

May 16, 2019

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATION

DEPARTMENT OF ADMINISTRATION

DIVISION OF PURCHASES BID NO. 7598779

RHODE ISLAND DEPARTMENT OF TRANSPORTATION

RHODE ISLAND CONTRACT NO. 2018-CB-088

FEDERAL-AID PROJECT NO. FAP NO. BRO-0760(003)

BRIDGE GROUP 58A – DIVISION STREET

STA 44+48.20 TO STA 55+77.12

TOWN OF EAST GREENWICH

COUNTY OF KENT

NOTICE TO PROSPECTIVE BIDDERS

ADDENDUM NO. 2 Prospective bidders and all concerned are hereby notified of the following changes in the Plans, Specifications, Proposal and Distribution of Quantities for this contract. These changes shall be incorporated in the Plans, Specifications, Proposal and Distribution of Quantities, and shall become an integral part of the Contract Documents.

A. Other Item Changes

1. 201.0412 – REMOVE AND DISPOSE MANHOLE
Quest Item Added. Quantity updated to 1.
2. 201.0428 – REMOVE AND DISPOSE FRAME AND GRATE OR FRAME AND COVER
Quantity has been increased to 7.00.
3. 201.0623 – REMOVE AND DISPOSE OVERHEAD SIGN STRUCTURE
Quest Item Added. Quantity updated to 1.00.
4. 202.0700 – COMMON BORROW
Quantity updated to 3885 CY.

5. 202.0800 – GRAVEL BORROW
Quest Item Added. Quantity updated to 7,000 CY.
6. 203.0100 – STRUCTURAL EXCAVATION EARTH
Quantity updated to 12,000 CY.
7. 206.0312 – COMPOST FILTER SOCK 12 INCH DIAMETER
Quantity updated to 4000 LF.
8. 410.1000 – TEMPORARY PATCHING MATERIAL/TRENCHES
Quantity updated to 325 TON.
9. 701.5812 – 12 INCH DUCTILE IRON WATER PIPE CLASS 56, MECHANICAL JOINT. Item has been deleted.
10. 701.8112 – 12 INCH GATE VALVE AND BOX.
Quantity has been updated to 8.00.
11. 702.0516 – FRAME AND GRATE, HIGH CAPACITY STANDARD 6.3.4.
Quantity Updated to 13.00
12. 702.0717 – DOUBLE GRATE CATCH BASIN STANDARD 3.3.5
Quantity Updated to 3.00
13. 702.9902 – STORMWATER TREATMENT UNIT (JELLYFISH)
Quest Item Added. Quantity Updated to 2.
14. 803.0500 – TEMPORARY DECK UNDERSIDE AND SIDE PROTECTIVE SHIELDING
Quantity updated to 19,300 SF.
15. 805.9901 – MSE WRAP FACE RETAINING WALL SYSTEM
Quantity updated to 1020 SY.
16. 805.9903 – MSE WALLS AND CONCRETE FACING
Quantity updated to 400 SY.
17. 808.1502 – CONCRETE