temperature falls below 50 degrees F, take extra precaution drying aggregates, controlling temperatures of materials, placing, and compacting mixtures.

F. Use straightedge to check compacted surfaces and obtain Engineer's approval.

G. Utilize approved dial type thermometer and infrared pistol thermometer for each paving machine. Retain thermometer upon completion of Project.

1. Fahrenheit or Celsius selectable

2. Portable and battery operated

3. Repeatability: plus or minus 5 degrees F.

4. LCD display: to nearest 1 degree.

5. Accuracy: plus or minus 2 percent.

6. Emissivity: present at 0.95.

7. Temperature operation range: 0 degrees F to 750 degrees F.

3.02 INSTALLATION

A. Place hot mix asphalt base and top courses on roadways, sidewalks and other areas to maintain traffic access and egress to properties abutting Work, and for safe passage of pedestrian and vehicular traffic in accordance with MassDOT Section 460 and Construction Standard Details.

1. Provide minimum compacted thickness depth of hot mix asphalt base course indicated on Drawings or as directed by Engineer to achieve necessary base course grade in support of finish grade pavement elevations.

2. Apply bitumen for prime and tack coat at a rate of 0.07 gallons per square yard over milled areas immediately prior to installation of top course, as shown on Drawings or directed by Engineer. Clean surface of sand and foreign matter, and dry before applying prime coat.

3. Apply bitumen for prime and tack coat at a rate of 0.05 gallons per square yard over hot mix asphalt base course immediately prior to installation of top course, as shown on Drawings or directed by Engineer. Clean surface of sand and foreign matter, and dry before applying prime coat.

4. Provide minimum compacted thickness depth of hot mix asphalt surface course indicated on Drawings or as directed by Engineer to achieve finish grades.

5. Apply hot poured rubberized asphalt sealant to longitudinal and transverse joints.

6. Remove and replace defective mix not conforming to specified mix formula within stipulated tolerances on basis of testing. Samples of mixture in use will be taken as many times daily as necessary, and mixtures maintained uniform as specified. Owner may suspend further approval of plant mixtures in related Work if mixtures are not uniformly furnished as specified, until necessary changes have been made so mixtures conform to specified requirements.

7. Irregularities which may develop before completion of rolling, and while material is still workable, may be remedied by loosening surface mixture and removing or adding material as necessary. If irregularities or surface defects remain after final compaction, defective Work will be corrected by minor surface projections, joints, and minor honeycombed surfaces ironed out smoothly to grade, and as directed.

8. If any soft, imperfect places or spots develop on surface before final acceptance of Work, remove and replace with new materials and compact until edges of new Work seamlessly connect with old Work.

B. Install hot poured rubberized asphalt sealer on roadway cracks less than or equal to 1-inch width. Clean and dry crack to minimum depth of twice the crack width with a high-pressure air blast prior to placing sealer. Apply sealer according to manufacturer's recommendations.

C. Install hot mix asphalt by handwork on roadway surfaces in locations where irregularities, inaccessibility or other unavoidable obstacles prevent mechanical spreading and finishing.

D. Maintain safe passage of vehicular and pedestrian traffic and access and egress.

E. Set manhole covers and valve boxes flush with finish grade of top course.

F. Do not permit vehicular traffic or loads on newly completed pavement until adequate stability has been attained and material has cooled sufficiently to prevent distortion or loss of fines. If climate or other conditions warrant, the time-period for opening to traffic may be extended, at discretion of Owner.

3.03 RECLAMATION OF ROADWAY WITH PAVING

A. Locate and protect existing drainage and utility structures, underground pipes, culverts, conduits and other appurtenances prior to scarifying and pulverizing existing pavement. If upper sections of utilities are removed, immediately cover remaining part of structure with steel plate capable of withstanding 36.5-ton truckload with impact. Protect, remove or replace existing utility structures and boxes as part of Work.

B. Reclamation of paving includes scarifying and pulverizing in-place pavement and underlying material, mixing or blending material in depths specified on Drawings, followed by placing Type I-1 binder course in depths specified on Drawings and Type I-1 top course in depths specified on Drawings.

C. Remove unsuitable material in sub-grade to lines and depths established by Owner and dispose of legally. Replace with gravel borrow in accordance with MassDOT M1.03.0, Type B.

D. Placement: within limits of Work shown on Drawings.

3.04 TEMPORARY TRENCH PAVEMENT

A. Comply with the construction method requirements of MassDOT Section 420, MassDOT Section 460 and the Drawings.

B. Grade gravel base to the depths required for installation of temporary trench pavement and compact gravel base prior to installing pavement.

C. Install temporary trench pavement over gravel base to the limits and thickness shown on the Drawings. Compact temporary trench pavement in accordance with MassDOT Section 460.

D. Unless otherwise directed by Owner, temporary trench pavement shall remain in place for one winter season. Maintain temporary pavement and repair settlement or failures until permanent pavement is installed at no additional cost to the Owner.

E. No more than 1,000 linear feet of unpaved trenches shall be permitted at any time. The Owner reserves the right to further limit the length of unpaved trenches with no additional compensation to the Contractor.

F. Provide temporary trench paving for each trench excavated, excluding plated areas, at the end of each week, unless otherwise approved by Owner. Bring any trench excavated and left unpaved at the end of each workday, excluding plated areas, to uniform grade with gravel borrow or gravel base course. Provide that unpaved trench is level and smooth with surrounding pavement to minimize traffic impacts Unpaved trenches during holidays or over weekends are not be permitted.

3.05 PERMANENT TRENCH PAVEMENT

A. Comply with the construction method requirements of MassDOT Section 420 and MassDOT Section 460.

B. Remove temporary trench pavement to the depths and limits shown on the Drawings. Provide neat, straight cuts and square, vertical edges. Seal seams and joints with rubberized asphalt joint sealant.

C. Clean sand, dirt, debris and other foreign materials from surfaces before applying tack coat. Apply bituminous tack coat to clean, dry vertical edges and existing paved surfaces to bond existing and new pavement.

D. Provide necessary protection for roadway castings to prevent damage to castings and vehicles and ensure pedestrian safety.

E. Install hot mix asphalt base and top courses to the limits and lift depths required on the Drawings. Compact each lift in accordance with MassDOT Section 460. Match existing grades and install permanent trench pavement to maintain or improve existing drainage patterns.

3.06 HOT MIX ASPHALT BERM

A. Replace existing hot-mix asphalt berms damaged by the Work in kind. Provide foundation for hot-mix asphalt berms in accordance with the Drawings or as directed by Engineer, conforming to requirements for type of berm.

B. Place mixture and compact with machine approved by Owner for type of berm required.

3.07 PAVEMENT MARKINGS

A. Provide in accordance with Section 32 17 23.

3.08 FIELD QUALITY CONTROL

A. Provide in accordance with Division 01 General Requirements.

3.09 CLOSEOUT ACTIVITIES

A. Provide in accordance with Division 01 General Requirements.

3.10 MAINTENANCE

A. Maintain and repair trench width pavement during the 1 year Warranty Period. When required by Owner, replace trench pavement at no additional cost to Owner.

END OF SECTION

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SECTION 32 16 13

CURBS AND GUTTERS

PART 1 – GENERAL

1.01 SUMMARY

A. Section Includes

1. Provide curbs and gutters in accordance with this Section and applicable reference standards listed in Article 1.03.

1.02 PRICE AND PAYMENT PROCEDURES

A. Measurement and payment requirements: per Division 01 General Requirements.

1.03 REFERENCES

A. References Standards

1. Standard Specifications for Highways and Bridges, The Commonwealth of Massachusetts, Department of Transportation - Highway Division (MassDOT)

2. ASTM International (ASTM)

a. ASTM D1751 Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types)

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordination, sequencing, and scheduling: per Division 01 General Requirements.

1.05 SUBMITTALS

A. Submit in accordance with Division 01 General Requirements.

B. Shop Drawings

1. Dimensions of cut curbing

2. Manufacturers construction data for granite curbs

3. Manufacturers printed data on recommended installation procedures for granite curb

4. Manufacturers printed data on recommended installation procedures for slipform concrete curbing

C. Certificates: Manufacturer's certification that products meet Specification requirements

D. Design mix: Provide mix design for 4,000 psi concrete to be used for slipform curbing at least 20 days prior to start of placement

E. Closeout and Maintenance Material Submittals: per Division 01 General Requirements.

1.06 QUALITY ASSURANCE

A. Provide in accordance with Division 01 General Requirements.

1.07 DELIVERY, STORAGE AND HANDLING

A. Provide in accordance with Division 01 General Requirements.

1.08 SITE CONDITIONS

A. Existing Conditions: per Division 01 General Requirements.

PART 2 – PRODUCTS

2.01 PRODUCTS

A. Granite curb: Comply with material requirements of [DOT Standard Specification]

B. Bituminous asphalt curb: Comply with material requirements of [DOT Standard Specification]

C. Precast concrete curb: Comply with material requirements of [DOT Standard Specification]

D. Slipform concrete curb: Comply with material requirements of [DOT Standard Specification]

2.02 JOINT PAD

A. Bituminous fiber joint filler: preformed strips of composition below, complying with ASTM D1751.

2.03 SOURCE QUALITY CONTROL

A. Provide in accordance with Division 01 General Requirements.

PART 3 – EXECUTION

3.01 INSPECTION

A. Verify that earthwork is completed to correct line and grade.

B. Check that subgrade is smooth, compacted, and free of frost or excessive moisture.

C. Do not commence Work until conditions are satisfactory.

3.02 INSTALLATION

A. Granite curb: Comply with material requirements of [DOT Standard Specification].

B. Bituminous asphalt curb: Comply with material requirements of [DOT Standard Specification Section].

C. Precast concrete curb: DOT reference

D. Slipform concrete curb: DOT reference

3.03 BACKFILLING

A. Granite curb: DOT reference

B. Precast concrete curb: DOT reference

3.04 FIELD QUALITY CONTROL

A. Provide in accordance with Division 01 General Requirements.

3.05 CLOSEOUT ACTIVITIES

A. Provide in accordance with Division 01 General Requirements.

END OF SECTION

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SECTION 32 16 14

GRANITE CURBS

PART 1 – GENERAL

1.01 SUMMARY

A. Section Includes

1. Remove and reset, or provide new granite curbs in accordance with this Section and applicable reference standards listed in Article 1.03.

1.02 PRICE AND PAYMENT PROCEDURES

A. Measurement and payment requirements: per Division 01 General Requirements.

1.03 REFERENCES

A. Reference Standards

1. ASTM International (ASTM)

a. ASTM C144 Standard Specification for Aggregate for Masonry Mortar

b. ASTM C150 Standard Specification for Portland Cement

c. ASTM C207 Standard Specification for Hydrated Lime for Masonry Purposes

d. ASTM C615 Standard Specification for Granite Dimension Stone

2. MassDOT Standard Specifications and Supplements, and Construction Standard Details

a. MassDOT Supplemental Specifications Section 501

b. MassDOT Supplemental Specifications Section 580

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordination, sequencing, and scheduling: per Division 01 General Requirements.

1.05 SUBMITTALS

A. Submit in accordance with Division 01 General Requirements.

B. Product Data

C. Certificates: manufacturer's certification that products meet Specification requirements.

D. Manufacturer Instructions

E. Closeout and maintenance material submittals: per Division 01 General Requirements.

1.06 QUALITY ASSURANCE

A. Provide in accordance with Division 01 General Requirements.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Provide in accordance with Division 01 General Requirements.

B. Storage and Protection

1. Protect curb against staining, chipping, and other damage. Cracked, badly chipped, or stained units will be rejected.

2. Store granite curbing pallets on pavement or other hard, durable surface that will not compact from the weight. Prevent pallet steel strapping from rusting and staining pavement. Remove and replace pavement stained by rusting steel strapping.

1.08 SITE CONDITIONS

A. Existing conditions: per Division 01 General Requirements.

PART 2 – PRODUCTS

2.01 GRANITE CURBS

A. Type VA-4 in accordance with MassDOT Supplemental Specifications Section 501 and MassDOT Construction Standard Details.

2.02 MORTAR

A. Provide mortar composed of 1-part Type II portland cement in accordance with ASTM C150, 2-parts sand in accordance with ASTM C144, well graded with no grain larger than will pass #8 sieve, and 20 percent hydrated lime conforming to ASTM C207, Type S.

2.03 SOURCE QUALITY CONTROL

A. Provide in accordance with Division 01 General Requirements.

PART 3 – EXECUTION

3.01 INSPECTION

A. Verify that earthwork is completed to correct line and grade.

B. Confirm subgrade is smooth, compacted, and free of frost or excessive moisture.

3.02 REMOVAL AND RESETTING

A. Remove and reset curbs, curb inlets and curb corners at locations where required in accordance with MassDOT Supplemental Specifications Section 580, and MassDOT Construction Details. Incorporate existing curbs, curb inlets and curb corners before installation of new curb.

B. Remove existing curb in areas indicating remove, stack and reuse, and reinstall prior to installation of curb delivered to Site.

3.03 INSTALLATION

A. Install new curbs in accordance with MassDOT Supplemental Specifications Section 501, and Drawings.

B. Install ends of curbs vertically forming a flush joint when 2 curb stones are placed adjacent to each other.

1. Maximum joint space; not to exceed 3/4 inches.

2. Top 6 inches of curb stone: uniform thickness and surface finish.

3. Radii of curved curb stone: per Drawings.

3.04 FIELD QUALITY CONTROL

A. Provide in accordance with Division 01 General Requirements.

3.05 CLOSEOUT ACTIVITIES

A. Provide in accordance with Division 01 General Requirements.

END OF SECTION

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SECTION 32 17 23

PAVEMENT MARKINGS

PART 1 – GENERAL

1.01 SUMMARY

A. Section Includes

1. Provide pavement markings in accordance with this Section and applicable reference standards listed in Article 1.03.

1.02 PRICE AND PAYMENT PROCEDURES

A. Measurement and payment requirements: per Division 01 General Requirements.

1.03 REFERENCES

A. Reference Standards

1. MassDOT Standard Specifications and Supplements and Construction Details

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordination, sequencing, and scheduling: per Division 01 General Requirements.

1.05 SUBMITTALS

A. Submit in accordance with Division 01 General Requirements.

1. Product Data

2. Manufacturer Instructions

3. Certification that material does not exude fumes which are toxic or injurious to persons or property upon heating to application temperature

B. Closeout and maintenance material submittals: per Division 01 General Requirements.

1.06 QUALITY ASSURANCE

A. Provide in accordance with Division 01 General Requirements.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Provide in accordance with Division 01 General Requirements.

1.08 SITE CONDITIONS

A. Existing conditions: per Division 01 General Requirements.

PART 2 – PRODUCTS

2.01 THERMOPLASTIC

A. Provide in accordance with MassDOT Section 860, Section M9 and Supplemental Specifications.

B. Type: thermoplastic reflectorized type conforming to M7.01.03 White and M7.01.04 Yellow.

2.02 EPOXY PAINT

A. Formulate and design 2-component, 100 percent solids paint to provide a simple volumetric mixing ratio (e.g. 2-part component A to 1-part component B) specifically for service as a hot-spray applied binder for glass beads to produce maximum adhesion, refraction, and reflection. Material: epoxy resins and pigments only and meet the following minimum requirements:

1. Color White after drying at the specified thickness: flat white, free from tint, furnishing good opacity and visibility under both daylight and artificial light, and a match to Chip No. 17925 of Federal Standard 595.

2. Color Yellow after drying at the specified thickness: match to Chip No. 13538 of Federal Standard 595.

B. Provide paint well mixed in the manufacturing process and free from defects and imperfections that may adversely affect the serviceability of the finished product. Provide paint that will not liver, thicken, curdle, gel, settle excessively, or otherwise display any objectionable properties after storage and that which will not require mixing of individual components prior to use when stored for a maximum of 12 months.

C. Composition: per the manufacturer and the following requirements.

1. White: Titanium Dioxide Rutile 20 plus or minus 2 percent, by weight, ASTM D476 Type III Epoxy Resin 80 plus or minus 2 percent, by weight.

2. Yellow: Titanium Dioxide Rutile 14 plus or minus 3 percent, Organic Yellow 8 plus or minus 2 percent, by weight, ASTM D211 Type III Epoxy Resin 75 plus or minus 2 percent, by weight.

3. Test Epoxy Content (Component A of epoxy resin) per ASTM D1652 and calculate as weight per epoxide equivalent (WPE) for both white and yellow. Determine epoxy content by a pigment free basis. Ensure WPE meets a target value provided by manufacturer within a tolerance of plus or minus 50.

4. Test Amine Value (Component B) per ASTM D2074 to determine total amine value. Meet total amine target value provided by manufacturer within a tolerance of plus or minus 50. Obtain approval from Engineer if manufacturer specifies alternate test method for determining amine value.

5. Do not provide material that exude fumes which are toxic or injurious to persons or property upon heating to application temperature.

6. Abrasion Resistance (ASTM D4060) wear index: maximum 82 when abrasion resistance is tested with a CS-17 wheel under a load of 1,000 grams for 1,000 cycles.

7. Hardness (ASTM D2240) - Type D durometer hardness: minimum 75 and maximum 100 after conditioning material a minimum of 72 hours and maximum 96 hours at 73.4 degrees plus or minus 2 degrees F.

8. Tensile Strength (ASTM D638): The tensile strength of the material shall not be less than 6,000 psi after 72 hours of conditioning at 73.4 degrees plus or minus 2 degrees F.

9. Compressive Strength (ASTM D695): minimum 12,000 psi after 72 hours of conditioning at 73.4 degrees plus or minus 2 degrees F.

10. Conduct infrared spectrophotometer analysis per ASTM D2621, analyzing samples of both Part A and Part B (and of that mixed to proper ratio) by infrared spectrography. Spectrum of each component and final product: reasonable match to spectrum of original formulation from manufacturer.

11. Daylight directional reflectance without glass spheres (ASTM E1347): minimum 84 percent for white and minimum 50 percent for yellow (relative to magnesium oxide).

12. Dry Time for epoxy resin compounds

    a. Laboratory (per ASTM D711): a no-tracking condition in maximum 30 minutes at 72 degrees F when mixed in proper ratio and applied to a uniform wet film thickness of 20 mils and immediately dressed with glass beads at proper rate.

    b. Field: a no-tracking condition in a maximum of 30 minutes at 70 degrees F where no visual displacement of epoxy resin striping material is observed when a passenger car has passed over stripe or handwork when viewed at a distance of 50 feet.

2.03 SOURCE QUALITY CONTROL

A. Provide in accordance with Division 01 General Requirements.

PART 3 – EXECUTION

3.01 PREPARATION

A. Sweep or air blast dirty pavements. Remove and dispose of dirt piles. Remove oil, grease, and similar adherent matter by washing with a suitable solvent. Wipe excess solvent from pavement and allow time for evaporation before applying pavement marking material.

3.02 INSTALLATION

A. Apply thermoplastic markings after approval by Engineer and install pavement markings in accordance MassDOT Section 860, the MUTCD and Mass Amendments, and the Drawings.

B. Remove and replace unsatisfactory markings, resulting from the presence of dirt, oil, grease, scale, moisture, or other foreign substances, and pavement markings rejected by Engineer at no additional cost to Owner.

3.03 FIELD QUALITY CONTROL

A. Provide in accordance with Division 01 General Requirements.

3.04 CLOSEOUT ACTIVITIES

A. Provide in accordance with Division 01 General Requirements.

END OF SECTION

SECTION 32 90 00

PLANTING

PART 1 – GENERAL

1.01 SUMMARY

A. Section Includes

1. Provide loam borrow, topsoil, seeding, and supporting materials in accordance with this Section and applicable reference standards listed in Article 1.03.

B. Related Requirements

1. Section 31 00 00 – Earthwork

1.02 PRICE AND PAYMENT PROCEDURES

A. Measurement and payment requirements: per Division 01 General Requirements.

1.03 REFERENCES

A. Reference Standards

1. American National Standards Institute (ANSI)

a. ANSI Z60.1 American Standard for Nursery Stock

2. AOAC International (AOAC)

3. ASTM International (ASTM)

a. ASTM D75 Standard Practice for Sampling Aggregates

b. ASTM D698 Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort

c. ASTM D6913 Standard Test methods for Particle-Size Distribution (Gradation) of Soils Using Sieve Analysis

4. MassDOT

a. Standard Specifications and Supplements, and Construction Details

5. United States Department of Agriculture (USDA)

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordination, sequencing, and scheduling: per Division 01 General Requirements.

1.05 SUBMITTALS

A. Submit in accordance with Division 01 General Requirements.

B. Product Data

1. Seeding and planting fertilizer showing composition and analysis

a. Fertilization rates for fertilizer product based upon soil testing, analysis, and recommendations

b. Receipt showing total quantity purchased for Project prior to installation

C. Certificates: seeding and planting fertilizer composition and analysis.

D. Manufacturer Instructions

E. Source and Field Quality Control Submittals

1. Suppliers' certified analysis in accordance with AOAC for non-standard products.

2. Suppliers' certified analysis for soil amendments and fertilizer materials.

3. Seed Supplier's certified statement for each grass seed mixture required, stating botanical and common name, percentage by weight, and percentages of purity germination and weed seed for each grass seed species.

4. Certificates of agronomic rates from Supplier for organic matter used in loam borrow manufacturing process.

5. Supplier's certifications for peat moss, limestone, acidulants, gypsum, additives needed to amend a specific soil.

F. Provide submittals at least 30 days prior to ordering materials.

G. Closeout and maintenance material submittals: per Division 01 General Requirements.

1.06 QUALITY ASSURANCE

A. Provide in accordance with Division 01 General Requirements.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Provide in accordance with Division 01 General Requirements.

B. Packing, Shipping, Handling, and Unloading

1. Do not order or deliver material until submittals are approved.

2. Package products with manufacturers certified analysis.

1.08 SITE CONDITIONS

A. Existing conditions: per Division 01 General Requirements.

PART 2 – PRODUCTS

2.01 LOAM BORROW

A. Provide in accordance with MassDOT Section 751 and MassDOT Construction Details.

B. Type: MassDOT Section M1.05.0.

C. Furnish sufficient loam borrow to complete loaming operations required for Project and as directed by Engineer. Obtain loam borrow from the following sources and meet requirements specified after testing and addition of necessary soil additives.

1. Naturally well-drained areas that have never been stripped before and have a history of satisfactory vegetative growth. Comply with bylaws and Regulations regarding removal of topsoil.

2. Commercial processing facility specializing in manufacturing of loam.

2.02 TOPSOIL

A. Provide additional topsoil required to complete landscape work if quantity of stockpiled topsoil is insufficient.

B. Furnish new topsoil, which is fertile, friable, natural loam surface soil found at a depth of not less than 4 inches from original ground surface, reasonably free of subsoil, clay lumps, brush, weeds and other litter, and free of roots, stumps, debris, and stones larger than 2 inches in any dimension.

C. Obtain topsoil from local sources or from areas having similar soil characteristics as Site. Obtain topsoil only from naturally, well-drained Sites where topsoil occurs in a depth of not less than 4 inches. Do not obtain from bogs or marshes.

2.03 SEED AND SUPPORTING MATERIAL

A. Provide seed, limestone, fertilizers, plant materials, water for irrigation and soil conditioners in accordance with MassDOT Section 765.40 and MassDOT Construction Details, and ANSI Z60.1.

B. If biosolid compost (Massachusetts Department of Environmental Protection-permitted material) is used as an organic component of proposed planting soil mixture, amount of organic material used shall not exceed agronomic rates for nitrogen and phosphorus for trees and shrubs, turf or ornamental perennials.

2.04 PLANTING TREES, SHRUBS AND GROUNDCOVER

A. Furnish in accordance with MassDOT Section 771s.

B. Type: per MassDOT Section M6.06.1

2.05 GRASS SEED

A. Furnish fresh, clean, new crop seed, complying with tolerance for purity and germination established by AOSA. Do not use wet, moldy, or damaged seed. Seed mixtures listed below are proportions by weight.

1. Germination: minimum 80 percent.

2. Purity: minimum 85 percent.

3. Weed content: maximum 1 percent.

B. Roadside Mixture

1. 50 percent Creeping Red Fescue

2. 15 percent Kentucky Bluegrass

3. 2 percent Red Top Clover

4. 25 percent Annual Ryegrass

5. 3 percent Bird's Foot Trefoil, Variety Empire

6. 5 percent White Clover

C. Ecology Mixture

1. 50 percent Creeping Red Fescue

2. 5 percent White Clover

3. 15 percent Kentucky Bluegrass

4. 2 percent Red Top Clover

5. 25 percent Annual Ryegrass

6. 3 percent Bird's Foot Trefoil, Variety Empire

D. Wetlands Edge Mixture

1. 55 percent Tall Fescue

2. 10 percent Poa Trivialis

3. 15 percent Kentucky Bluegrass

4. 5 percent Redtop

5. 10 percent Perennial Ryegrass

6. 5 percent Reed Canary Grass

E. Lawn Repair Mixture

1. 60 percent Kentucky Bluegrass

2. 20 percent Perennial Ryegrass

3. 20 percent Chewings Fescue

2.06 FERTILIZER

A. Bone meal: commercial, raw or steamed, finely ground; minimum of 4 percent nitrogen and 20 percent phosphoric acid.

B. Superphosphate: commercial, phosphate mixture, soluble; minimum of 20 percent available phosphoric acid.

C. Fertilizer: commercial grade complete fertilizer of neutral character, consisting of fast and slow release nitrogen, 50 percent derived from natural organic sources of urea formaldehyde, phosphorous, and potassium in the following composition.

1. Nitrogen, phosphorous and potassium in amounts recommended in topsoil analysis reports from a qualified soil testing agency.

2. Minimum 1 pound per 1,000 square feet of actual nitrogen, 4 percent phosphorous and 2 percent potassium by weight.

2.07 EROSION AND SEDIMENTATION CONTROL

A. Anti-erosion mulch: clean, seed-free threshed straw of wheat, rye, oats, or barley. Do not use hay.

B. Erosion control mesh: uniform, open-weave jute matting or flexible vinyl mat. Acceptable level of quality: equivalent to Mira Mat erosion control.

C. Acceptable level of quality for re-vegetation mat: equivalent to TenCate Mirafi.

2.08 SOURCE QUALITY CONTROL

A. Provide in accordance with Division 01 General Requirements.

PART 3 – EXECUTION

3.01 GENERAL

A. Avoid damage to utilities, buildings and private property.

B. Do not disturb property markers.

C. Immediately report damage to Engineer.

D. Complete landscape work immediately as portions of Site become available, working within seasonal limitations for each kind work. Notify Engineer before planting if conditions detrimental to plant growth are encountered.

E. Plant or install materials during normal planting seasons for each type of landscape work required, and as specified in Section 32 72 00.

F. Use topsoil stockpiled for re-use as specified in Section 31 00 00.

3.02 LOAM BORROW

A. Place loam borrow at designated locations where plant material is to be installed or re-installed in accordance with MassDOT Section 751 and MassDOT Construction Details and Drawings, or as directed by Engineer.

B. Protect loam borrow delivered to Site from erosion and spread immediately. Cover material that sits on-Site for more than 24 hours with tarpaulin or other soil erosion system acceptable to Engineer, and surround with silt fence as shown on Drawings.

C. Do not handle, plant or use loam borrow if wet or frozen. Use moist loam borrow.

3.03 PLANTING TREES, SHRUBS AND GROUNDCOVER

A. Provide in accordance with MassDOT Section 771 and MassDOT Construction Details.

B. Type: per MassDOT Section M6.06.1

C. Prune injured roots or branches to make clean-cut ends prior to planting, utilizing clean, sharp tools, removing only injured or diseased branching.

D. Remove planting containers, baskets, and non-biodegradable materials from root balls during planting. Cut natural fiber burlap from around trunk of trees and folded down against root ball prior to backfilling.

E. Position trees and shrubs at intended locations shown on Drawings and obtain Engineer's approval prior to excavating pits, making necessary adjustments as directed.

F. Dig planting pits with level bottoms with width twice the diameter of root ball. Rest root ball on undisturbed grade. Backfill each plant pit in layers with thoroughly mixed, prepared soil; 1-part peat moss; 1-part composted cow manure by volume; 3 parts topsoil by volume.

1. Provide 21-gram planting tablets, acceptable level of quality: equivalent to Agriform.

a. 2 tablets per 1-gallon plant

b. 3 tablets per 5-gallon plant

c. 4 tablets per 15-gallon plant

d. Larger plants: 2 tablets per 1/2-inch caliper of trunk

G. Fill prepared soil around ball of plant halfway, and insert plant tablets. Complete backfill, and water thoroughly.

3.04 FINE GRADING

A. Clean subgrade of stones greater than 2 inches and all debris immediately prior to dumping and spreading loam borrow, and remove from Site. Do not rake to edges and bury. Obtain Engineer's approval of subgrade conditions prior to spreading loam borrow.

B. Spread and thoroughly incorporate soil additives into layer of loam borrow by harrowing or other approved methods. Incorporate the following soil additives.

1. Ground limestone or acidulants: as required by soil analysis to achieve required pH specified. Spread limestone at rate required by soil analysis up to maximum limit of 200 pounds per 1,000 square feet. Make a surface application of limestone not in excess of 50 pounds per 1,000 square feet to established planting area during the season after Final Acceptance if recommendations of soil analysis require rates of application greater than 200 pounds per 1,000 square feet.

2. Fertilize at rate and analysis recommended by soil analysis.

3. Use biosolid compost, peat moss, sand or other soil amendments as required by soil analysis.

C. Prepare loam borrow by scarifying, harrowing, or tilling loam to integrate soil additives into top 6 inches of loam after loam borrow and required additives have been spread. Remove large stiff clods, lumps, brush, roots, stumps, litter and other foreign matter. Remove all stones over 1-inch in diameter from top 6 inches of loam bed from unscreened soils. Remove smaller stones in excessive quantities as directed.

D. Set sufficient grade stakes for checking finished grades. Set stakes in bottom of swales and at top of slopes. Do not deviate more than one-tenth of foot from indicated elevations. Connect contours and spot elevations with an even slope. Finish grades: smooth and continuous with no abrupt changes at top or bottom of slopes.

E. Fill depressions caused by settlement or rolling during compaction process with additional loam borrow and regrade surface and roll until finish is smooth and even corresponding to required grades.

F. Install loam borrow in successive horizontal lifts no thicker than 6 inches in turf areas and 12 inches in plant bed areas to desired compaction as indicated. Install soil at a higher level to anticipate any reduction of loam borrow volume due to compaction, settling, erosion, and decomposition during Warranty Period. Obtain full depths of loam borrow for plant beds by digging holes in loam borrow at same frequency as for compaction testing.

1. Compact loam to specified density.

2. Maximum dry density for topsoil and loam: determined in accordance with ASTM D698. Achieve the following percentages of minimum to maximum dry densities for fill materials or prepared subgrades.

a. Fills within plant beds, tree pits and treeways: minimum 80 percent; maximum 85 percent for areas in top 18 inches of finished grade.

3. Scarify surface area of each lift by raking prior to placing next lift.

G. Compact each lift to reduce settling, but not enough to prevent movement of water and feeder roots through the soil in addition to range cited above. Loam borrow in each lift: firm underfoot and make only slight heel prints. Loam borrow at completion of installation: firm, even resistance when a soil sampling tube is inserted from lift to lift. Perform percolation tests after placement of each lift to determine if soil has been over compacted using the following percolation test procedure.

1. Dig a hole in installed soil minimum of 4 inches in diameter. Holes in 6-inch lift in turf areas: 4 inches deep. Holes in 12-inch lifts in plant beds: 8 inches deep. Do not penetrate through lift being tested.

2. Fill hole with water and let it drain completely. Immediately refill hole with water and measure rate of fall in water level.

3. Till soil to a depth required to break over compaction if water drains at a rate less than 1-inch per hour.

4. Perform a minimum of 1 soil percolation test per 10,000 square feet of turf area, and 2,500 square feet of tree and shrub planting area as directed.

H. Select equipment and phase installation of loam borrow so wheeled equipment does not travel over subsoil, placed fills or ordinary borrow, or already installed soil. Movement of tracked equipment over these soils will be reviewed and considered by Engineer for approval. If Engineer determines that wheeled equipment must travel over already installed soil, provide a written description of sequencing of Work that ensures compacted soil is loosened and uncompacted as Work progresses, or place 1-inch thick steel plate ballast or approved equivalent over length and width of any travelway to cover loam borrow to protect it from compaction.

I. Grade disturbed areas outside limit of Work, smooth and spread with minimum 6 inches of loam borrow to finished grade.

J. Maintain stockpiles of existing on-Site topsoil until final placement of existing on-Site topsoil and loam borrow is approved. Provide survey data plotted on a 20-scale plan of the Site prepared by a registered surveyor or civil engineer, showing volume of stockpiles of existing on-Site topsoil. Remove excess, unused existing on-Site topsoil from Site and legally dispose of upon approval.

3.05 SEED AND SUPPORTING MATERIAL

A. Install and apply seed and supporting materials at rates of application in accordance with MassDOT Section 765.40 and MassDOT Construction Details and the Drawings.

3.06 HYDROSEEDING NEW AREAS

A. Mix specified seed and pulverized mulch in water, using equipment specifically designed for hydroseed application. Continue mixing until uniformly blended into homogenous slurry suitable for hydraulic application.

B. Apply slurry using an approved machine. Seed and suitable corn fiber mulch may be applied in 1 operation. Mix materials with water in machine and agitate to keep mixture uniformly suspended. Use spraying equipment that will distribute slurry uniformly at required rates.

C. Mulch areas with anti-erosion mulch with mulch blower at rate of 1,200 pounds per acre on level grades, 2,000 pounds on slopes if mulch is not part of slurry, immediately following hydroseeding.

D. Seed only areas that can be mulched on same day.

3.07 SEEDING NEW AREAS

A. Sow seed using a spreader or seeding machine. Do not seed when wind velocity exceeds 5 miles per hour. Distribute seed evenly over entire area by sowing equal quantity in 2 directions at right angles to each other.

B. Do not sow immediately following rain or when ground is too dry.

C. Seed application rate

1. 1 pound per 1,000 square feet.

D. Rake seed lightly into top 1/8 inch of soil, roll lightly, and water with fine spray.

3.08 PROTECTION OF SEEDED SLOPES

A. Protect seeded slopes against erosion with erosion netting or other acceptable methods.

B. Spread specified mulch after completion of seeding operations to form a continuous blanket not less than 1-1/2 inches' loose measurement over seeded areas.

C. Anchor mulch by spraying with asphalt emulsion at rate of 10 to 13 gallons per 1,000 square feet. Prevent damage or staining of construction or other plantings adjacent to mulched areas.

D. Cover seeded slopes with jute matting where grade is 3:1 or greater. Roll matting down over slopes without stretching or pulling.

E. Lay matting smoothly on soil surface, burying top end of each section in narrow 6-inch trench. Leave 12-inch overlap from top roll over bottom roll. Leave 4-inch overlap over adjacent section.

F. Staple outside edges and overlaps at 36-inch intervals.

G. Lightly dress slopes with topsoil to ensure close contact between matting and soil.

H. Unroll matting in direction of flow in ditches. Overlap ends of strips 6 inches with upstream section on top.

3.09 FIELD QUALITY CONTROL

A. Provide in accordance with Division 01 General Requirements.

B. Replace rejected Work, and continue specified maintenance until re-inspected by Engineer and accepted. Remove rejected plants and materials promptly from Site.

3.10 CLEANING

A. Keep pavement, sidewalks, and walkways clean. Maintain protection during installation and maintenance periods.

3.11 CLOSEOUT ACTIVITIES

A. Provide in accordance with Division 01 General Requirements.

3.12 MAINTENANCE

A. Provide maintenance of grass seeded areas immediately after planting.

B. Maintain grass by watering, fertilizing, weeding, mowing, trimming, and other operations such as rolling, re-grading, and replanting as required to establish smooth, acceptable lawn areas free of eroded or bare areas.

C. Maintain grassed areas to establish acceptable lawn until Final Completion or for a minimum of 180 days, whichever is longer, by watering, fertilizing, weeding, mowing, trimming, and other operations such as rolling, re-grading, and replanting as required to establish a smooth, acceptable lawn, free of eroded or bare areas.

D. Maintain trees and shrubs until Final Completion, or for a minimum of 180 days, whichever is longer.

END OF SECTION

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SECTION 33 01 10.58

DISINFECTION OF WATER UTILITY PIPING SYSTEMS

PART 1 – GENERAL

1.01 SUMMARY

A. Section Includes

1. Provide disinfection of water utility piping systems in accordance with this Section and applicable reference standards listed in Article 1.03.

B. Related Requirements

1. Section 33 14 11.01 – Water Utility Piping – Ductile Iron

2. Section 33 14 19 – Valves and Hydrants for Water Utility Service

3. Section 33 14 21 – Water Service Connections - Copper

1.02 PRICE AND PAYMENT PROCEDURES

A. Measurement and payment requirements: per Division 01 General Requirements.

1.03 REFERENCES

A. Reference Standards

1. American Water Works Association (AWWA)

a. AWWA B300 Hypochlorites

b. AWWA C651 Disinfecting Water Mains

c. AWWA C655 Field Dechlorination

2. NSF International (NSF)

a. NSF/ANSI 60 Drinking Water Treatment Chemicals – Health Effects

b. NSF/ANSI 61 Drinking Water System Components – Health Effects

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordination, sequencing, and scheduling: per Division 01 General Requirements.

B. Perform disinfection after completing preliminary flushing of water utility piping systems, and after pressure and leakage testing of water utility piping systems are complete and approved by Engineer.

C. Coordinate final flushing with Owner.

1.05 SUBMITTALS

A. Submit in accordance with Division 01 General Requirements.

B. Product data: Safety Data Sheets (SDS).

C. Certificates

1. Certificate of compliance verifying independent commercial laboratory performing bacteriological sampling analyses is certified with the state Department of Environmental Protection for analyzing public drinking water supplies.

2. Certified bacteriological test results

D. Source and field quality control submittals

1. Disinfection procedures, including flushing locations, rates of flushing, discharge locations, chlorine form, method of chlorination, procedures for measuring potable water supply, procedures for measuring free chlorine residual, sampling locations and number and frequency of samples for bacteriological tests.

2. Dechlorination plan

3. Free chlorine residual test results

E. Qualification statements: names and qualifications of personnel or firm performing disinfection and dechlorination work.

F. Closeout and maintenance material submittals: per Division 01 General Requirements.

1.06 QUALITY ASSURANCE

A. Provide in accordance with Division 01 General Requirements and Owner's requirements.

B. Qualifications: per Division 01 General Requirements and as follows.

1. Trained personnel or firm with minimum 5 years' experience with disinfection and dechlorination of water utility piping systems.

C. Regulatory approvals

1. Chemicals in contact with raw or drinking water meeting NSF 60 Drinking Water Treatment Chemicals – Health Effects.

2. Products in contact with raw or drinking water meeting NSF 61 Drinking Water System Components – Health Effects.

D. Independent testing: bacteriological analyses by an independent commercial laboratory certified by the State Department of Environmental Protection for analyzing public drinking water supplies.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Provide in accordance with Division 01 General Requirements.

1.08 SITE CONDITIONS

A. Existing conditions: per Division 01 General Requirements.

PART 2 – PRODUCTS

2.01 MATERIALS

A. Chlorine: liquid sodium hypochlorite or granular calcium hypochlorite conforming to AWWA B300.

2.02 SOURCE QUALITY CONTROL

A. Provide in accordance with Division 01 General Requirements.

PART 3 – EXECUTION

3.01 DISINFECTION

A. Disinfect new water utility piping systems utilizing continuous-feed method in accordance with AWWA C651 before being placed into service.

B. Utilize potable water from existing distribution system or other sources of supply approved by Owner.

C. Prevent contaminated or highly chlorinated water from entering existing, new or previously disinfected water utility piping systems.

D. Dechlorination procedures: in accordance with AWWA C655.

E. Provide chemical feed pumps for chlorine solutions to provide accurate measurement of chlorine being introduced.

F. Provide sampling taps in accordance with AWWA C651. At a minimum, provide sampling taps at each end of the new main at 1,200 linear foot intervals, and at least one sample from each branch line greater than one pipe length. Do not use fire hydrants as sampling locations.

G. Disinfect final connections to existing mains according to AWWA C651.

3.02 FINAL FLUSHING

A. Flush new water utility piping systems according to AWWA C651 following a minimum 24-hour disinfection retention period with a free chlorine residual of not less than 10 mg/l. Prevent contaminated or highly chlorinated water from entering existing, new or previously disinfected piping systems.

B. Flush using water from existing mains. Coordinate flushing with Owner and take necessary measures to prevent damage or flooding to adjacent properties. Flushing velocities: minimum 3 feet per second in accordance with AWWA C651. Refer to AWWA C651 for required flow rates.

C. After retention period described above, flush heavily chlorinated water using water from existing water mains. Coordinate flushing with Owner and take necessary measures to prevent damage or flooding to adjacent properties. Continuously flush heavily chlorinated water until background conditions are restored.

D. Neutralize chlorine residual of disposed flushing water by chemical dechlorination according to AWWA C655. Provide equipment to dechlorinate at flushing rates indicated.

E. Comply with Federal, State and local regulations for disposal of flushing water.

3.03 BACTERIOLOGICAL TESTS

A. Collect samples at each sampling location according to AWWA C651 after final flushing and before water utility piping systems are placed into service.

B. Perform sampling according to Option A of AWWA C651 Section 5.1.1.1, unless otherwise approved by Owner.

C. Passing laboratory results: absence of any coliform bacteria and heterotrophic plate count (HPC) less than 500/ml in both sets of samples.

A. Re-flush and re-sample water utility piping systems if either set of samples fails to produce passing results according to AWWA C651. If resampling results fail, re-chlorinate, re-flush and re-sample according to AWWA C651 until passing results are obtained.

3.04 REPAIR/RESTORATION

A. Remove temporary blow-off and sample lines down to corporation stop once water utility piping system has been accepted and placed into service. Cap corporation stop.

3.05 FIELD QUALITY CONTROL

A. Provide in accordance with Division 01 General Requirements.

B. Provide field testing of free chlorine residuals to ensure appropriate concentrations are being achieved during disinfection according to AWWAC651, and during flushing water disposal according to AWWA C655.

3.06 CLOSEOUT ACTIVITIES

A. Provide in accordance with Division 01 General Requirements.

END OF SECTION

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SECTION 33 14 11.01

WATER UTILITY PIPING - DUCTILE IRON

PART 1 – GENERAL

1.01 SUMMARY

A. Section Includes

1. Provide ductile iron water utility piping, fittings, couplings and joint restraints in accordance with this Section and applicable reference standards listed in Article 1.03.

B. Related Requirements

1. Section 01 50 00 – Temporary Facilities and Controls
2. Section 01 51 38 – Temporary Water Bypass
3. Section 02 61 05 – Removal and Disposal of Contaminated Soil and Water
4. Section 31 00 00 – Earthwork
5. Section 32 12 16 - Asphalt Paving
6. Section 32 16 13 – Curbs and Gutters
7. Section 32 16 14 - Granite Curbs
8. Section 32 90 00 - Planting
9. Section 33 01 10.58 – Disinfection of Water Utility Piping Systems
10. Section 33 14 19 – Valves and Hydrants for Water Utility Service
11. Section 33 14 20 – Water Service Connections – Polyethylene
12. Section 33 14 21 – Water Service Connections - Copper

1.02 PRICE AND PAYMENT PROCEDURES

A. Measurement and payment requirements: per Division 01 General Requirements.

1.03 REFERENCES

A. Reference Standards

1. ASTM International (ASTM)

a. ASTM A242 Standard Specification for High-Strength Low-Alloy Structural Steel

b. ASTM A283 Standard Specification for Low and Intermediate Tensile Strength Carbon Steel Plates

c. ASTM A536 Standard Specification for Ductile Iron Castings

d. ASTM C518 Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus

e. ASTM D638 Standard Test Method for Tensile Properties of Plastics

f. ASTM D790 Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials`

g. ASTM D1248 Standard Specification for Polyethylene Plastics Extrusion Materials for Wire and Cable

h. ASTM D1622 Standard Test Method for Apparent Density of Rigid Cellular Plastics

i. ASTM D6226 Standard Test Method for Open Cell Content of Rigid Cellular Plastics

j. ASTM D3350 Standard Specification for Polyethylene Plastics Pipe and Fittings Materials

2. American Water Works Association (AWWA)

    a. AWWA C104 Cement-Mortar Lining for Ductile-Iron Pipe and Fittings

    b. AWWA C110 Ductile-Iron and Gray-Iron Fittings

    c. AWWA C111 Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings

    d. AWWA C151 Ductile-Iron Pipe, Centrifugally Cast

    e. AWWA C153 Ductile-Iron Compact Fittings

    f. AWWA C219 Bolted Sleeve-Type Couplings for Plain-End Pipe

    g. AWWA C600 Installation of Ductile-Iron Mains and Their Appurtenances

    h. AWWA C651 Disinfecting Water Mains

    i. AWWA M41 Ductile-Iron Pipe and Fittings

3. Ductile Iron Pipe Research Association (DIPRA)

    a. Thrust Restraint Calculator

4. NSF International (NSF)

    a. NSF/ANSI 61 Drinking Water System Components-Health Effects

    b. NSF/ANSI 372 Drinking Water System Components – Lead Content

5. Underwriters Laboratories (UL)

6. Factory Mutual (FM)

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordination, sequencing, and scheduling: per Division 01 General Requirements.

1.05 SUBMITTALS

A. Submit in accordance with Division 01 General Requirements.

B. Product data: manufacturer’s data including dimensions, coatings, and installation instructions for each product.

C. Manufacturers' certificates verifying conformance

D. Source and field quality control submittals: inspection and testing logs, and test results.

E. Closeout and maintenance material submittals: per Division 01 General Requirements.

1. Record depth and take ties as directed by Engineer for construction records.

1.06 QUALITY ASSURANCE

A. Provide in accordance with Division 01 General Requirements.

B. Regulatory approvals

1. Comply with state and local plumbing codes. If there are conflicts, apply the more stringent code.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Provide in accordance with Division 01 General Requirements.

B. Handle according to AWWA C600.

C. Packing, shipping, handling, and unloading

1. Protect flanges and fittings from moisture and dirt by storing inside or package with durable, waterproof wrapping.

2. Unload and string pipe. Lift pipe off truck and place on ground according to manufacturer's recommendations. Do not roll pipe off the truck or drop. Stack pipe maximum 3 layers high with proper blocking between layers.

D. Acceptance at Site

1. Confirm each shipment of pipe, fittings, and appurtenances includes manufacturers' Certificate of Conformance.

2. Inspect upon delivery and reject pipe not in conformance with specified requirements, or damaged beyond repair. Immediately remove damaged pipe from Site and dispose of legally.

1.08 SITE CONDITIONS

A. Existing conditions: per Division 01 General Requirements.

PART 2 – PRODUCTS

2.01 GENERAL

A. Pipe, fittings and joint restraints: in accordance with NSF 61 and NSF/ANSI 372 as applicable.

B. Furnish products manufactured in the United States.

2.02 DUCTILE IRON PIPE

A. Conform to AWWA C151.

B. Thickness: Class 52.

C. Diameter: as shown on Drawings.

D. Joint type: rubber gasketed, push-on conforming to AWWA C111.

E. Pipe lubricant: suitable for use in potable water supply.

F. Interior lining: double thickness cement mortar lining and asphaltic seal coat conforming to AWWA C104.

G. Exterior: asphaltic coating conforming to AWWA C151.

H. Manufacturers

1. U.S. Pipe

2. American Cast Iron Pipe Company

3. McWane Ductile

4. Or equal

2.03 PRE-INSULATED DUCTILE IRON PIPE

A. Provide pre-insulated ductile iron pipe conforming to criteria specified above for ductile iron pipe.

B. Insulation: foamed in place closed cell polyurethane which completely fills annular space between carrier pipe and exterior casing. The ends of the insulation shall be mastic sealed. The insulation shall have the following physical properties:

1. Minimum Density (pounds per cubic foot): 2.1 per ASTM D1622.

2. “K” Factor BTU/ Hr. Sq. ft. degrees F/in.: 0.147 per ASTM C518.

3. Closed Cell: 90 percent to 95 percent per ASTM D6226.

C. Exterior casing: seamless high density polyethylene (HDPE) ASTM D1248 with the following physical properties. Tape casings shall not be permitted.

1. Ultimate Elongation: 850 percent per ASTM D638.

2. Tensile Yield Strength: 3,300 psi per ASTM D638.

3. Type: Resin Type III, Grade P34 per ASTM D3350.

4. Tangent Flexural Modules: 175,000 psi per ASTM D790.

D. Fittings: mechanical joint and restrained with a mechanical joint retainer gland per AWWA C110 and AWWA C111.

E. All straight joints with an HDPE jacket shall be covered with a wrap of Polyken Tape and covered with an HDPE rockshield.

F. Pre-insulated pipe shall be placed on a 6-inch layer of sand, tamped to provide a stable and uniform bedding, and carefully backfilled and covered with 12-inches of sand, compacted in 6-inch maximum lifts.

2.04 FITTINGS

A. Performance/Design Criteria

1. Ductile iron fittings: in accordance with AWWA C110 or AWWA C153.

2. Rated working pressure: 350 psi for 3-inch through 24-inch diameter and 250 psi working pressure for 30-inch through 48-inch diameter.

3. Joint type: mechanical.

4. Interior lining: double thickness cement mortar lining and asphaltic seal coat conforming to AWWA C104.

5. Exterior: asphaltic coating conforming to AWWA C151.

B. Manufacturers

1. U.S. Pipe

2. American Cast Iron Pipe Company

3. Tyler Union

4. Or equal

2.05 SOLID SLEEVE COUPLINGS

A. Performance/Design Criteria

1. Type: restrained solid sleeve.

2. Conform to AWWA C153 and AWWA C-111 for joints and AWWA C-104 for cement lining.

3. Rated working pressure: 350 psi for 3-inch through 24-inch diameter and 250 psi working pressure for 30-inch through 48-inch diameter.

4. Coating: Asphaltic seal coated in and out in accordance with AWWA C-104.

5. Gasket: SBR in accordance with AWWA C-111.

B. Manufacturers

1. Tyler Union

2. U.S. Pipe

3. American Cast Iron Pipe Company

4. Or equal

2.06 BOLTED COUPLINGS

A. General Performance/Design Criteria

1. Fusion bonded, epoxy coated ductile iron conforming to ANSI/NSF 61, ASTM A-536, and applicable requirements of AWWA C219.

2. Rated working pressure: 250 psi.

3. End rings: color coded for pipe type and constructed of ductile iron, meeting or exceeding the requirements of ASTM A-536.

4. Gaskets: Styrene Butadiene Rubber (SBR) in accordance with ASTM D 2000 and embossed with size and end ring color code.

5. Nuts and bolts: steel conforming to ASTM A242 and AWWA C11.

B. Manufacturers

1. Ford Meter Box Company, Inc.

2. Mueller Co. LLC

3. Romac Industries, Inc.

4. Or equal

2.07 JOINT RESTRAINT

A. Combine the use of concrete thrust blocks and restrained joints, unless otherwise approved in writing by Owner.

B. Concrete thrust blocks: 3,000 psi concrete minimum and sized according to thrust block schedule shown on Drawings.

C. Mechanical Joint Restraint

1. Type: mechanical joint restraint gland with multiple gripping wedges and designed for all classes of ductile iron pipe with torque limiting twist off nuts. Approved for use by pipe and fitting manufacturers. Minimum safety factor shall be 2:1.

2. Materials: grade 65-45-12 ductile iron conforming to ASTM A536 for gland body, wedge and wedge actuating components.

3. Wedges: heat treated to hardness range of 370 to 470 Brinell Hardness Number (BHN).

4. Rated working pressure: 350 psi for 3-inch to 16-inch diameter and 250 psi for 18-inch to 48-inch diameter.

5. Underwriter Laboratories, Inc. (UL) listed and Factory Mutual (FM) approved.

6. Coating: minimum 2 coats of fusion bonded epoxy.

7. Manufacturers

a. EBAA Iron Inc

b. Tyler Union

c. Romac Industries, Inc.

d. Or equal

D. Push-on joint restraint

1. Type: rubber gasket with high-strength stainless steel locking segments spaced around the gasket and compatible with pipe and fittings.

2. Conform to AWWA C111.

3. Rated working pressure: 350 psi up to 24-inch diameter.

4. Underwriters Laboratories, Inc. (UL) listed and Factory Mutual (FM) approved.

5. Manufacturers

   a. U.S. Pipe

   b. American Cast Iron Pipe Company

   c. McWane Ductile

   d. Or equal

2.08 NUTS AND BOLTS

A. Provide high strength low alloy carbon steel per AWWA C111.

B. Nuts: 316 Stainless Steel with fluoropolymer coated.

2.09 SOURCE QUALITY CONTROL

A. Provide in accordance with Division 01 General Requirements.

PART 3 – EXECUTION

3.01 GENERAL

A. Coordinate Work with Owner and Engineer.

B. Perform excavation and backfill according to Section 31 00 00.

C. Install according to manufacturer’s installation instructions, AWWA C600, AWWA C651, as shown on Drawings and as specified.

D. Comply with the requirements of AWWA C600 and Section 4.8 of AWWA C651 for cleanliness.

3.02 INSTALLATION

A. Make joints in dry trench according to manufacturer's recommendations and best practices for class of exterior pipe laid. Wipe ends of pipe clean with dry cloth before making joint.

B. Lay pipe to line and grades shown on Drawings. Line and grade may be adjusted by Engineer to meet field conditions.

C. Install pipe with minimum 5 feet of cover, measured from pipe crown to finished grade, as shown on Drawings or approved by Engineer.

D. Use off-sets or joint deflection according to allowances specified to transition from existing pipe elevation to new pipe elevation with less than 5 feet of cover.

1. Insulate pipe within 3 feet of culvert or with less than 5 feet of cover with minimum 4-inch, 40-pound density Styrofoam material. Extend insulation the width of the trench, minimum 4 feet above pipe envelope and on vertical sides of trench bottom from bottom to above pipe envelope.

2. Joint deflection: according to AWWA C600 or maximum allowable deflection permitted by manufacturer.

3. Install pipe beginning at stub end unless otherwise approved by Engineer. Clean interior of pipe length before laying next length. Cover pipe end with construction cap when Work is stopped temporarily or for extended period. Keep trench free from water. Do not lay or test pipe in a wet trench. Do not cover or backfill trench until approved by Engineer.

E. Pre-Insulated Pipe

1. Cover straight joints with HDPE jacket with wrap of Polyken tape and covered with an HDPE rockshield.

2. Place pre-insulated pipe on 6-inch layer of sand, tamped to provide a stable and uniform bedding and carefully backfill and covered with 12-inches of sand, compacted in 6-inch maximum lifts.

F. Pipe Cutting

1. Cut pipe to provide shorter sections for insertion of valves, fittings or closure pieces, conforming to methods recommended by pipe manufacturer and AWWA C600.

2. Cut end of pipe square to the axis of the pipe, grind any rough edges smooth, and bevel per manufacturer’s recommendations where being used for push-on joints.

G. Thrust Restraint

1. Provide mechanical joint restraint at all mechanical joints.

2. Provide approved restraining gasket in joints prior to and after fitting. Refer to Article 3.02 G for restraining lengths.

3. Utilize both concrete thrust blocks and restrained joints.

4. Cast concrete against undisturbed earth and place support to not interfere with making joints. Protect bolts with ASTM Type 15 roofing felt or equivalent.

H. Length of restrained joints: as specified on Drawings.

1. Anticipate and install restraints prior to fitting or valve.

2. Calculate restrained piping required on both sides of fitting or valve using DIPRA thrust restraint calculator available at www.dipra.org. Use worst case conditions for laying condition and soil designation.

a. Design pressure: minimum 150 psi.

b. Safety factor: minimum 1.5.

3. Confirm restraint lengths with Engineer prior to installation.

I. Repair clamps are not considered permanent repairs. Cut out defective sections and replace using solid sleeve couplings.

J. Lay pipe to point directed where connecting pipe or structures have not yet been installed. Plug or cap end. Identify terminal point with stake extending above ground, marked to indicate size and service. Provide temporary thrust restraint as required.

A. Vertical Separation from Sanitary Sewer

1. Where water mains cross sewers:

a. Vertical separation: minimum 18 inches between the invert of the water main and crown of the sewer wherever possible.

b. Structural support: adequate for sewers to prevent excessive deflection of joints and settling on and breaking water lines.

c. Center 1 full length of water pipe at point of crossing so joints will be equal distance and as far from sewer as possible.

B. Parallel Separation from Sanitary Sewer

1. Lay water lines minimum 10 feet horizontally, edge to edge, from sewers, sewer services or sewer manholes. Where Site conditions prevent 10 feet of horizontal separation, install water main in accordance with the following.

a. Install invert of the water main a minimum 18 inches above crown of the sewer on undisturbed earth shelf on one side of sewer; or

b. provide separation as shown on the Drawing details where 18 inches of vertical separation cannot be achieved.

c. In lieu of the concrete encasement shown on the Drawing details, install a carrier pipe for the water main, constructed of AWWA approved water main materials with minimum pressure rating of 150 psi.

1) Joints in carrier pipe: rated to 150 psi.

2) Provide approved pipe support spacers to support water main in annular space of carrier pipe and install per manufacturer requirements.

3) Provide watertight seal at each end of carrier pipe.

C. Separation of Water Line from Cable TV Lines, Telephone Lines, and Electrical Cables

1. Horizontal separation: minimum 5 feet from outside edge of pipe to outside edge of utility or duct bank.

2. Crossings: minimum 18 inches of vertical separation above or below utility. Where Site conditions prevent ability to meet vertical separation requirement and bury depth requirements, insulate water main as specified o, provide minimum 6 inches of vertical separation and concrete encase water main a minimum of 5 linear feet on either side of crossing where approved by Owner. Measurement: perpendicular to the crossing.

3.03 FILLING AND PRELIMINARY FLUSHING

A. Fill and flush new water utility piping system according to AWWA C600 and AWWA C651 prior to performing water main testing. Prevent contaminated water from entering existing, new or previously disinfected piping systems.

B. Fill pipe with potable water and eliminate air pockets and avoid excessive surges.

C. Conduct preliminary flushing of new water mains to remove particulates in accordance with AWWA C651 prior to beginning disinfection in accordance with Section 33 01 10.58.

1. Flushing velocities: minimum 3 feet per second.

2. Required flow rates: per Section 4.4.2 of AWWA C651.

D. Coordinate flushing with Owner and take necessary measures to prevent damage or flooding.

3.04 WATER MAIN TESTING

A. Perform pressure and leakage tests according to AWWA C600 and requirements below after preliminary flushing, witnessed by Engineer.

1. Hydrostatic testing: minimum of 2 hours. Test pressure: 1.5 times working pressure at lowest point, not less than 150 psi. Do not allow test pressure to exceed rated working pressure for any joint, restraint, valve, fitting, or connected appurtenance.

2. Determine allowable leakage for ductile iron pipe as follows.

$$L = \frac{SD\,P^{\frac{1}{2}}}{148{,}000}$$

Where L is allowable leakage in gallons per hour, S is length of pipe in feet, D is nominal diameter in inches, and P is average test pressure in psi.

a. Recommended Allowable Leakage Per 1,000-Feet of Pipeline in Gallons per Hour

Average Test Pressure (psi)	NOMINAL PIPE DIAMETER - INCHES					
	4	6	8	10	12	16
450	0.57	0.86	1.15	1.43	1.72	2.29
400	0.54	0.81	1.08	1.35	1.62	2.16
350	0.51	0.76	1.01	1.26	1.52	2.02
300	0.47	0.70	0.94	1.17	1.40	1.87
275	0.45	0.67	0.90	1.12	1.34	1.79
250	0.43	0.64	0.85	1.07	1.28	1.71
225	0.41	0.61	0.81	1.01	1.22	1.62
200	0.38	0.57	0.76	0.96	1.15	1.53
175	0.36	0.54	0.72	0.89	1.07	1.43
150	0.33	0.50	0.66	0.83	0.99	1.32
125	0.30	0.45	0.60	0.76	0.91	1.21
100	0.27	0.41	0.54	0.68	0.81	1.08

b. Allowable leakage will be the sum of computed leakage for each size if pipeline under test contains sections of various diameters.

c. Refer to AWWA C600 for additional pipe diameters and test pressures.

3.05 ABANDONED UTILITIES

A. Close open ends of abandoned underground utilities not designated for removal. Provide closure to withstand hydrostatic or earth pressure which may result after ends of abandoned utilities have been closed.

B. Obtain approval of Owner and Engineer prior to backfilling.

3.06 FIELD QUALITY CONTROL

A. Provide in accordance with Division 01 General Requirements.

3.07 REPAIR/RESTORATION

A. Repair leaks and defective Work by cutting and removing defective section. Replace with new materials meeting specified requirements. Connect replaced sections with solid sleeves. Pressure test, chlorinate and bacteria test repaired section as required by Owner.

B. Restore disturbed surface areas as follows.

1. Paved areas, including bituminous curbing and bituminous sidewalks: per Section 32 12 16.

2. Granite curbing: per Section 32 16 14.

3. Lawn areas: per Section 32 90 00.

3.08 CLOSEOUT ACTIVITIES

A. Provide in accordance with Division 01 General Requirements.

END OF SECTION

SECTION 33 14 19

VALVES AND HYDRANTS FOR WATER UTILITY SERVICE

PART 1 – GENERAL

1.01 SUMMARY

A. Section includes

1. Provide valves, hydrants, and appurtenances in accordance with this Section and applicable reference standards listed in Article 1.03.

a. Provide Mueller Super Centurion 250 as specified. The Owner has determined that this equipment can be provided by at least 3 Suppliers which meets the requirements of the applicable Law to allow for competition.

B. Related Requirements

1. Section 01 50 00 – Temporary Facilities and Controls
2. Section 01 51 38 – Temporary Water Bypass
3. Section 02 61 05 – Removal and Disposal of Contaminated Soil and Water
4. Section 31 00 00 – Earthwork
5. Section 32 12 16 – Asphalt Paving
6. Section 32 16 13 - Curbs and Gutters
7. Section 32 16 14 – Granite Curbs
8. Section 32 90 00 – Planting
9. Section 33 14 11.01 – Water Utility Piping - Ductile Iron

1.02 PRICE AND PAYMENT PROCEDURES

A. Measurement and payment requirements: per Division 01 General Requirements.

1.03 REFERENCES

A. Reference Standards

1. American Society of Mechanical Engineers (ASME)

a. ASME B16.1 Gray Iron Pipe Flanges and Flanged Fittings: Classes 25, 125, and 250

2. ASTM International (ASTM)

   a. ASTM A48 Standard Specification for Gray Cast Iron Castings

   b. ASTM A536 Standard Specification for Ductile Iron Castings

   c. ASTM B98 Standard Specification for Copper-Silicon Alloy Rod, Bar and Shapes

3. American Water Works Association (AWWA)

   a. AWWA C111 Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings

   b. AWWA C502 Dry-Barrel Fire Hydrants

   c. AWWA C509 Resilient-Seated Gate Valves for Water Supply Service

   d. AWWA C515 Reduced-Wall, Resilient-Seated Gate Valves for Water Supply Service

   e. AWWA C550 Protective Interior Coatings for Valves and Hydrants

   f. AWWA C600 Installation of Ductile-Iron Mains and Their Appurtenances

   g. AWWA C651 Disinfecting Water Mains

      1) Section 4.8 Preventive and Corrective Measures During New Construction

4. Manufacturers Standardization Society (MSS)

   a. MSS SP-60 Connecting Flange Joints Between Tapping Sleeves and Tapping Valves

5. NSF International (NSF)

   a. NSF/ANSI 61 Drinking Water System Components - Health Effects

   b. NSF/ANSI 372 Drinking Water System Components – Lead Content

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordination, sequencing, and scheduling: per Division 01 General Requirements.

1.05 SUBMITTALS

A. Submit in accordance with Division 01 General Requirements.

B. Product data: manufacturer's product data and installation instructions for each product specified.

C. Shop Drawings

D. Certificates: manufacturer's notarized certificate, certifying conformance to accompany shipments.

E. Closeout and maintenance material submittals: per Division 01 General Requirements.

1.06 QUALITY ASSURANCE

A. Provide in accordance with Division 01 General Requirements.

B. Comply with requirements of AWWA C600, and Section 4.8 of AWWA C651 for cleanliness.

C. Comply with the requirement of NSF/ANSI 61 and NFS/ANSI 372.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Provide in accordance with Division 01 General Requirements.

B. Packing, shipping, handling and unloading

1. Include manufacturer's certificate of conformance with each shipment.

2. Comply with manufacturer's recommendations for loading, unloading and storage.

3. Inspect upon delivery and reject materials not in conformance with specified requirements, or damaged during shipment, unloading or storage. Immediately remove damaged materials from Site and dispose of legally. Replace with new materials conforming to specified requirements.

1.08 SITE CONDITIONS

A. Existing conditions: per Division 01 General Requirements.

PART 2 – PRODUCTS

2.01 GENERAL

A. Products in contact with raw or drinking water must meet NSF/ANSI 61 and NSF/ANSI 372.

B. Materials provided shall be new, approved for use and purchased specifically for the Project.

2.02 GATE VALVES

A. Resilient wedge of non-rising stem (NSR) type meeting AWWA C515, with a 2-inch square AWWA operating nut opening LEFT (COUNTERCLOCKWISE). All cast ferrous components shall be ductile iron.

B. Underwriters Laboratories (UL) listed and Factory Mutual (FM) approved with smooth, oversized, unobstructed waterway.

C. Ductile iron valve body, bonnet, disc, stuffing box and operating nut.

D. Wedge: ductile iron, fully encapsulated EPDM rubber.

E. Stem and stem nut: silicon bronze.

F. Stem seals: triple O-rings, 2 above thrust collar, 1 below.

G. Stuffing box and bonnet sealing: nitrile O-rings.

H. Exterior nuts and bolts: Type 304 stainless steel with hexagonal head conforming to ANSI B18.21.

I. Minimum working pressure: 250 psi.

J. Standard mechanical joint ends in accordance with AWWA C111.

K. Interior and exterior ferrous surfaces of the valve body and bonnet shall be coated with fusion bonded epoxy coating in accordance with AWWA C550, and certified per NSF/ANSI 61 and NSF/ANSI 372.

L. Manufacturers

1. Mueller Corporation
2. U.S. Pipe Valve & Hydrant, LLC
3. Kennedy Valve Company
4. Or equal

2.03 VALVE BOXES

A. Heavy duty cast iron, two-piece slide type in accordance with ASTM A48. Telescoping, adjustable heavy-pattern type, inside diameter minimum 5-1/4 inches, designed to prevent transmission of traffic loads, adjustable through minimum 6 inches vertically without reduction of lap between sections to less than 4 inches, and length necessary to suit ground elevation. Covers: close fitting, dirt-tight, with WATER cast-in. Top of cover: flush with top of box rim. Made in USA.

2.04 HYDRANTS

A. Provide Mueller Super Centurion 250.

B. Dry barrel type in accordance with AWWA C502.

C. Hydrant with arrow and word OPEN cast into body or bonnet of hydrant to indicate turn direction.

D. Working pressure: 250 psi.

E. Provide with the following.

1. Traffic type at ground line
2. 5-1/2 foot bury
3. 6-inch mechanical joint shoe with fusion bonded epoxy coating
4. 5-1/4-inch valve opening, opening LEFT (COUNTERCLOCKWISE)
5. Two, 2-1/2 inch NST hose nozzles
6. One, 4-1/2 inch NST steamer nozzle
7. One, 1/2-inch operating nut - pentagon shape
8. 6-inch minimum inside barrel diameter
9. Factory coated epoxy primer and two-part polyurethane top coating in color selected by Owner.
10. Permanently mounted hydrant flag approved by Owner.

2.05 HYDRANT PAINT

A. Thoroughly clean hydrants and apply two (2) coats of epoxy paint for top coating either shop applied, or field applied in accordance with AWWA C502 and the paint manufacturer’s installation instructions. Verify paint colors with Owner prior to application.

B. Hydrants delivered with Owner's standard color shall receive one (1) field applied coat of matching alkyd gloss enamel, otherwise apply two (2) coats of matching alkyd gloss enamel.

C. Hydrant paint shall be manufactured by Sherwin William, Tnemec, Minnesota Mining and Manufacturing Co. (3M), or approved equal.

D. Alkyd gloss enamel shall be 801 DTM by Sherwin Williams, 2H-Tneme by Tnemec or approved equal.

2.06 PIPE BOLLARDS

A. Pipe bollards shall be concrete filled, ductile iron pipe with minimum 4-inch diameter. Concrete shall be minimum 3,000 psi, trowel rounded at the top. Provide bollards where shown on the Drawings, where directed by Owner or to replace existing bollards.

B. Provide a minimum 2 coats of field applied safety yellow epoxy paint.

2.07 THRUST RESTRAINT

A. Provide thrust restraint at valves and hydrants in accordance with Section 33 14 11.01.

2.08 TAPPING SLEEVES AND VALVES

A. Tapping Sleeve

1. ASTM A536 Grade 65-45-12 ductile iron rated for 250 psig maximum working pressure with end joint accessories and split glands to assemble sleeve to pipe.

2. Asphaltic varnish coating in accordance with NSF/ANSI 61.

3. Side flange seals: O-ring type, round, oval or rectangular in cross-sectional shape.

4. 12-inch and smaller: capable of working on Class ABCD pipe diameters without changing either half of sleeve.

5. 12-inch and greater: field measured to determine class required.

6. Outlet flange dimensions and drilling in compliance with ASME B16.1, class 125 and MSS SP-60.

7. Provide 3/4-inch national pipe thread (NPT) test plug.

B. Tapping Valve

1. Conform to Gate Valves requirements specified.

2. Provide with inlet flange conforming to ASME B16.1 Class 125 and MSS SP-60, and mechanical joint outlet end with dimensions complying with AWWA C111.

3. Designed to connect directly to flanged end of tapping sleeve.

2.09 SOURCE QUALITY CONTROL

A. Provide in accordance with Division 01 General Requirements.

PART 3 – EXECUTION

3.01 GENERAL

A. Perform excavation and backfill in accordance with Section 31 00 00.

B. Install in accordance with manufacturer's installation instructions, AWWA C600, as shown on Drawings, and as specified.

3.02 INSTALLATION

A. Valve and Valve Box

1. Provide that valves bear no stresses due to loads from adjacent pipe.

2. Inspect valves before installation, clean and lubricate prior to installation.

3. Install valve with stem in vertical position.

4. Secure valves to water main with retainer glands.

5. Set valve box over valve stem in vertical position. Brace valve box to ensure it remains in vertical position and centered on valve stem during and after backfilling.

6. Maintain proper alignment and height of valve box until final completion.

B. Hydrant

1. Provide hydrants have drains.

2. Restrain joints in hydrant lateral from main to hydrant.

3. Install hydrant gate on hydrant tee.

4. Set hydrant in true vertical alignment with solid concrete block support.

5. Embed hydrant within crushed stone material from bottom of excavation to 12 inches above hydrant drains. Cover crushed stone with plastic polyethylene sheet barrier.

6. Owner to inspect hydrant installation prior to backfilling.

7. Paint hydrant with rust inhibiting paint in color scheme selected by Owner.

C. Tapping Sleeve and Valve

1. After installation, pressure test joints before tapping.

2. Verify actual pipe size and material to be tapped.

3. Remove dirt and scale on exterior of water main to be tapped.

4. Clean and disinfect pipe exterior tapping saddle and valve, drilling and cutting tools.

5. Pipe shall be adequately supported such that machinery used to tap the main does not put undue stress on the pipe. Support of pipe may include construction of a concrete pad to distribute the load. Additional payment will not be made for construction of a concrete support pad.

3.03 THRUST RESTRAINT

A. Provide thrust restraint at valves, tees and hydrants in accordance with Section 33 14 11.01.

3.04 REPAIR/RESTORATION

A. Repair defective work and retest until installation is accepted.

B. Repair leaks and defective Work by cutting and removing defective section. Replace with new, specified materials. Connect replaced sections with solid sleeves. Pressure test, chlorinate, bacteria test and sample repaired section as directed by Owner.

C. Restore disturbed surface areas as follows.

1. Paved areas, including bituminous curbing and bituminous sidewalks: in accordance with Section 32 12 16.

2. Curbing: in accordance with Section 32 16 13.

3. Lawn areas: in accordance with Section 32 90 00.

D. Replace other materials and items removed, restore disturbed areas to original conditions.

E. Remove temporary erosion controls. Loam and seed grass areas damaged by erosion control installation in accordance with Section 32 90 00.

F. Restore staging areas to equal or better condition.

3.05 FIELD QUALITY CONTROL

A. Provide in accordance with Division 01 General Requirements.

3.06 CLOSEOUT ACTIVITIES

A. Provide in accordance with Division 01 General Requirements.

END OF SECTION

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SECTION 33 14 21

WATER SERVICE CONNECTIONS – COPPER

PART 1 – GENERAL

1.01 SUMMARY

A. Section Includes

1. Provide copper water service connections including service saddles, repair clamps, corporation stops, tubing, curb stops, service boxes and fittings in accordance with this Section and applicable reference standards listed in Article 1.03.

B. Related Requirements

1. Section 01 50 00 – Temporary Facilities and Controls
2. Section 01 51 38 – Temporary Water Bypass
3. Section 02 61 05 – Removal and Disposal of Contaminated Soil and Water
4. Section 31 00 00 – Earthwork
5. Section 32 12 16 – Asphalt Paving
6. Section 32 16 14 – Granite Curbs
7. Section 32 90 00 – Planting
8. Section 33 01 10.58 – Disinfection of Water Utility Piping Systems
9. Section 33 14 11.01 – Water Utility Piping – Ductile Iron

1.02 PRICE AND PAYMENT PROCEDURES

A. Measurement and payment requirements: per Division 01 General Requirements.

1.03 REFERENCES

A. Reference Standards

1. ASTM International (ASTM)

a. ASTM A48 Standard Specification for Gray Iron Castings

b. ASTM A240 Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications

c. ASTM A536 Standard Specification for Ductile Iron Castings

d. ASTM B62 Standard Specification for Composition Bronze or Ounce Metal Castings

e. ASTM B88 Standard Specification for Seamless Copper Water Tube

f. ASTM B584 Standard Specification for Copper Alloy Sand Castings for General Applications

g. ASTM D 2000 Standard Classification System for Rubber Products in Automotive Applications.

2. American Water Works Association (AWWA)

a. AWWA C230 Stainless-Steel Full-Encirclement Repair and Service Connection Clamps for 2 in. Through 12 in. Pipe

b. AWWA C600 Installation of Ductile-Iron Mains and Their Appurtenances

c. AWWA C651 Disinfection of Water Mains

d. AWWA C800 Underground Service Line Valves and Fittings

3. NSF International (NSF)

a. NSF/ANSI 61 Drinking Water System Components – Health Effects

b. NSF/ANSI 372 Drinking Water System Components – Lead Content

4. Uni-Bell PVC Pipe Association

a. Uni-Bell Tapping Guide for PVC Pressure Pipe

5. Unified Number System (UNS) for Copper and Copper Alloys

a. UNS C89520

b. UNS C89833

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordination, sequencing, and scheduling: per Division 01 General Requirements.

B. Complete utility service connections after disinfection, flushing and bacteriological testing of water utility piping systems have been accepted by the Owner.

1.05 SUBMITTALS

A. Submit in accordance with Division 01 General Requirements.

B. Product data: manufacturer's product data and installation instructions for each product specified.

C. Shop Drawings

D. Certificates:

1. Notarized manufacturer's certificate of conformance with the referenced Standards and requirements of the Specifications to accompany shipments.

2. NSF/ANSI 61 and NSF/ANSI 372 certificates of compliance and certified by NFS/ANSI accredited organization.

E. Closeout and maintenance material submittals: per Division 01 General Requirements.

1. Record depth and take ties (min. of 3) to corporation stop and curb box for conformed construction records. Provide ties for each service location to Owner in format acceptable to Owner.

1.06 QUALITY ASSURANCE

A. Provide in accordance with Division 01 General Requirements.

B. Comply with requirements of Owner’s Water and/or Public Works Departments and the requirements of AWWA C651 and AWWA C800.

C. Code Compliance: Comply with state and local plumbing codes. Apply more stringent code for any conflicts.

D. Products in contact with potable water must meet NSF/ANSI 61 and NSF/ANSI 372.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Provide in accordance with Division 01 General Requirements.

B. Packing, shipping, handling, and unloading

1. Each shipment to include manufacturers' certificate of conformance.

2. Inspect upon delivery and immediately reject products that do not conform to the specified requirements or has been damaged, immediately mark as to be removed, and remove from the Site.

C. Acceptance at Site

1. Inspect upon delivery and reject pipe not in conformance with specified requirements, or damaged beyond repair. Immediately remove damaged pipe from Site and dispose of legally.

D. Waste Management and Disposal

1. Remove and legally dispose of damaged materials and materials replaced by construction.

1.08 SITE CONDITIONS

A. Existing conditions: per Division 01 General Requirements.

PART 2 – PRODUCTS

2.01 GENERAL

A. Products in contact with drinking water must meet NSF/ANSI 61.

B. Materials provided shall be new, approved for use and purchased specifically for the Project.

2.02 SERVICE TUBING

A. Copper tubing: Type K, soft copper tubing in accordance with ASTM B88 and AWWA C800.

2.03 CORPORATION STOPS

A. Conform to AWWA C800, NSF/ANSI 61 and NSF/ANSI 372.

B. Materials:

1. Brass in contact with potable water shall be lead free with the letters "NL" or other manufacturer's standard lead free designation cast into the main body and shall conform to UNS Copper Alloy No. C89520 or C89833, in accordance with ASTM B584 and AWWA C-800.

2. Brass not in contact with potable water shall be 85-5-5-5 brass per UNS Copper Alloy C83600 in accordance with ASTM B62, ASTM B584 and AWWA C-800.

C. Type: ball type, solid, one-piece body with straight through, full port, blow-out proof design. Solid one-piece stem and operating head with 360° turning radius, 300 psig pressure rated ball type, brass ball coated with fluorocarbon coating, double O-ring type stem seals.

D. Inlet threads: AWWA CC threads in accordance with AWWA C800.

E. Outlet connection: compression outlet for copper tube size (CTS) outside diameter (OD) tubing.

F. Capable of being installed using a standard tapping machine.

G. Manufacturers

1. Mueller Corporation

2. Cambridge

3. Ford Meter Box Company, Inc.

4. Or equal

2.04 CURB STOPS

A. Conform to AWWA C800, NSF/ANSI 61 and NSF/ANSI 372.

B. Materials

1. Brass in contact with potable water shall be lead free with the letters “NL” or other manufacturer’s lead free designation cast into the main body and shall conform to UNS Copper Alloy No. C89520 and UNS C89833, in accordance with ASTM B584 and AWWA C800.

2. Brass not in contact with potable water shall be 85-5-5-5 per UNS Copper Alloy No. C83600 in accordance with ASTM B62, ASTM B584 and AWWA C-800.

C. Type: ball type, brass ball with fluorocarbon coating, double O-ring type stem seals, straight-through, full port design, compression inlet and outlet connections, positive shut-off in either direction with quarter turn check. Rated to 300 psig working pressure.

D. Manufacturers

1. Mueller Corporation

2. Cambridge

3. Ford Meter Box Company, Inc.

4. Or equal

2.05 SERVICE BOXES

A. Materials: ASTM A48 heavy duty cast iron.

B. Style: 2-1/2-inch Buffalo style.

C. Type: two-piece, slide type.

D. Cover: heavy duty, flush fit, locking type, brass pentagon head bolt, with word WATER cast-in.

E. Base: arch style, enlarged base for 1-1/2 inch and 2-inch diameter water services.

F. Made in USA.

2.06 SERVICE SADDLES

A. Conform to requirements of AWWA C800, NSF/ANSI 61 and NSF/ANSI 372.

B. ASTM A536 ductile iron body with Type 304 stainless steel per ASTM A240 dual straps, wraparound design with heavy tapping boss, standard AWWA thread per AWWA C800 (CC thread) and fusion bonded, epoxy coated in accordance with AWWA C213 or nylon coated per AWWA C224.

C. Gaskets: Buna-N (Nitrile) or EPDM, O-ring type rubber gaskets per ASTM D2000.

D. Studs, nuts and washers: Type 304 stainless steel. Nuts shall be coated to prevent galling.

E. Manufacturers

1. Smith-Blair, Inc.

2. Mueller Corporation

3. Ford Meter Box Company, Inc.

4. Or equal

2.07 REPAIR CLAMPS

A. Comply with AWWA C230, NSF/ANSI 61 and NSF/ANSI 372.

B. Materials: ASTM A240 Type 304 heavy gauge stainless steel band, mold bonded into the gasket to insure uniform compression against the pipe.

C. Gaskets: gridded Nitrile (Buna-N) or Styrene Butadiene Rubber (SBR) per ASTM D2000 gasket with tapered ends.

D. Lugs: ductile iron per ASTM A536, finish epoxy applied or 304 stainless steel per ASTM 240.

E. Pressure rating: maximum 150 psi working pressure.

F. Manufacturers

1. Romac Industries, Inc.

2. Ford Meter Box Company, Inc.

3. Smith-Blair, Inc.

4. Or equal

2.08 ACCESSORIES

A. Service Fittings

1. Materials: lead free with lead free designation cast into the main body and shall conform to UNS Copper Alloy No. C89520 or C89833 brass in accordance with ASTM B584 and AWWA C800.

2. Pressure rating: greater than valve or fitting of fitting used.

3. Inlet connection: compression type.

4. Outlet connection: compression type.

5. Manufacturers

a. Mueller Corporation

b. Cambridge

c. Ford Meter Box Company, Inc.

d. Or equal

2.09 SOURCE QUALITY CONTROL

A. Provide in accordance with Division 01 General Requirements.

PART 3 – EXECUTION

3.01 GENERAL

A. Coordinate all Work with Owner and Owner's representative.

B. Perform excavation and backfill in accordance with Section 31 00 00.

C. Install utility service connections in accordance with manufacturer's installation instructions, as shown on Drawings, and as specified. Provide after disinfection, flushing and bacteriological testing of water utility piping systems are complete and accepted by Owner.

D. Replace existing services 1-inch or smaller in diameter with new 1-inch diameter corporations, copper tubing and curb stops. Replace existing services greater than 1-inch and less than or equal to 2-inch in diameter with 2-inch service saddles, corporations, copper tubing and curb stops.

E. Provide service saddles for services installed on cast iron and PVC pipe and for services greater than 1-inch in diameter installed on ductile iron pipe.

3.02 INSTALLATION

A. Corporation Stops

1. Direct tap connections: Install direct tapped connections with tapping machine for services 1-inch in diameter and smaller in accordance with AWWA C600, manufacturer's instructions, and as shown on Drawings.

2. Service saddles: Install service saddles as required in Article 3.01, in accordance with manufacturer's instructions and as shown on the Drawings. Install service saddles for PVC/PVCO pipe in accordance with Uni-Bell Tapping Guide for PVC Pressure Pipe.

3. Install wet tap connections with tapping machine.

4. Install taps on customer side of water main.

5. Cut through water main wall completely when drilling. Clean tapped threads and remove any remnants of water main materials.

6. Wrap threaded end with Teflon tape prior to installation.

7. Ensure service taps are watertight.

B. Water Service Tubing

1. Extend as indicated on Drawings or directed by Owner.

2. Install in a single piece without joints between corporation and curb stop.

3. Install in a straight path from corporation stop to curb stop.

4. Avoid kinks, joints, gouges or crimps.

5. Install with a goose neck at the corporation stop, in accordance with the Drawings.

6. Connect to corporation stop, curb stop, and existing water service tubing.

7. Connect to existing water service with service fitting.

8. Install with minimum 5-feet of cover measured from top of service tubing to finished grade, as shown on Drawings, or approved in writing by Owner.

9. Provide sand bedding and cover in accordance with the Drawings.

10. Insulate service tubing with less than 5 feet of cover with minimum 4-inch, 40-pound density styrofoam material. Extend insulation the width of the trench, minimum 4-feet above pipe envelope and on vertical sides of trench bottom, from bottom to above pipe envelope. Do not install water service tubing with less than 5 feet of cover without approval from Owner.

11. Remove and legally dispose of existing water service tubing and appurtenances.

C. Curb Stop and Box

1. Install in trench on precast solid concrete block support at elevation to provide minimum cover of 5-feet.

2. Perform operational testing of curb stops by opening and closing under water pressure to ensure proper operation and release any air in the water service tubing.

3. Pressure test utility service connections under active line pressure in the presence of the Owner or Owner’s representative. Do not backfill until approved by Owner or Owner’s representative.

4. Provide a service box for each curb stop.

5. Set and brace curb box to ensure it remains in a vertical position centered on the curb stop during and after backfilling. Maintain proper alignment and height of curb box until completion of Project.

6. Install curb box so cover is flush with existing grade.

7. Remove and legally dispose of existing curb stop and box.

3.03 REPAIR/RESTORATION

A. Repair defective service taps with stainless steel split sleeve repair clamps.

B. Install repair clamps in accordance with AWWA C230. Do not re-tap water main within 12 inches of repair clamp.

C. Replace defective water service tubing with a single piece of tubing extending from corporation stop to curb stop.

D. Repair defective Work and retest until installation is accepted.

E. Repair leaks.

F. Repair user indoor plumbing problems that occur as a result of Work performed at no cost to the Owner.

G. Restore disturbed surface areas as follows.

1. Paved areas, including bituminous curbing and bituminous sidewalks in accordance with Section 32 12 16.

2. Granite curbing in accordance with Section 32 16 14

3. Lawn areas in accordance with Section 32 90 00.

H. Replace other materials and items removed, restore disturbed areas to original conditions.

3.04 FIELD QUALITY CONTROL

A. Provide in accordance with Division 01 General Requirements.

3.05 CLEANING

A. Clean and flush piping after Work is completed, before final acceptance.

3.06 CLOSEOUT ACTIVITIES

A. Provide in accordance with Division 01 General Requirements.

END OF SECTION

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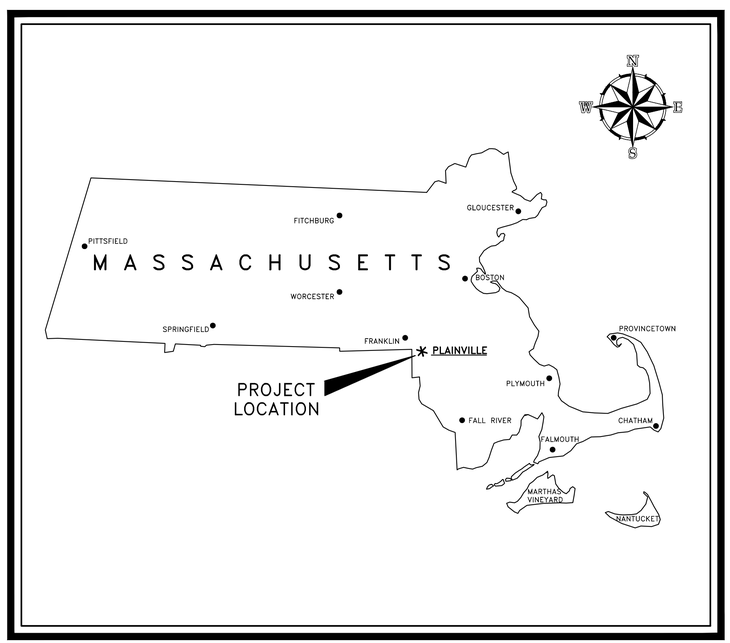
COMMITMENT & INTEGRITY DRIVE RESULTS

TOWN OF PLAINVILLE, MASSACHUSETTS
DEPARTMENT OF PUBLIC WORKS

GROVE STREET & PLEASANT STREET
WATER MAIN IMPROVEMENTS

CONFORMED CONTRACT DOCUMENTS FOR CONSTRUCTION



PROJECT LOCATION MAP

50 0 50 100
scale mile

PROJECT NO. 233560.00

MARCH 2022

COMMONWEALTH OF MASSACHUSETTS
ARTHUR D. LEVENTIS
CIVIL
No. 45470
REGISTERED PROFESSIONAL ENGINEER

WOODARD & CURRAN
40 SHATTUCK ROAD, SUITE 110
ANDOVER, MASSACHUSETTS 01810
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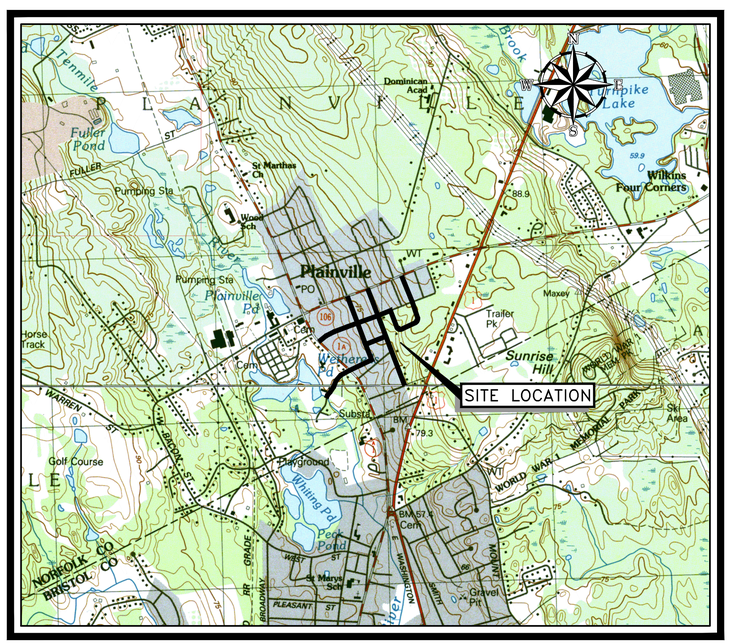
COMMITMENT & INTEGRITY DRIVE RESULTS



SOURCE: USGS

SITE LOCATION MAP

NOT TO SCALE

\\woodardcurran.net\shared\Projects\233560.00 Plainville MA Grove St Pleasant St Water Main\Project Record\Deliverables\Conformed Set\Drawings\General\233560.00_COVER.dwg, Mar 09, 2022 - 11:42am

GENERAL NOTES

1. PROVIDE ALL MATERIALS AND LABOR AS REQUIRED TO PERFORM THE WORK INDICATED ON THE DRAWINGS AND IN THE SPECIFICATIONS. ALL WORK TO BE COMPLETED IN ACCORDANCE WITH APPLICABLE FEDERAL, STATE, AND LOCAL CODES.
2. THE LOCATION, TYPE AND SIZE OF EXISTING PIPES, DUCTS, CONDUITS, UTILITIES AND UNDERGROUND STRUCTURES SHOWN ON THE DRAWINGS ARE NOT WARRANTED TO BE EXACT, NOR IS IT WARRANTED THAT ALL UNDERGROUND STRUCTURES ARE SHOWN. CONTRACTOR SHALL FIELD VERIFY ALL LOCATIONS, SIZES AND DEPTHS.
3. COORDINATE CONSTRUCTION ACTIVITIES WITH THE TOWN OF PLAINVILLE WATER AND SEWER DEPARTMENT, PLAINVILLE POLICE DEPARTMENT, PLAINVILLE FIRE DEPARTMENT, UTILITY COMPANIES, AND THE ENGINEER.
4. RESTORE ALL AREAS DISTURBED BY CONTRACTOR'S OPERATIONS TO ORIGINAL OR BETTER CONDITION UNLESS NOTED OTHERWISE (GRAVEL, CONCRETE, PAVEMENT, GRASS, ETC.).
5. ALL NEW BURIED PIPE SHALL HAVE MINIMUM 5 FEET OF COVER UNLESS NOTED OTHERWISE OR APPROVED BY THE ENGINEER. BURIED PIPE WITH LESS THAN 4 FEET OF COVER SHALL HAVE A MINIMUM OF 4 INCHES OF RIGID INSULATION WITH AN R-VALUE OF R-20 INSTALLED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
6. PROTECT PROPERTY IRONS AND PROPERTY MONUMENTS FROM DAMAGE. IF DISTURBED, THE PROPERTY IRON OR PROPERTY MONUMENT WILL BE RESET BY A REGISTERED LAND SURVEYOR APPROVED BY THE OWNER, AT THE CONTRACTOR'S EXPENSE.
7. TAKE ALL NECESSARY PRECAUTIONS TO PREVENT EQUIPMENT FLUIDS FROM REACHING ANY WATER RESOURCE AREA. FLUID DISCHARGED INADVERTENTLY SHALL BE IMMEDIATELY CLEANED IN ACCORDANCE WITH LOCAL, STATE AND FEDERAL REGULATIONS, AS DETERMINED BY A LICENSED SITE PROFESSIONAL APPROVED BY THE OWNER.
8. SUPPORT ALL PIPING AS SPECIFIED ON SECTION 31 50 00 INCLUDING SMALL DIAMETER PIPE, TUBING AND CONDUIT.
9. LOCATION OF EXISTING UTILITIES, BUILDINGS, AND EQUIPMENT LAYOUTS ARE BASED ON BEST INFORMATION AVAILABLE. INFORMATION INCLUDES PLANS PROVIDED BY OWNER AND UTILITY COMPANIES. TOPOGRAPHIC GROUND CONTROL AND UTILITY SURVEY INFORMATION PROVIDED BY SITEC, INC., FEBRUARY 2021. CONTRACTOR SHALL VERIFY THE LOCATION OF EXISTING UTILITIES PRIOR TO START OF CONSTRUCTION.
10. VERIFY ALL DIMENSIONS AND ELEVATIONS PRIOR TO START OF CONSTRUCTION.
11. CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE TO STRUCTURES, UTILITIES, AND EQUIPMENT NOT SCHEDULED FOR REMOVAL.
12. PROVIDE A DETAILED CONSTRUCTION SCHEDULE TO THE OWNER FOR REVIEW AND APPROVAL AT LEAST 14 CALENDAR DAYS PRIOR TO BEGINNING CONSTRUCTION.
13. EXISTING FACILITIES (I.E. FENCES, GUARDRAILS, TREES, POLES, SIGNS, LIGHT POLES, MAIL BOXES, ETC.) SHALL BE REMOVED AND REPLACED IN KIND, IN ACCORDANCE WITH LOCAL AND STATE REQUIREMENTS, OR PROTECTED AS REQUIRED DURING CONSTRUCTION. THE ASSOCIATED COSTS SHALL BE CONSIDERED INCIDENTAL TO THE PROJECT.
14. PROVIDE TRAFFIC CONTROL DEVICES IN ACCORDANCE WITH SPECIFICATIONS, AND LOCAL REQUIREMENTS. MAINTAIN CONTINUOUS TRAFFIC FLOW (MINIMUM OF ONE LANE EACH DIRECTION) DURING CONSTRUCTION. THE ASSOCIATED COSTS SHALL BE CONSIDERED INCIDENTAL TO THE PROJECT.
15. ALL CURB DAMAGED DURING CONSTRUCTION SHALL BE REPLACED IN KIND AND SHALL CONFORM TO MASSDOT SPECIFICATIONS, UNLESS OTHERWISE SPECIFIED IN THE CONTRACT DOCUMENTS.
16. COMPACT TRENCHES IN ACCORDANCE WITH REQUIREMENTS OF SECTION 31 00 00 OF THE SPECIFICATIONS.
17. APPLY AND PAY FOR LOCAL AND STATE PERMITS NECESSARY TO COMPLETE THE WORK. ALL ASSOCIATED COSTS SHALL BE INCIDENTAL TO THE MOBILIZATION ITEM IN THE BID FORM.
18. WHERE NEW WATER MAINS OR APPURTENANCES ARE TO BE CONNECTED TO EXISTING PIPE, CUT AND REMOVE THE EXISTING PIPE AS SPECIFIED TO INSTALL THE NEW WORK. TEST PIT LOCATIONS WHERE NEW MAINS CONNECT TO EXISTING MAINS TO VERIFY PIPE DIAMETER AND MATERIAL TYPE PRIOR TO BEGINNING WORK.
19. WHERE CUT-IN OF VALVES AND/OR HYDRANTS ARE SHOWN, PROVIDE CLDI FITTINGS AND THRUST RESTRAINT AS REQUIRED TO CUT-IN VALVES AND HYDRANTS. CUT-IN WORK IS INTENDED TO PROVIDE ISOLATION CONTROL AND TEMPORARY BYPASS FEEDS. TEMPORARY CONNECTIONS AND THRUST RESTRAINT ARE CONSIDERED INCIDENTAL TO THE WORK AND WILL NOT BE CONSIDERED FOR PAYMENT.
20. INSTALL 2-INCH AND 4-INCH TEMPORARY BYPASS SYSTEM AS SHOWN ON CONSTRUCTION DRAWINGS, OR AS SUBMITTED AND APPROVED BY OWNER. NO REDUCTION IN BYPASS PIPE DIAMETER SHALL BE PERMITTED.
21. CONFIRM FINAL LOCATIONS FOR NEW WATER MAINS, HYDRANTS, VALVES AND FITTINGS IN THE FIELD WITH THE OWNER PRIOR TO SAW CUTTING PAVEMENT.
22. SOLID SLEEVES ARE SHOWN ON THE DRAWINGS FOR ALL CONNECTIONS TO EXISTING WATER MAIN. WHERE OUTER DIAMETER OF EXISTING WATER MAIN IS FOUND TO BE GREATER THAN THE MAXIMUM OUTER DIAMETER COMPATIBLE WITH SOLID SLEEVES, PROVIDE A COUPLING TO COMPLETE CONNECTION WITH EXISTING WATER MAIN.
23. PLUG ENDS OF WATER MAINS TO BE ABANDONED IN PLACE WITH HYDRAULIC CEMENT OR MECHANICAL JOINT FITTINGS. SEAL SHALL BE WATER-TIGHT. ALL COSTS ASSOCIATED WITH ABANDONING EXISTING WATER MAIN IN PLACE SHALL BE CONSIDERED INCIDENTAL TO THE PROJECT.
24. NOTIFY THE WATER AND SEWER DEPARTMENT AND UTILITY COMPANIES PRIOR TO COMMENCING WORK TO ALLOW SUFFICIENT TIME TO LOCATE AND MARK THE LOCATION OF ALL BURIED UTILITIES. CONTRACTOR SHALL ALSO CONTACT "DIG SAFE", TELEPHONE NO. 888-344-7233, AT LEAST 72 HOURS PRIOR TO CONSTRUCTION. REPAIR OF ANY DAMAGED UTILITY WILL BE INCIDENTAL TO THE CONTRACT.
25. BRACING OF UTILITY POLES, WHERE REQUIRED, SHALL BE INCIDENTAL TO THE INSTALLATION OF THE WORK, NO SEPARATE PAYMENT SHALL BE MADE.
26. EXCAVATE TEST PITS TO DETERMINE LOCATION, PIPE DIAMETER (O.D.), AND PIPE MATERIAL FOR EXISTING UTILITIES, WHEN REQUESTED.
27. DO NOT STORE TOOLS, VEHICLES, MATERIALS, SUPPLIES, OR EQUIPMENT ON DRAINAGE STRUCTURES OR WITHIN 100 FEET OF WETLANDS OR RESOURCE AREAS.
28. THE CONTRACTOR IS RESPONSIBLE TO PROVIDE WRITTEN NOTIFICATION TO ANY PROPERTY THAT WILL BE WITHOUT WATER DUE TO A SCHEDULED SHUTDOWN. CONTRACTOR SHALL DELIVER WRITTEN NOTIFICATION TO EACH PROPERTY AT LEAST 72 HOURS IN ADVANCE OF SCHEDULED SHUTDOWN. PROVIDE DRAFT OF NOTIFICATION TO THE WATER AND SEWER DEPARTMENT FOR REVIEW AND APPROVAL PRIOR TO DISTRIBUTING NOTIFICATION TO PROPERTIES.
29. SAWCUT ALL DRIVEWAYS, WALKWAYS, AND SIDEWALKS AT EDGE OF RIGHT OF WAY TO TRANSITION EXISTING GRADE TO FINISH GRADE.
30. RESTORE SIDEWALKS DAMAGED BY THE WORK IN-KIND WITH RESPECT TO WIDTH AND MATERIALS. MATCH EXISTING GRADES. CONSTRUCT SIDEWALK REPAIRS IN ACCORDANCE WITH THE SPECIFICATIONS SET FORTH IN THE COMMONWEALTH OF MASSACHUSETTS EXECUTIVE OFFICE OF PUBLIC SAFETY, AAB, "RULES AND REGULATIONS" WHICH APPEAR IN THE CODE OF MA REG (C) 521 CMR 1.00.
31. EROSION AND SEDIMENTATION CONTROLS SHALL BE PROVIDED IN COMPLIANCE WITH THE MOST RECENT EDITION OF MASSACHUSETTS EROSION AND SEDIMENT CONTROL GUIDELINES FOR URBAN AND SUBURBAN AREAS AS PUBLISHED BY THE MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION BUREAU OF RESOURCE PROTECTION.
32. CATCH BASIN SEDIMENT CONTROL DEVICES SHALL BE INSTALLED IN ALL CATCH BASINS ON THE PROJECT SITE. USE A HIGH-FLOW SILTSACK OR APPROVED EQUIVALENT IN ALL CATCH BASINS TO CONTROL SEDIMENT AND COMPLY WITH DIV. 01 GENERAL GENERAL REQUIREMENTS. REMOVE COLLECTED SEDIMENT AS NECESSARY TO MAINTAIN PROPER DRAINAGE. AT A MINIMUM, REPLACE SEDIMENT CONTROL DEVICES MONTHLY.
33. SERVICE LOCATIONS ARE UNKNOWN AND SHALL NOT BE MARKED BY THE WATER AND SEWER DEPARTMENT. TEST PIT TO LOCATE SERVICES WHERE NECESSARY.
34. THE CONTRACTOR SHALL NOT OPERATE EXISTING VALVES OR HYDRANTS IN THE DISTRIBUTION SYSTEM.
35. THE WATER AND SEWER DEPARTMENT WILL OPERATE EXISTING VALVES AND HYDRANTS TO ISOLATE SECTIONS OF THE WORK. PROVIDE A MINIMUM 72-HOUR ADVANCE NOTICE TO THE WATER AND SEWER DEPARTMENT WHEN REQUESTING OPERATION OF EXISTING VALVES AND HYDRANTS.
36. LEAD SERVICES ENCOUNTERED SHALL BE REPLACED TO THE METER, WHERE DIRECTED BY OWNER.

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GENERAL	
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C-102	GROVE STREET – 1, MELCHER STREET, PLEASANT STREET – 1, LINCOLN AVENUE – 1
C-103	LINCOLN AVENUE – 2
C-104	GROVE STREET – 2, PLEASANT STREET – 2
C-105	PLEASANT STREET – 3, WITHERELL PLACE
DETAILS	
C-501	WATER MAIN DETAILS – 1
C-502	WATER MAIN DETAILS – 2
C-503	WATER MAIN DETAILS – 3

ABBREVIATIONS

@	AT
ADJ.	ADJUSTABLE
ALUM.	ALUMINUM
APA	AMERICAN PLYWOOD ASSOCIATION
APPROX.	APPROXIMATE
ASS'Y	ASSEMBLY
ASTM	AMERICAN SOCIETY OF TESTING MATERIALS
B	BEAM
B	BORING
BLDG.	BUILDING
BOT	BOTTOM
BV	BUTTERFLY VALVE
C	COLUMN
C.E.	CONTINUOUS END
CB	CATCH BASIN
CDF	CONTROLLED DENSITY FILL
CJ	CONTROL JOINT
CLDI	CEMENT-LINED DUCTILE IRON
CLR.	CLEAR
CLF	CHAIN LINK FENCE
CMP	CORRUGATED METAL PIPE
CMU	CONCRETE MASONRY UNIT
COL.	COLUMN
CONC.	CONCRETE
CONT.	CONTINUOUS
COR	CORNER
CORR.	CORRUGATED
CPE	CORRUGATED POLYETHYLENE
CU	COPPER
D	DIAMETER
D.E.	DISCONTINUOUS END
D.I.	DUCTILE IRON
DES.	DESIGNED
DIA.	DIAMETER
DIAG.	DIAGONALLY
DISCONT.	DISCONTINUOUS
DR.	DRAWN
DRI	DOUBLE RING INFILTROMETER
DRWGS.	DRAWINGS
E	EASTING
EA.	EACH
EFFL.	EFFLUENT
EL.	ELEVATION
ELECT.	ELECTRICAL
ELEV.	ELEVATION
EMBED.	EMBEDDMENT
EQ.	EQUALIZATION
EXP.	EXPANSION
F	FOOTING
FD	FLOOR DRAIN
FF	FINISH FLOOR
FIN	FINISH
FIN. FLR.	FINISH FLOOR
FL.	FLANGE
FM	FORCE MAIN
FRP	FIBERGLASS REINFORCED PLASTIC
FT.	FOOT
FTG.	FOOTING
FTG.	FITTING
G	GAS
GALV.	GALVANIZED
GV	GATE VALVE
H	HATCH
H	HEIGHT
HOR.	HORIZONTAL
HORIZ.	HORIZONTAL
HP	HIGH POINT
HVAC	HEATING, VENTILATING AND AIR CONDITIONING
IMFO	INTEGRALLY MOLDED FLANGED OPENING
INV.	INVERT
L	LENGTH
L.L.V.	LONG LEG VERTICAL
LB	POUND
LG.	LONG
LP	LOW POINT
M.O.	MASONRY OPENING
MAX.	MAXIMUM
MECH.	MECHANICAL
MH	MANHOLE
MIN.	MINIMUM
MPH	MILES PER HOUR
MR	MONORAIL
MW	MONITORING WELL
N	NORTHING
NIC	NOT IN CONTRACT
N.T.S.	NOT TO SCALE
#	NUMBER
NO.	NUMBER
NOM.	NOMINAL
O.C.	ON CENTER
O.C.E.F.	ON CENTER EACH FACE
O.C.E.W.	ON CENTER EACH WAY
O.D.	OUTSIDE DIAMETER
O.I.T.	OPERATOR INTERFACE TERMINAL
OZ.	OUNCE
P	PLATE
PL	PROPERTY LINE
PC	POINT OF CURVATURE
PCC	POINT OF COMPOUND CURVE
PCF	PER CUBIC FOOT
PE	POLYETHYLENE
PIC	POST INDICATOR VALVE
PRC	POINT OF REVERSE CURVE
PSI	PER SQUARE INCH
PT	POINT OF TANGENCY
PVC	POLYVINYL CHLORIDE
PZ	PIEZOMETER
RCP	REINFORCED CONCRETE PIPE
REINF.	REINFORCEMENT
RIBS	RAPID INFILTRATION BASINS
S	SEWER
S	SLOPE
S.S.	STAINLESS STEEL
SCH.	SCHEDULE
SECT	SECTION
SHLDR.	SHOULDER
SHT.	SHEET
SP. AL.	SPECIAL ALUMINUM
SQ.	SQUARE
SUP.	SUPPORT
TEMP.	TEMPERATURE
THD.	THREADED
TMB	TEMPORARY BENCH MARK
TOC	TOP OF CONCRETE
TP	TEST PIT
TYP.	TYPICAL
U.N.O.	UNLESS NOTED OTHERWISE
UGE	UNDERGROUND ELECTRIC
UGT	UNDERGROUND TELEPHONE
UV	ULTRAVIOLET
V	VELOCITY
VERT.	VERTICAL
W	WATER
W	WIDE
W/	WITH
YR.	YEAR

CIVIL SYMBOLS

DESCRIPTION	EXISTING	PROPOSED
SANITARY SEWER MANHOLE	○	●
SANITARY SEWER SERVICE CLEANOUT	○CO	○CO
STORM DRAIN MANHOLE	○	●
CATCH BASIN	▤	▤
TELECOMM MANHOLE	○	●
TELECOMM SERVICE BOX	T	
ELECTRIC MANHOLE	○	●
TRANSFORMER	⊠	⊠
UTILITY POLE W/GUY		
UTILITY POLE		
LIGHTPOST		
GAS METER BOX	G	G
GAS VENT		
GAS GATE	⊗	⊗
REDUCER		▲
WATER VALVE	⊗	⋈
CLOSED WATER VALVE	⊗CV	⋈
CURB STOP	⊗	●
HYDRANT		
WATER WELL	W	W
WATER METER BOX	W	W
SIGN		
MAILBOX	∞	
FLAGPOLE	FP	
WETLAND HATCHING		
CONIFEROUS TREE		
DECIDUOUS TREE		
STONE CHECK DAM	SCD	SCD
SURVEY STATION	△	
TEMPORARY BENCH MARK		
IRON PIN	IPF	IPS
MONUMENTS	MF	MS
SPOT ELEVATION	XXX.XX +	XXX.XX +
TEST PIT & NUMBER	TP-X	
BORING WITH SAMPLING & NUMBER	B-X	B-P
BORING WITHOUT SAMPLING & NUMBER	B-X	B-P
SURFACE WATER MONITORING LOC.		
MONITORING WELL	MW-X	MW-P
PIEZOMETER	P-X	P-P
TEMPORARY HYDRANT		
TEMPORARY GATE VALVE		⋈
TAP HOLE		●

EXISTING LINETYPES

CONTOUR (1' OR 2' INTERVAL) — 122 —
SANITARY SEWER — S —
FORCE MAIN — FM —
STORM DRAIN — SD —
DRAIN — D —
WATER MAIN — W —
UNDERGROUND ELECTRIC — E —
UNDERGROUND TELEPHONE — T —
UNDERGROUND TELEVISION — TV —
GAS LINE — G —
OVERHEAD ELECTRIC — OE —

CULVERT
INV. IN. EL. XXX.XX
INV. OUT EL. XXX.XX

PROPERTY LINE — P —
RIGHT OF WAY — R/W —
EASEMENT
EDGE OF VEGETATION
FENCE
CENTERLINE — ℄ —
RETAINING WALL
STONEWALL
CURB
EDGE OF PAVEMENT
EDGE OF GRAVEL
GUARDRAIL
RAILROAD TRACKS
DRAINAGE DITCH / SWALE
EXTENT OF WETLANDS
RIVERFRONT 25FT BUFFER — RIVERFRONT —
TOP OF BANK — TOP OF BANK —
WETLAND 100FT BUFFER — BUFFER —
LIMITS OF FLOOD ZONE — FLOOD —

PROPOSED LINETYPES

CONTOUR (1' OR 2' INTERVAL) — 122 —
CONTOUR (INDEX) — 120 —
SANITARY SEWER — S —
FORCE MAIN — FM —
STORM DRAIN — SD —
DRAIN — D —
WATER MAIN
TEMPORARY WATER MAIN
UNDERGROUND ELECTRIC — E —
UNDERGROUND TELEPHONE — T —
UNDERGROUND TELEVISION — TV —
GAS LINE — G —
OVERHEAD ELECTRIC — OE —

CULVERT
INV. IN. EL. XXX.XX
INV. OUT EL. XXX.XX

HOUSE SERVICE / LATERAL
PROPERTY LINE — P —
RIGHT OF WAY — R/W —
EASEMENT
EDGE OF VEGETATION
FENCE
CENTERLINE — ℄ —
RETAINING WALL
STONEWALL
CURB
EDGE OF PAVEMENT
EDGE OF GRAVEL
GUARDRAIL
DRAINAGE DITCH / SWALE
SILT FENCE AND STRAW WATTLES

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COMMONWEALTH OF MASSACHUSETTS
ARTHUR D. LEVENTIS
No. 36540
REGISTERED PROFESSIONAL ENGINEER

REV	DESCRIPTION	DATE
DESIGNED BY: EVR	CHECKED BY: AJL	
DRAWN BY: EVR	233560.00_G-100.dwg	

GENERAL NOTES, LEGEND AND ABBREVIATIONS

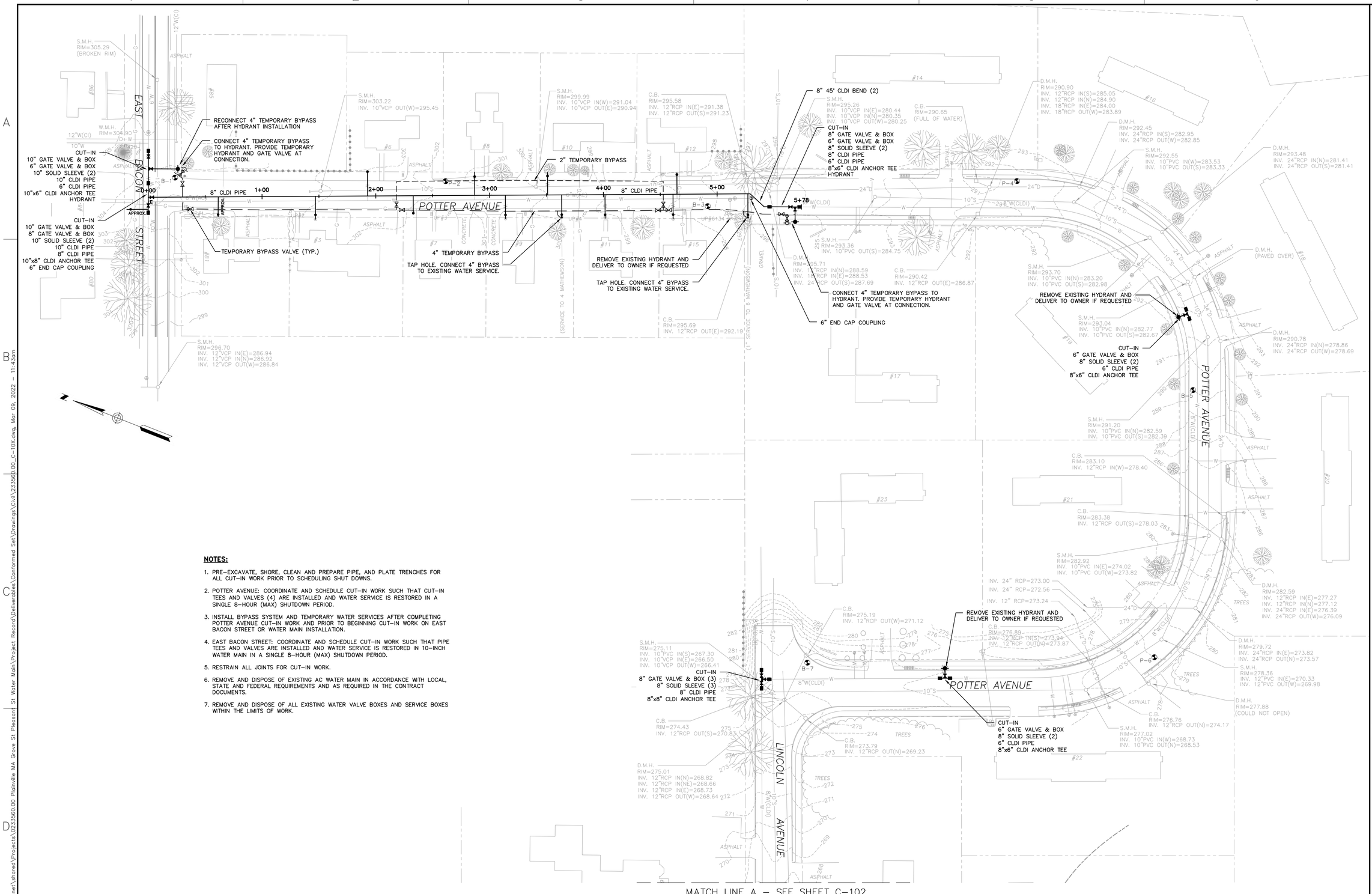
TOWN OF PLAINVILLE, MASSACHUSETTS
DEPARTMENT OF PUBLIC WORKS

GROVE STREET & PLEASANT STREET WATER MAIN IMPROVEMENTS

JOB NO.: 233560.00
DATE: MARCH 2022
SCALE: NONE
SHEET: 2 OF 10

G-100

\\woodardcurran.net\shared\Projects\233560.00 Plainville MA Grove St Pleasant St Water Main\Project Record\Deliverables\Conformed Set\Drawings\General\233560.00_G-100.dwg, Mar 09, 2022 - 11:43am



NOTES:

1. PRE–EXCAVATE, SHORE, CLEAN AND PREPARE PIPE, AND PLATE TRENCHES FOR ALL CUT–IN WORK PRIOR TO SCHEDULING SHUT DOWNS.
2. POTTER AVENUE: COORDINATE AND SCHEDULE CUT–IN WORK SUCH THAT CUT–IN TEES AND VALVES (4) ARE INSTALLED AND WATER SERVICE IS RESTORED IN A SINGLE 8–HOUR (MAX) SHUTDOWN PERIOD.
3. INSTALL BYPASS SYSTEM AND TEMPORARY WATER SERVICES AFTER COMPLETING POTTER AVENUE CUT–IN WORK AND PRIOR TO BEGINNING CUT–IN WORK ON EAST BACON STREET OR WATER MAIN INSTALLATION.
4. EAST BACON STREET: COORDINATE AND SCHEDULE CUT–IN WORK SUCH THAT PIPE TEES AND VALVES ARE INSTALLED AND WATER SERVICE IS RESTORED IN 10–INCH WATER MAIN IN A SINGLE 8–HOUR (MAX) SHUTDOWN PERIOD.
5. RESTRAIN ALL JOINTS FOR CUT–IN WORK.
6. REMOVE AND DISPOSE OF EXISTING AC WATER MAIN IN ACCORDANCE WITH LOCAL, STATE AND FEDERAL REQUIREMENTS AND AS REQUIRED IN THE CONTRACT DOCUMENTS.
7. REMOVE AND DISPOSE OF ALL EXISTING WATER VALVE BOXES AND SERVICE BOXES WITHIN THE LIMITS OF WORK.

MATCH LINE A – SEE SHEET C–102

40' 0 40' 80'

BAR SCALE
1" = 40'
CHECK GRAPHIC SCALE BEFORE USING

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COMMONWEALTH OF MASSACHUSETTS
ARTHUR D. LEVENTIS
No. 36540
REGISTERED PROFESSIONAL ENGINEER
PROFESSIONAL ENGINEER

REV	DESCRIPTION	DATE
DESIGNED BY: EVR	CHECKED BY: AJL	
DRAWN BY: EVR	233560.00_C–10X.dwg	

POTTER AVENUE

TOWN OF PLAINVILLE, MASSACHUSETTS
DEPARTMENT OF PUBLIC WORKS

GROVE STREET & PLEASANT STREET WATER MAIN IMPROVEMENTS

JOB NO.: 233560.00
DATE: MARCH 2022
SCALE: 1"=40'
SHEET: 3 OF 10

C-101

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MATCH LINE A – SEE SHEET C-101

MATCH LINE B – SEE SHEET C-103

MATCH LINE C – SEE SHEET C-104

NOTES:

1. INSTALL BYPASS SYSTEM AND TEMPORARY WATER SERVICES PRIOR TO BEGINNING CUT-IN WORK OR WATER MAIN INSTALLATION.
2. PRE-EXCAVATE TRENCHES FOR CUT-IN WORK AND PLATE TRENCHES. CUT-IN WORK SHALL BE COMPLETED IN SINGLE, 8-HOUR (MAX) SHUTDOWN PERIOD.
3. INSTALL CUT-IN WORK PRIOR TO BEGINNING MAINLINE WORK.
4. REMOVE AND DISPOSE OF ALL EXISTING WATER VALVE BOXES AND SERVICE BOXES WITHIN THE LIMITS OF WORK.

BAR SCALE
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ARTHUR D. LEVENTIS
No. 36540
REGISTERED PROFESSIONAL ENGINEER

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TOWN OF PLAINVILLE, MASSACHUSETTS
DEPARTMENT OF PUBLIC WORKS

GROVE STREET & PLEASANT STREET WATER MAIN IMPROVEMENTS

GROVE STREET - 1,
MELCHER STREET,
PLEASANT STREET - 1,
LINCOLN AVENUE - 1

JOB NO.:	233560.00
DATE:	MARCH 2022
SCALE:	1"=40'
SHEET:	4 OF 10

C-102

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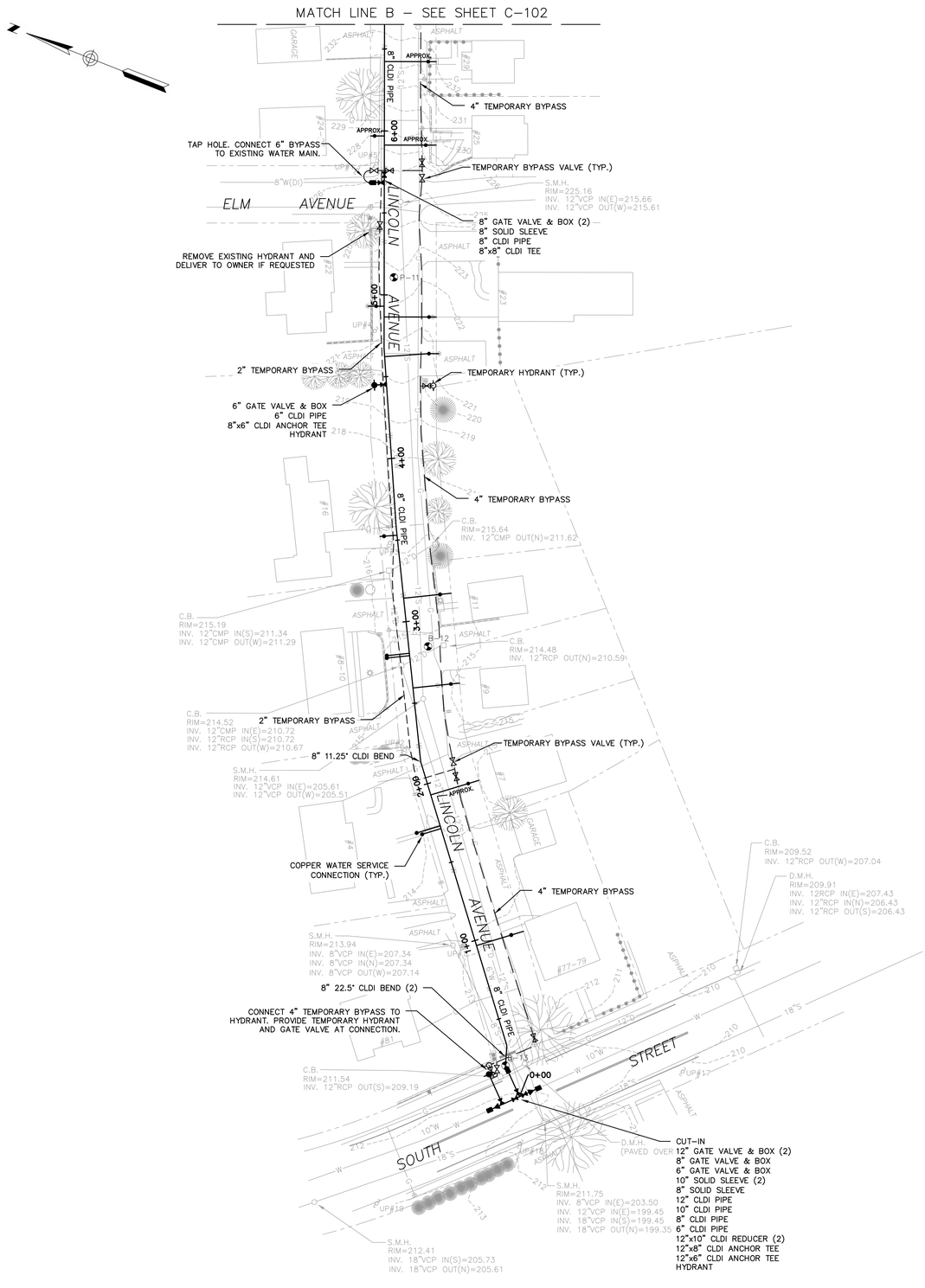

NOTES:

1. INSTALL BYPASS SYSTEM AND TEMPORARY WATER SERVICES PRIOR TO BEGINNING CUT-IN WORK OR WATER MAIN INSTALLATION.
2. PRE-EXCAVATE TRENCHES FOR CUT-IN WORK AND PLATE TRENCHES. CUT-IN WORK SHALL BE COMPLETED IN THE SAME 8-HOUR (MAX) SHUT DOWN.
3. INSTALL CUT-IN WORK PRIOR TO BEGINNING MAINLINE WORK.
4. REMOVE AND DISPOSE OF ALL EXISTING GATE BOXES WITHIN THE LIMITS OF WORK.

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ARTHUR D. LEVENTIS
No. 34540
REGISTERED PROFESSIONAL ENGINEER

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LINCOLN AVENUE - 2

TOWN OF PLAINVILLE, MASSACHUSETTS
DEPARTMENT OF PUBLIC WORKS

GROVE STREET & PLEASANT STREET WATER MAIN IMPROVEMENTS

JOB NO.: 233560.00
DATE: MARCH 2022
SCALE: 1"=40'
SHEET: 5 OF 10

C-103

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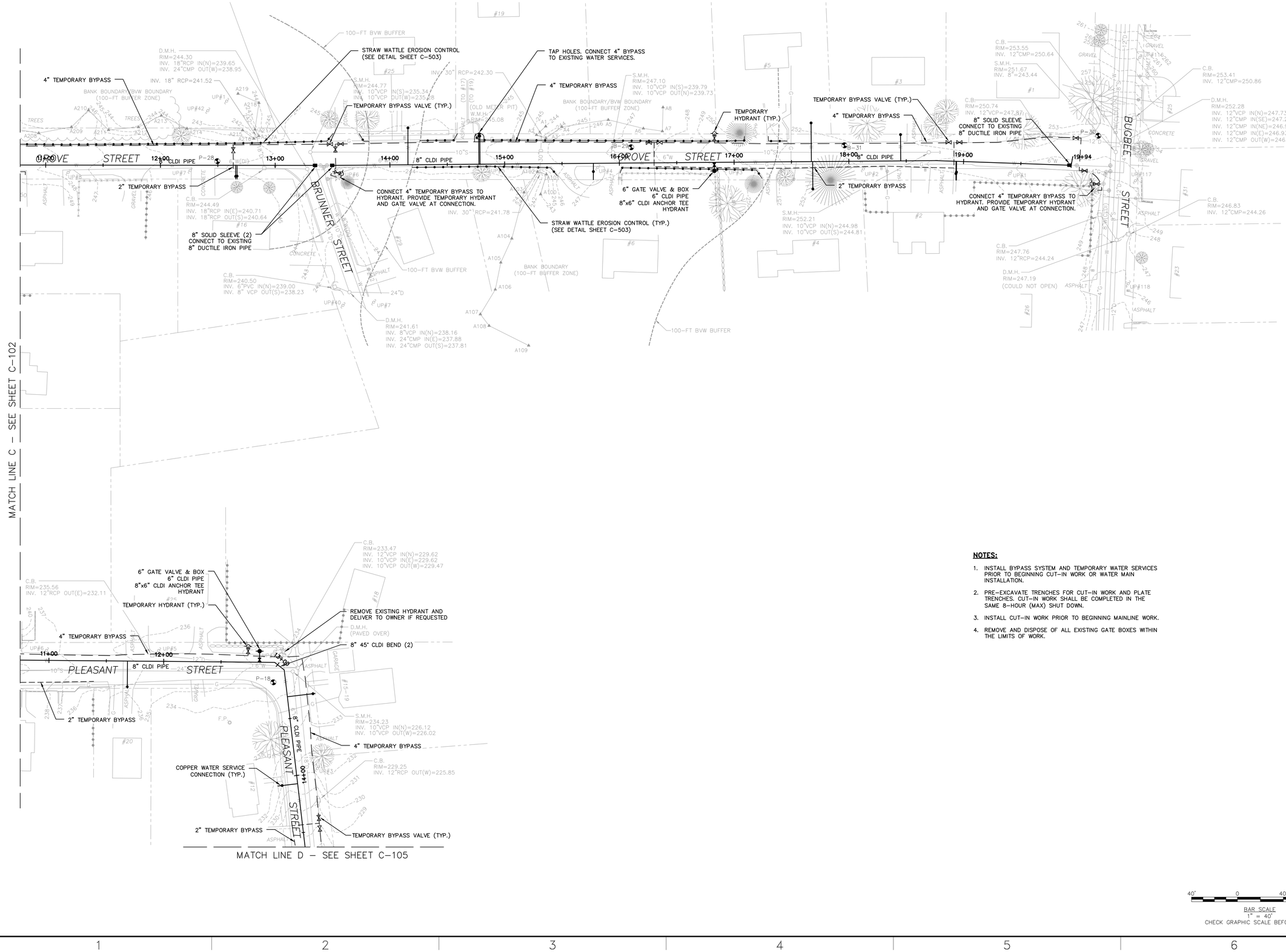

NOTES:

1. INSTALL BYPASS SYSTEM AND TEMPORARY WATER SERVICES PRIOR TO BEGINNING CUT-IN WORK OR WATER MAIN INSTALLATION.
2. PRE-EXCAVATE TRENCHES FOR CUT-IN WORK AND PLATE TRENCHES. CUT-IN WORK SHALL BE COMPLETED IN THE SAME 8-HOUR (MAX) SHUT DOWN.
3. INSTALL CUT-IN WORK PRIOR TO BEGINNING MAINLINE WORK.
4. REMOVE AND DISPOSE OF ALL EXISTING GATE BOXES WITHIN THE LIMITS OF WORK.

40' 0 40' 80'

BAR SCALE
1" = 40'
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GROVE STREET - 2,
PLEASANT STREET - 2

TOWN OF PLAINVILLE,
MASSACHUSETTS
DEPARTMENT OF PUBLIC WORKS

GROVE STREET & PLEASANT STREET
WATER MAIN IMPROVEMENTS

JOB NO.: 233560.00
DATE: MARCH 2022
SCALE: 1"=40'
SHEET: 6 OF 10

C-104

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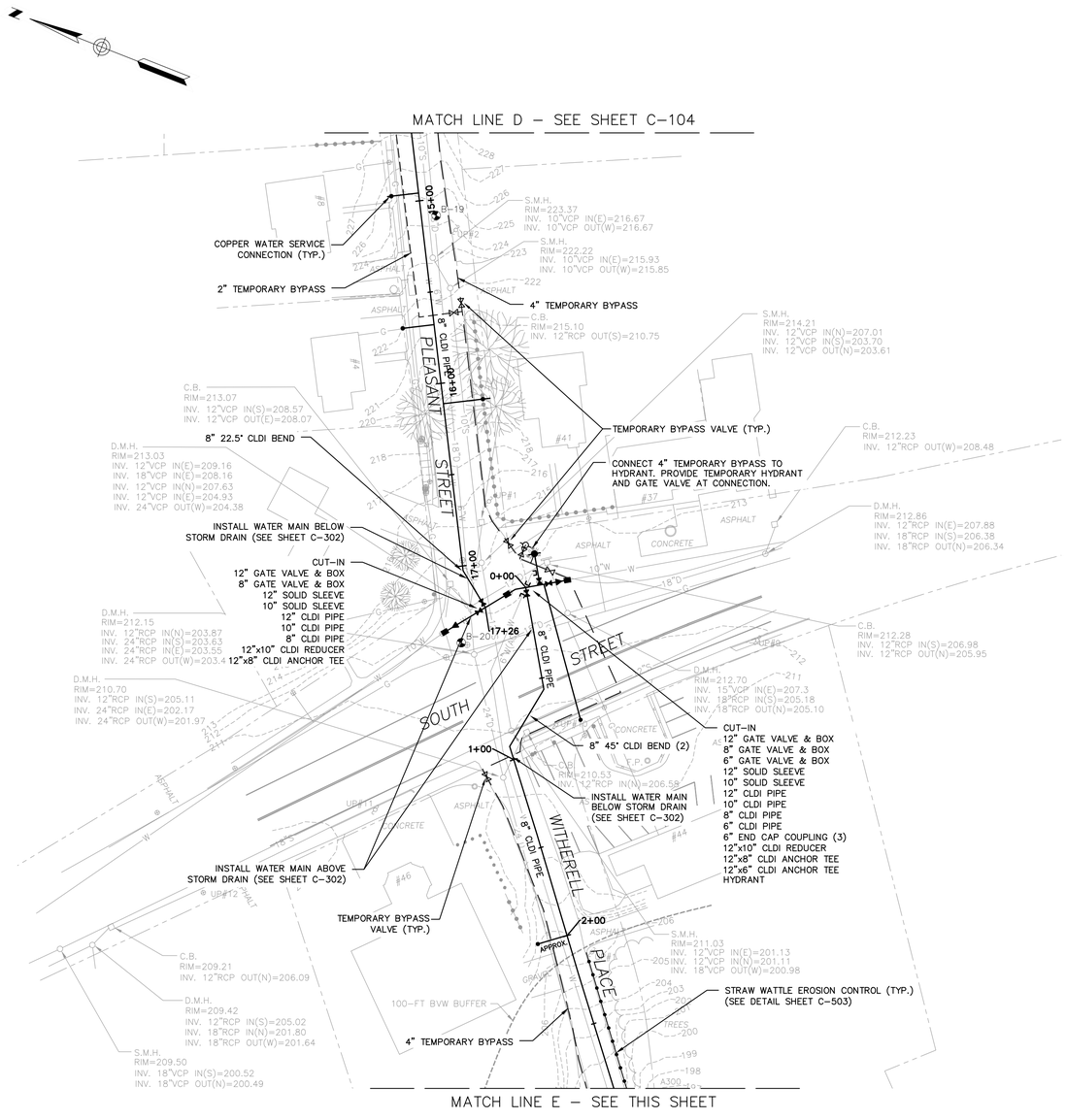

NOTES:

1. INSTALL BYPASS SYSTEM AND TEMPORARY WATER SERVICES PRIOR TO BEGINNING CUT–IN WORK OR WATER MAIN INSTALLATION. BYPASS FOR WITHERELL PLACE TO BE UNAFFECTED BY THE CUT–IN HYDRANT AT THE INTERSECTION OF SOUTH STREET AND PLEASANT STREET, SHUTDOWN OF WITHERELL PLACE BYPASS NOT ALLOWED.
2. PRE–EXCAVATE TRENCHES FOR CUT–IN WORK AND PLATE TRENCHES. CUT–IN WORK SHALL BE COMPLETED IN SINGLE, 8–HOUR (MAX) SHUTDOWN PERIOD.
3. INSTALL CUT–IN WORK PRIOR TO BEGINNING MAINLINE WORK.
4. RESTRAIN ALL JOINTS IN INTERSECTION.
5. REMOVE AND DISPOSE OF EXISTING AC WATER MAIN IN ACCORDANCE WITH LOCAL, STATE AND FEDERAL REQUIREMENTS AND AS REQUIRED IN THE CONTRACT DOCUMENTS.
6. REMOVE AND DISPOSE OF ALL EXISTING WATER VALVE BOXES AND SERVICE BOXES WITHIN THE LIMITS OF WORK.

40' 0 40' 80'

BAR SCALE
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PLEASANT STREET - 3, WITHERELL PLACE

TOWN OF PLAINVILLE, MASSACHUSETTS
DEPARTMENT OF PUBLIC WORKS

GROVE STREET & PLEASANT STREET WATER MAIN IMPROVEMENTS

JOB NO.: 233560.00
DATE: MARCH 2022
SCALE: 1"=40'
SHEET: 7 OF 10

C-105

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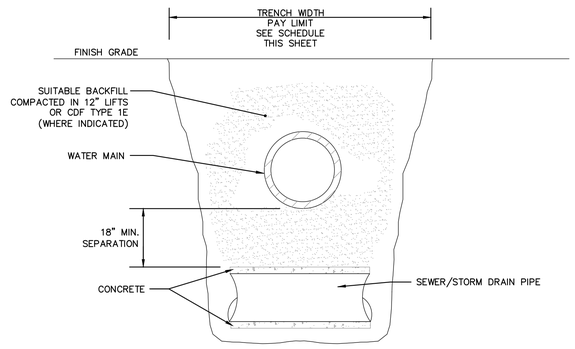
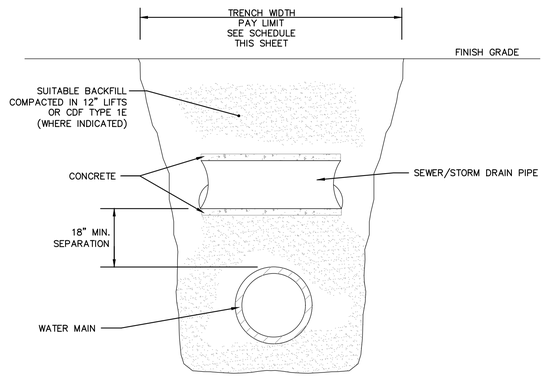


NOTE:

1. SEE ADDITIONAL REQUIREMENTS AS SPECIFIED IN SECTION 33 10 00.

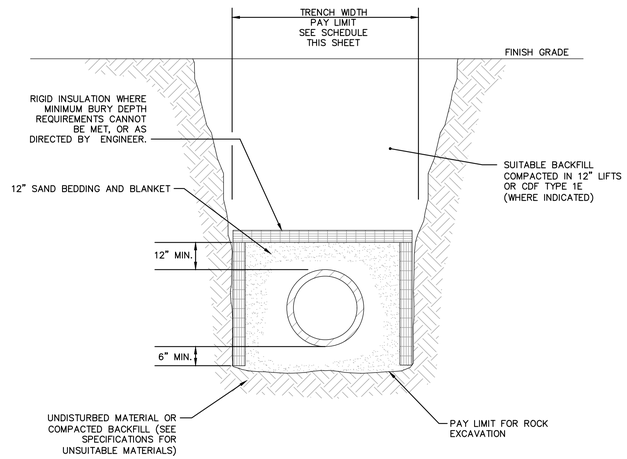
1 TYPICAL UTILITY CROSSING TRENCH DETAIL 1
N.T.S.



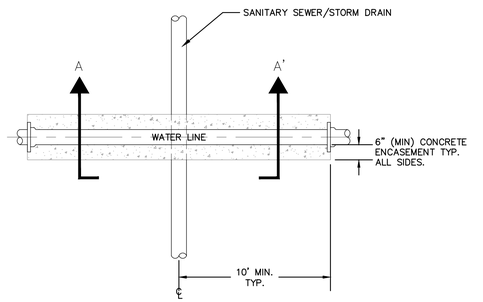
NOTE:

1. SEE ADDITIONAL REQUIREMENTS AS SPECIFIED IN SECTION 33 10 00.

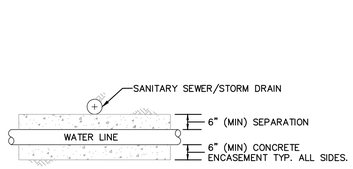
2 TYPICAL UTILITY CROSSING TRENCH DETAIL 2
N.T.S.



3 TYPICAL TRENCH DETAIL FOR PIPE INSULATION
N.T.S.



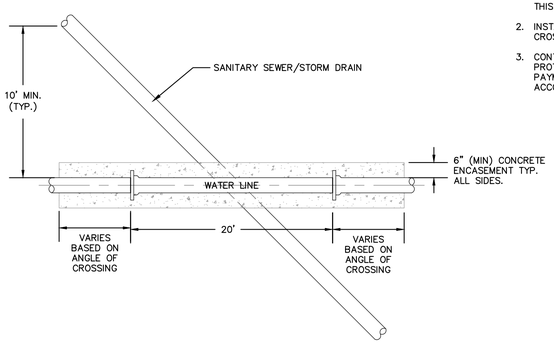
PERPENDICULAR CROSSING



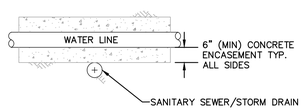
SECTION A–A' – WATER BELOW

NOTES:

1. WHEN POSSIBLE, CONTRACTOR SHALL INSTALL WATER MAIN CROSSINGS WITH MINIMUM SEPARATION AS SPECIFIED IN SECTION 33 14 11.01 IN LIEU OF PROTECTING WATER MAIN AS SHOWN IN THIS DETAIL.
2. INSTALL FULL 20–FOOT LENGTH OF WATER MAIN AT ALL CROSSINGS, CENTERED ON SEWER OR STORM DRAIN.
3. CONTRACTOR MAY SUBSTITUTE CARRIER PIPE FOR CONCRETE TO PROTECT WATER MAIN, AS SPECIFIED IN SECTION 33 14 11.01. PAYMENT FOR CONCRETE OR CARRIER PIPE WILL BE IN ACCORDANCE WITH SECTION 01 20 25.

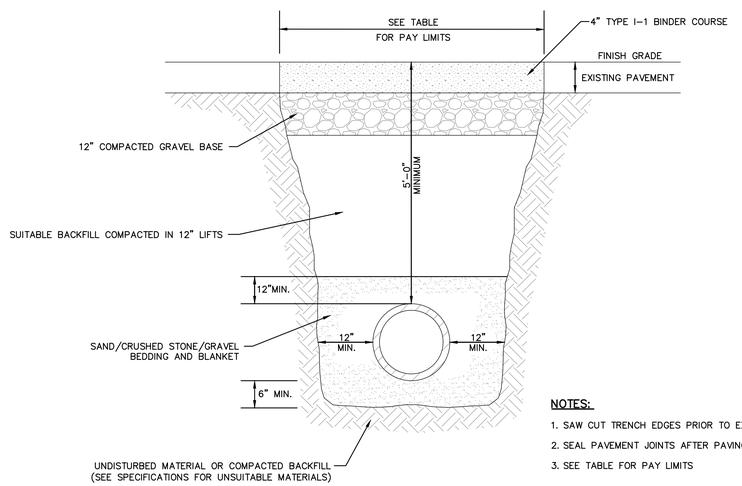


CROSSING AT ANGLE



SECTION A–A' – WATER ABOVE

4 WATER AND SEWER CROSSING DETAILS
N.T.S.

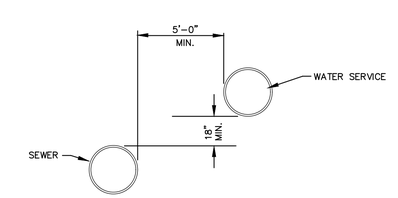


NOTES:

1. SAW CUT TRENCH EDGES PRIOR TO EXCAVATING.
2. SEAL PAVEMENT JOINTS AFTER PAVING.
3. SEE TABLE FOR PAY LIMITS

5 TYPICAL TRENCH DETAIL
N.T.S.

TRENCH, PAVEMENT & ROCK WIDTH PAY LIMITS (FT.)					
TRENCH DEPTH	NOMINAL PIPE DIAMETER (D)	TRENCH WIDTH	TEMPORARY TRENCH WIDTH PAVEMENT	PERMANENT TRENCH WIDTH PAVEMENT	ROCK EXCAVATION
0 TO 12'	0 TO 24"	4' – 0"	4' – 0"	6' – 0"	4' – 0"



UNUSUAL CONDITION
PARALLEL INSTALLATION

NOTES:

THE SEPARATION OF WATER MAINS AND SEWERS SHALL COMPLY WITH THE FOLLOWING GENERAL REQUIREMENTS.

A. PARALLEL INSTALLATION:

1. NORMAL CONDITIONS: THE INSIDE EDGE OF A WATER MAIN SHALL BE LAID AT LEAST 10 FEET HORIZONTALLY FROM THE INSIDE EDGE OF ANY SANITARY SEWER, STORM SEWER OR SEWER MANHOLE.
2. UNUSUAL CONDITIONS: WHEN LOCAL CONDITIONS PREVENT A HORIZONTAL SEPARATION OF 10 FEET, THE INSIDE EDGE OF A WATER MAIN MAY BE LAID A MINIMUM OF 5 FEET FROM THE INSIDE EDGE OF A SEWER PROVIDED THAT THE BOTTOM OF THE WATER MAIN IS AT LEAST 18 INCHES HIGHER THAN THE TOP OF THE SEWER (SEE DETAIL).

B. CROSSINGS:

1. NORMAL CONDITIONS: WHENEVER POSSIBLE, THE BOTTOM OF THE WATER MAIN SHALL BE AT LEAST 18 INCHES HIGHER THAN THE TOP OF THE SEWER.
2. UNUSUAL CONDITIONS: IF A WATER MAIN MUST CROSS UNDER A SEWER, THE TOP OF THE WATER MAIN SHALL BE AT LEAST 18 INCHES LOWER THAN THE BOTTOM OF THE SEWER, THE WATER MAIN PIPE SHALL BE CENTERED AT THE CROSSING SO THAT THE JOINTS ARE EQUIDISTANT AND AS FAR AS POSSIBLE FROM THE SEWER, AND ADEQUATE STRUCTURAL SUPPORT SHALL BE PROVIDED FOR THE SEWER TO PREVENT EXCESSIVE DEFLECTION OF THE SEWER AT THE CROSSING.

6 MINIMUM WATER AND SEWER PIPE SEPARATION DETAIL
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COMMONWEALTH OF MASSACHUSETTS
ARTHUR D. LEVENTIS
No. 34540
REGISTERED PROFESSIONAL ENGINEER

REV.	DESCRIPTION	DATE
DESIGNED BY: EVR	CHECKED BY: AJL	
DRAWN BY: EVR	233560.00_C-50X.dwg	

WATER MAIN DETAILS - 1

TOWN OF PLAINVILLE, MASSACHUSETTS
DEPARTMENT OF PUBLIC WORKS

GROVE STREET & PLEASANT STREET
WATER MAIN IMPROVEMENTS

JOB NO.: 233560.00
DATE: MARCH 2022
SCALE: NOT TO SCALE
SHEET: 8 OF 10

C-501

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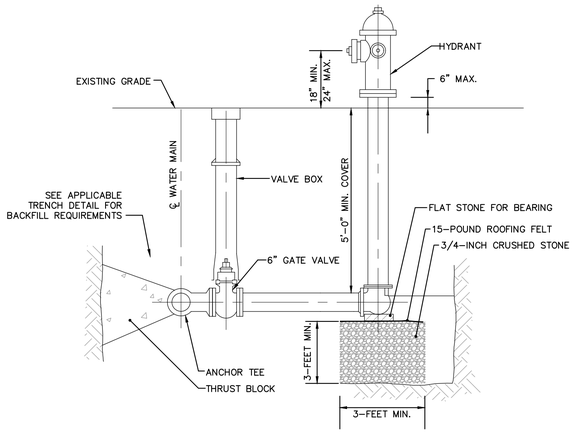
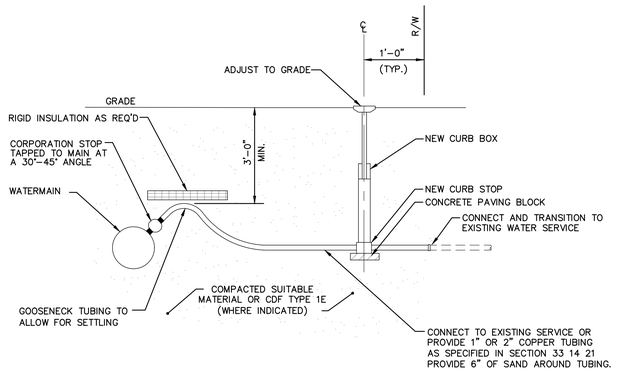


ELEVATION

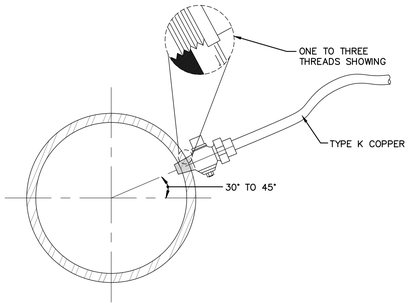
1 HYDRANT DETAIL
N.T.S.

NOTES:

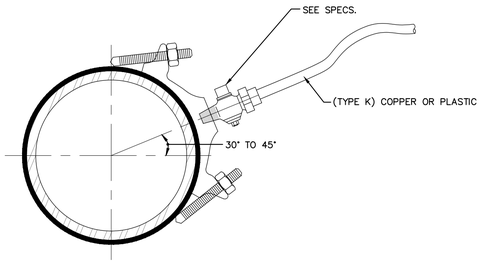
1. ALL JOINTS FOR HYDRANT INSTALLATION SHALL BE APPROVED RETAINER GLANDS.
2. WHERE POSSIBLE, CONSTRUCT HYDRANT LATERAL WITH ONE CONTINOUS PIPE LENGTH. WHERE MORE THAN 1 PIPE LENGTH IS REQUIRED, RESTRAIN ALL PIPE JOINTS WITH APPROVED RESTRAINT.
3. CONSTRUCT A HYDRANT DRAINING SUMP TO EITHER SIDE OF THE HYDRANT. THE HYDRANT DRAINING SUMP SHALL BE 4-FEET WIDE BY 3-FEET IN DEEP BY 3-FEET HIGH. THE SUMP SHALL CONSIST OF 3/4-INCH CRUSHED STONE WITH 15-POUND ROOFING FELT LAID OVER THE 3/4-INCH CRUSHED STONE.



2 TYPICAL WATER SERVICE DETAIL
N.T.S.



SERVICE TAP
(1" C.C. THREAD, DUCTILE IRON)
N.T.S.

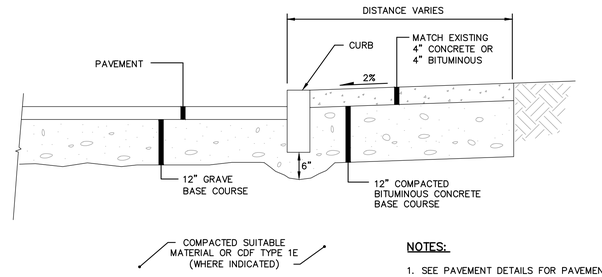


NOTES:

1. SERVICE CONNECTIONS (DIRECT TAPS AND SERVICE SADDLES) WILL BE INSTALLED SO THAT THE OUTLET IS AT AN ANGLE OF NOT MORE THAN 45° ABOVE THE HORIZONTAL. ALWAYS PUT A BEND OR "GOOSENECK" IN THE SERVICE LINE PRIOR TO CONNECTING TO PROVIDE FLEXIBILITY AND "GIVE" TO COUNTER THE EFFECTS OF A LOAD DUE TO SETTLEMENT OR EXPANSION AND/OR CONTRACTION (SEE DETAILS).
2. PLASTIC TUBING SHALL BE INSTALLED AS SPECIFIED IN SECTION 33 14 21.

3 SERVICE SADDLE
N.T.S.

(2" C.C. OR IRON PIPE THREAD, DUCTILE IRON)
(3/4" THROUGH 2" C.C. FOR CAST IRON)



NOTES:

1. SEE PAVEMENT DETAILS FOR PAVEMENT THICKNESS.
2. REPLACE SIDEWALK IN KIND.

5 TYPICAL REPLACEMENT SIDEWALK DETAIL
N.T.S.

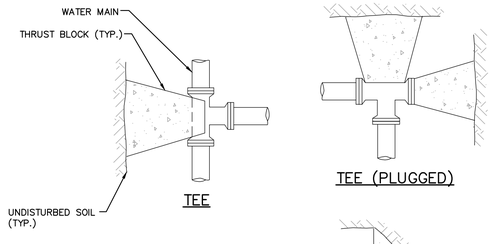


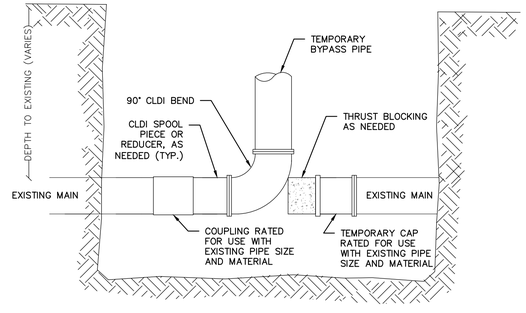
TABLE 1: 4" THRU 10" FITTINGS				
SOIL TYPE	TEES		BENDS	
	A	B	A	B
SOFT CLAY	48"	24"	48"	24"
SAND	24"	24"	24"	24"
GRAVEL	24"	18"	24"	18"

TABLE 2: 12" THRU 16" FITTINGS				
SOIL TYPE	TEES		BENDS	
	A	B	A	B
SOFT CLAY	60"	36"	72"	36"
SAND	36"	30"	48"	30"
GRAVEL	30"	24"	40"	24"

NOTES:

1. CONCRETE FOR ALL THRUST BLOCKS TO BE MINIMUM 3,000 PSI., 28 DAY STRENGTH, TYPE I CEMENT, 3/4" STONE.
2. WHERE POSSIBLE, CONSTRUCT THRUST BLOCKS AGAINST UNDISTURBED SOIL. WHERE NOT POSSIBLE, PLACE FILL BETWEEN THE THRUST BLOCK AND THE UNDISTURBED SOIL COMPACTED TO 95% STANDARD PROCTOR DENSITY.
3. WRAP FITTINGS WITH POLYETHYLENE PRIOR TO CONSTRUCTING THRUST BLOCKS. NO JOINTS SHALL BE COVERED WITH CONCRETE.
4. THRUST BLOCK DIMENSIONS ARE BASED ON A MAXIMUM WATER MAIN PRESSURE OF 150 PSI.

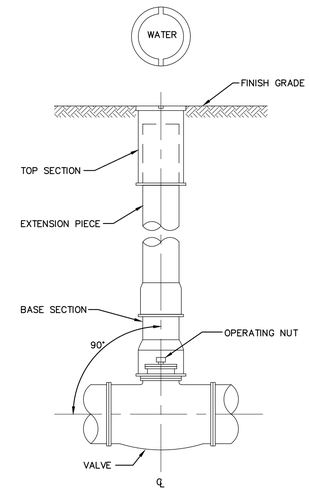
4 TYPICAL THRUST BLOCK DETAIL
N.T.S.



NOTES:

1. REMOVE BYPASS CONNECTION AND MJ CAP AND CONNECT TO EXISTING WATER MAIN ONCE WATER MAIN INSTALLATION HAS BEEN COMPLETED.
2. RESTRAIN ALL JOINTS.

6 TEMPORARY BYPASS CONNECTION (TAP HOLE) DETAIL
N.T.S.



7 VALVE WITH VALVE BOX
N.T.S.

WOODARD & CURRAN
40 Shattuck Road, Suite 110
Andover, Massachusetts 01810
866.702.6371 | www.woodardcurran.com
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COMMONWEALTH OF MASSACHUSETTS — ARTHUR D. LEVENTIS — No. 34540 — REGISTERED PROFESSIONAL ENGINEER

REV	DESCRIPTION	DATE
DESIGNED BY: EVR	CHECKED BY: AJL	
DRAWN BY: EVR	233560.00_C-50X.dwg	

WATER MAIN DETAILS - 2

TOWN OF PLAINVILLE, MASSACHUSETTS
DEPARTMENT OF PUBLIC WORKS

GROVE STREET & PLEASANT STREET WATER MAIN IMPROVEMENTS

JOB NO.: 233560.00
DATE: MARCH 2022
SCALE: NOT TO SCALE
SHEET: 9 OF 10

C-502

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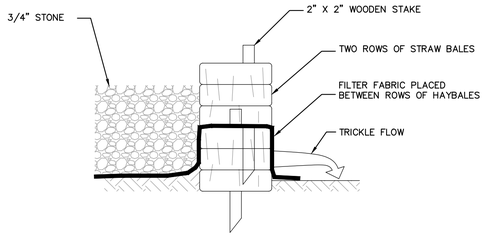
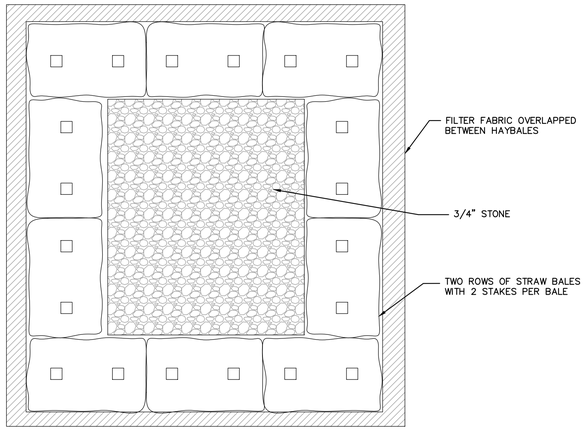


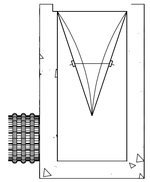


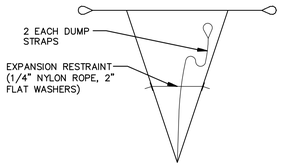
NOTES:

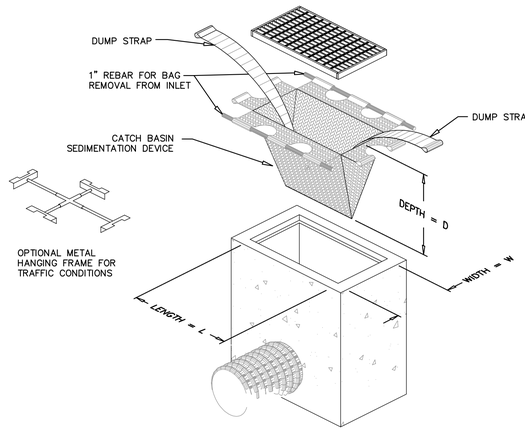
1. ALL BARRIERS SHALL BE INSPECTED IMMEDIATELY AFTER EACH RAINFALL AND AT LEAST DAILY DURING PROLONGED RAINFALL. ANY REQUIRED REPAIRS SHALL BE MADE IMMEDIATELY, AT NO ADDITIONAL COST TO THE OWNER..
2. SHOULD THE BARRIER DECOMPOSE OR BECOME INEFFECTIVE BEFORE THE END OF THE EXPECTED LIFE AND THE BARRIER IS STILL NECESSARY, IT SHALL BE REPLACED PROMPTLY.
3. SEDIMENT DEPOSITS SHALL BE REMOVED AFTER EACH STORM EVENT. THEY MUST BE REMOVED WHEN THE DEPOSITS REACH APPROXIMATELY ONE-HALF THE HEIGHT OF THE BARRIER.
4. ANY SEDIMENT DEPOSITS REMAINING IN PLACE AFTER THE BARRIER IS NO LONGER REQUIRED SHALL BE REMOVED AND DISPOSED.

1 DETENTION BASIN DETAIL

N.T.S.

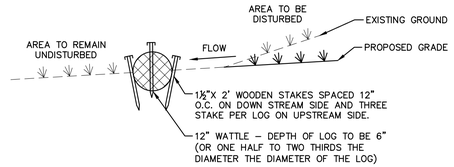




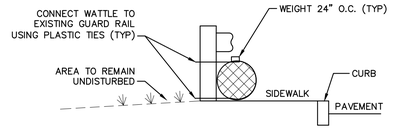


2 INLET SEDIMENT CONTROL DEVICE

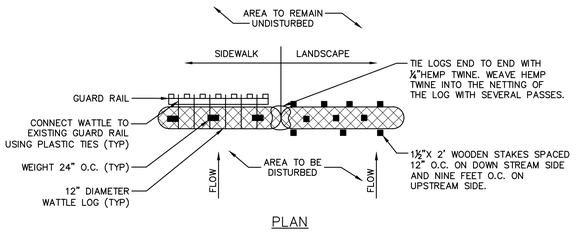
N.T.S.



SECTION AT LANDSCAPE AREA



SECTION AT SIDEWALK



PLAN

NOTE:

PROVIDE SILT FENCE WITH WATTLE AS APPLICABLE FOR LANDSCAPE OR SIDEWALK AREAS OF PROJECT.

3 STRAW WATTLE EROSION CONTROL

N.T.S.

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Andover, Massachusetts 01810
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COMMONWEALTH OF MASSACHUSETTS
ARTHUR D. LEVENTIS
No. 36540
REGISTERED PROFESSIONAL ENGINEER

REV	DESCRIPTION	DATE
	DESIGNED BY: EVR	
	DRAWN BY: EVR	
	CHECKED BY: AJL	
	233560.00_C-50X.dwg	

WATER MAIN DETAILS - 3

TOWN OF PLAINVILLE,
MASSACHUSETTS
DEPARTMENT OF PUBLIC WORKS

GROVE STREET & PLEASANT STREET
WATER MAIN IMPROVEMENTS

JOB NO.: 233560.00
DATE: MARCH 2022
SCALE: NOT TO SCALE
SHEET: 10 OF 10

C-503

\\woodardcurran.net\shared\Projects\v233560.00 Plainville MA Grove St Pleasant St Water Main\Project Record\Deliverables\Conformed Set\Drawings\Civil\233560_00_C-50X.dwg, Mar 09, 2022 - 11:45am

SECTION 00 52 10

CONFORMED AGREEMENT

THIS AGREEMENT is by and between Town of Plainville, MA ("Owner") and Gravity Construction, Inc. ("Contractor"). Owner and Contractor hereby agree as follows.

ARTICLE 1 – WORK

1.01 Contractor shall complete all Work as specified or indicated in the Contract Documents. The Work is generally described as providing approximately 7,125 linear feet of 6-inch to 10-inch diameter ductile iron water main on Grove Street, Pleasant Street, Potter Avenue, Lincoln Avenue, Melcher Street, and Witherell Place, including new valves, hydrants, fittings, and appurtenances, replacement of water services, curb stops and curb boxes, temporary bypass piping, temporary and permanent hot-mix asphalt pavement; and all materials, equipment, services and construction inherent to the Work.

ARTICLE 2 – THE PROJECT

2.01 The Project under the Contract Documents is generally known as "Grove St./Pleasant St. Watermain Replacement".

ARTICLE 3 – ENGINEER

3.01 The Project has been designed by Woodard & Curran, Inc. (Engineer), which is to act as Owner's representative, assume all duties and responsibilities and have the rights and authority assigned to Engineer in the Contract Documents in connection with the completion of the Work in accordance with the Contract Documents.

ARTICLE 4 – CONTRACT TIMES

4.01 *Time of the Essence*

A. All time limits for Milestones, if any, Substantial Completion, and completion and readiness for final payment as stated in the Contract Documents are of the essence of the Contract.

4.02 *Substantial Completion and Final Payment*

A. The Work shall be substantially complete within 220 calendar days from the commencement of Contract Times as provided in Paragraph 2.03 of the Standard General Conditions and completed and ready for final payment, in accordance with Paragraph 14.07 of the Standard General Conditions, 465 calendar days from the commencement of Contract Times.

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4.03 *Liquidated Damages*

A. Contractor and Owner recognize that time is of the essence as stated in Paragraph 4.01 above and that Owner will suffer financial loss if the Work is not completed within the times specified in Paragraph 4.02 above, plus any extensions thereof allowed in accordance with Article 12 of the Standard General Conditions and Supplementary Conditions, if any. The parties also recognize the delays, expense, and difficulties involved in proving in a legal or arbitration proceeding the actual loss suffered by Owner if the Work is not completed on time. Accordingly, instead of requiring any such proof, Owner and Contractor agree that as liquidated damages for delay (but not as a penalty), Contractor shall pay Owner **$1,500** for each day that expires after the time specified in Paragraph 4.02 above for Substantial Completion until the Work is substantially complete. After Substantial Completion, if Contractor shall neglect, refuse, or fail to complete the remaining Work within the Contract Time or any proper extension thereof granted by Owner, Contractor shall pay Owner **$1,500** for each day that expires after the time specified in Paragraph 4.02 above for completion and readiness for final payment until the Work is completed and ready for final payment.

ARTICLE 5 – CONTRACT PRICE

5.01 Owner shall pay Contractor for completion of the Work in accordance with the Contract Documents an amount in current funds equal to the sum of the amounts determined pursuant to Paragraph 5.01.A below based on unit pricing stated in Contractor's Bid attached hereto:

TOTAL PRICE

One Million Four Hundred Thirty Two Thousand Four Hundred Twenty Six Dollars and Sixty One Cents	**$1,432,426.61**

A. Unit Prices have been computed in accordance with Paragraph 11.03.A of the Standard General Conditions and Supplementary Conditions, if any.

B. The prices for Unit Price Work set forth as of the Effective Date of the Agreement are based on estimated quantities. As provided in Paragraph 11.03 of the Standard General Conditions and Supplementary Conditions, if any, estimated quantities are not guaranteed (except for those that may be estimated by the Contractor), and determinations of actual quantities and classifications are to be made by Engineer as provided in Paragraph 9.07 of the Standard General Conditions and Supplementary Conditions, if any. Final payment for unit price items will be based on actual quantities determined and based on the unit prices in the Unit Prices Form.

C. When the accepted quantity of any item of Unit Price Work performed by the Contractor (as measured in accordance with 9.07 of the General and Supplementary Conditions, if any) differs from the estimated quantity indicated in the attachment(s) to this Agreement for an item of Unit Price Work, no adjustment or allowance will be made for any increased expenses, loss of expected reimbursement, or loss of anticipated profits suffered or claimed by the Contractor resulting either directly or indirectly from such increased or decreased quantities, or from

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unbalanced allocation of overhead expense among the Unit Price Work items on the part of the Contractor, or subsequent loss of expected reimbursements therefor.

5.02 *Adjustments to the Contract Price*

A. Owner's Contingency(s)

1. Contractor agrees that any Owner's contingency(s) is for the sole use of Owner to cover estimated anticipated costs for certain items.

2. Prior to final payment, an appropriate Change Order will be issued as recommended by Engineer to reflect actual amounts due Contractor on account of Work covered by Owner's contingency(s), and the Contract Price shall be correspondingly adjusted. Contractor shall not receive payment for any unused portion of Owner's contingency(s).

B. Adjustments to the Contract Price will be made for diesel fuel, gasoline, liquid asphalt, and portland cement in cast-in-place concrete based on the Base Prices and index established for adjustments in accordance with price adjustment clauses included in Section 00 73 10, SC-12.01.

ARTICLE 6 – PAYMENT PROCEDURES

6.01 *Submittal and Processing of Payments*

A. Contractor shall submit Applications for Payment in accordance with Article 14 of the Standard General Conditions and Supplementary Conditions, if any. Applications for Payment will be processed by Engineer as provided in the Standard General Conditions and Supplementary Conditions, if any, and the General Requirements.

6.02 *Progress Payments; Retainage*

A. Owner shall make progress payments on account of the Contract Price on the basis of Contractor's Applications for Payment each month during performance of the Work as provided in Paragraph 6.02.A.1 below. All such payments will be measured by the schedule of values established as provided in Paragraph 2.07.A of the Standard General Conditions and Supplementary Conditions, if any, (and in the case of Unit Price Work based on the number of units completed).

1. Prior to Substantial Completion, progress payments will be made in an amount equal to the percentage indicated below but, in each case, less the aggregate of payments previously made and less such amounts as Engineer may determine or Owner may withhold, including but not limited to liquidated damages, in accordance with Paragraph 14.02 of the Standard General Conditions and Supplementary Conditions, if any, and additional retainage allowed by Laws and Regulations.

a. Progress Payments of 95 percent for Work completed (with the balance of 5 percent being retainage); and

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b. 95 percent of cost of materials and equipment not incorporated in the Work (with the balance of 5 percent being retainage).

2. Upon Substantial Completion, Owner shall pay an amount sufficient to increase total payments to Contractor to 99 percent of the Work completed (with the balance of 1 percent being retainage), less such amounts as Engineer shall determine in accordance with Paragraph 14.02.B.5 of the General Conditions and Supplementary Conditions, if any, and less the Engineer's estimate of the value of Work to be completed or corrected as shown on the tentative list of items to be completed or corrected (Punch List) attached to the certificate of Substantial Completion and subject to Paragraph 14.04 of the General Conditions and Supplementary Conditions, if any.

However, retainage for items planted in the ground shall remain at 5 percent of the cost of such items until Final Payment per Massachusetts General Laws Chapter 30, Section 39G.

6.03 *Final Payment*

A. Upon final completion and acceptance of the Work in accordance with Paragraph 14.07 of the General and Supplementary Conditions, if any, Owner shall pay the remainder of the Contract Price as recommended by Engineer as provided in said Paragraph 14.07.

ARTICLE 7 – INTEREST

7.01 All moneys not paid when due as provided in Article 14 of the General and Supplementary Conditions, if any, shall bear interest at the rate 3 percentage points above the rediscount rate then charged by the Federal Reserve Bank of Boston per Massachusetts General Laws Chapter 30, Section 39G. Interest shall not be accrued on retainage.

ARTICLE 8 – CONTRACTOR'S REPRESENTATIONS AND CERTIFICATIONS

8.01 In order to induce Owner to enter into this Agreement, Contractor makes the following representations:

A. Contractor has examined and carefully studied the Contract Documents and the other related data identified in the Bidding Documents.

B. Contractor has visited the Site and become familiar with and is satisfied as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work.

C. Contractor is familiar with and is satisfied as to all federal, state, and local Laws and Regulations that may affect cost, progress, and performance of the Work.

D. Contractor has carefully studied all: (1) reports of explorations and tests of subsurface conditions at or contiguous to the Site and all drawings of physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities), if any, that have been identified in Paragraph SC-4.02 of the Supplementary Conditions as containing reliable "technical data,"

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and (2) reports and drawings of Hazardous Environmental Conditions, if any, at the Site that have been identified in Paragraph SC-4.06 of the Supplementary Conditions as containing reliable "technical data."

E. Contractor has considered the information known to Contractor; information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the Contract Documents; and the Site-related reports and drawings identified in the Contract Documents, with respect to the effect of such information, observations, and documents on (1) the cost, progress, and performance of the Work; (2) the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor, including any specific means, methods, techniques, sequences, and procedures of construction expressly required by the Contract Documents; and (3) Contractor's safety precautions and programs.

F. Based on the information and observations referred to in Paragraph 8.01.E above, Contractor does not consider that further examinations, investigations, explorations, tests, studies, or data are necessary for the performance of the Work at the Contract Price, within the Contract Times, and in accordance with the other terms and conditions of the Contract Documents.

G. Contractor is aware of the general nature of work to be performed by Owner and others at the Site that relates to the Work as indicated in the Contract Documents.

H. Contractor has given Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Contractor has discovered in the Contract Documents, and the written resolution thereof by Engineer is acceptable to Contractor.

I. The Contract Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work.

8.02 The Contractor certifies, under the penalties of perjury, that:

A. Contractor has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for or in executing the Contract. For the purposes of this Paragraph:

1. "corrupt practice" means the offering, giving, receiving, or soliciting of anything of value likely to influence the action of a public official in the bidding process or in the Contract execution;

2. "fraudulent practice" means an intentional misrepresentation of facts made (a) to influence the bidding process or the execution of the Contract to the detriment of Owner, (b) to establish Bid or Contract prices at artificial non-competitive levels, or (c) to deprive Owner of the benefits of free and open competition;

3. "collusive practice" means a scheme or arrangement between two or more Bidders, with or without the knowledge of Owner, a purpose of which is to establish Bid prices at artificial, non-competitive levels; and

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4. "coercive practice" means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the bidding process or affect the execution of the Contract;

B. Contractor certifies no official or employee of the Owner has a financial interest in this Contract or in the expected profit to arise from the Contract, unless the Contractor and Owner, employee or official both have notified public authorities in writing, that the Contractor and the employee fully complied with the provisions of MGL Chapter 43, Section 27 *Interest In Public Contracts By Public Employees Prohibited; Penalty* and provisions of MGL Chapter 268A, Section 20 *Municipal Employees; Financial Interest In Contracts; Holding One Or More Elected Positions*.

C. Contractor has complied with all laws of the Commonwealth of Massachusetts relating to taxes, reporting of employees and contractors, and withholding and remitting of child support and, has provided for itself and each Subcontractor, a Certificate of Good Standing from the Department of Revenue with respect to all returns due and taxes and further, certifies that, to the best of its knowledge and belief, all state tax returns have been filed and all state taxes have been paid as required by Law pursuant to Massachusetts General Laws Chapter 62C, Section 49A.

D. If a foreign corporation, Contractor has provided for itself and each Subcontractor that is a foreign corporation, a certificate of the state secretary stating that the corporation has complied with requirements of Massachusetts General Laws Chapter 156D, Part 15, Section 15.03 of subdivision A and the date of compliance, and further has filed all annual reports required by Section 16.22 of subdivision B of Part 16 of said Chapter 156D, pursuant to Massachusetts General Laws Chapter 30, Section 39L.

E. Contractor is able to furnish labor that can work in harmony with all other elements of labor employed or to be employed in the Work and further certifies that all employees to be employed at the Work Site will have successfully completed a course in construction safety and health approved by the United States Occupational Safety and Health Administration that is at least 10 hours in duration at the time the employee begins Work and shall furnish documentation of successful completion of said course with the first certified payroll report for each employee, all as required by Massachusetts General Laws Chapter 30, Section 39S.

F. Contractor is not presently debarred from entering into a public contract Commonwealth of Massachusetts under the provisions of Massachusetts General Laws Chapter 29, Section 29F, or any other applicable debarment provisions of any other chapter of the General Laws or any rule or regulations promulgated thereunder; and is not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency.

G. Pursuant to Massachusetts General Laws Chapter 30, Section 39R, Contractor has provided a statement by management on internal accounting controls, a statement prepared by an independent certified public accountant regarding management's statement, and an audited financial statement to DCAMM for the most recent completed fiscal year.

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H. Contractor shall not participate in or cooperate with an international boycott, as defined in Section 999 (b)(3) and (4) of the Internal Revenue code 1986, as amended, or engage in conduct declared to be unlawful by Section 2 of Chapter 151E of the Massachusetts General Laws.

8.03 The representations and certifications Contractor submitted with its Bid shall remain valid during the period of this Agreement.

8.04 Contractor agrees to incorporate the applicable provisions of the Contract Documents into all subcontracts and Purchase Orders so that such provisions will be binding upon each Subcontractor or Supplier.

ARTICLE 9 – CONTRACT DOCUMENTS

9.01 *Contents*

A. The Contract Documents consist of the following:

1. This Agreement and attachments

COMPLETE LISTING AFTER AWARD

- Bid Form (submitted by Gravity Construction, Inc. and dated December 28, 2021)
- Bid Supplements and attachments
- Statements on internal accounting controls
- Performance Bond
- Payment Bond
- Certificate of Good Standing from the Department of Revenue with respect to all returns due and taxes
- Insurance certificates

2. Forms listed in 00 60 00

3. Standard General Conditions in Section 00 72 05

4. Supplementary Conditions as listed in Section 00 01 10, Table of Contents

5. General Requirements and Specifications as listed in Section 00 01 10, Table of Contents

6. Drawings listed in Section 00 01 15, List of Drawing Sheets

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7. The following which may be delivered or issued on or after the Effective Date of the Agreement and are not attached hereto:

   a. Notice to Proceed

   b. Work Change Directives

   c. Change Orders

B. The documents listed in Paragraph 9.01.A are attached to this Agreement and made a part hereof.

C. There are no Contract Documents other than those listed above in this Article 9.

D. The Contract Documents may only be amended, modified, or supplemented as provided in Paragraph 3.04 of the Standard General Conditions and Supplementary Conditions, if any.

ARTICLE 10 – MISCELLANEOUS

10.01 *Terms*

A. Terms used in this Agreement will have the meanings stated in the Standard General Conditions and Supplementary Conditions, if any.

10.02 *Assignment of Contract*

A. No assignment by a party hereto of any rights under or interests in the Contract will be binding on another party hereto without the written consent of the party sought to be bound; and, specifically but without limitation, moneys that may become due and moneys that are due may not be assigned without such consent (except to the extent that the effect of this restriction may be limited by law), and unless specifically stated to the contrary in any written consent to an assignment, no assignment will release or discharge the assignor from any duty or responsibility under the Contract Documents.

10.03 *Successors and Assigns*

A. Owner and Contractor each binds itself, its partners, successors, assigns, and legal representatives to the other party hereto, its partners, successors, assigns, and legal representatives in respect to all covenants, agreements, and obligations contained in the Contract Documents.

10.04 *Severability*

A. Any provision or part of the Contract Documents held to be void or unenforceable under any Law or Regulation shall be deemed stricken, and all remaining provisions shall continue to be valid and binding upon Owner and Contractor, who agree that the Contract Documents shall be reformed to replace such stricken provision or part thereof with a valid and enforceable provision that comes as close as possible to expressing the intention of the stricken provision.

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10.05 *Contract is Public Record*

A. The Contract is subject to MGL Chapter 66 et seq, *Public Records*, and as such, related submittals, purchase orders, related pricing documents, and invoices will be public documents, and may be available for public and private distribution, except as specifically excluded. The Contractor agrees to provide the Owner copies of any documents requested under this law at no charge to the Owner or the requestor.

SIGNATURES APPEAR ON THE FOLLOWING PAGE

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IN WITNESS WHEREOF, Owner and Contractor have signed this Agreement. Counterparts have been delivered to Owner and Contractor. All portions of the Contract Documents have been signed or have been identified by Owner and Contractor or on their behalf.

This Agreement will be effective on 4/26/22 (which is the Effective Date of the Agreement).

OWNER:
Town of Plainville, MA

By: BSNoble
Printed Name BRIAN NOBLE
Title TOWN ADMINISTRATOR

By:
Printed Name
Title

Attest:
Title
Address for giving notices:

(If Owner is a corporation, attach evidence of authority to sign. If Owner is a public body, attach evidence of authority to sign and resolution or other documents authorizing execution of this Agreement.)

CONTRACTOR:
Gravity Construction, Inc.

By: , President
Thomas P. Murphy
President

License No.

Attest:
Title
Address for giving notices:

Agent for service of process:

(If Contractor is a corporation, a partnership, or a joint venture, attach evidence of authority to sign.)

END OF SECTION

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Approved as to Form by:

_____
Counsel

Pursuant to MGL c.44, s31C, I certify that an appropriation has been made in the total amount of the Agreement.

_____
Julie Hebert
Owner's Auditor/Accountant (Name)
Date: 4/26/22

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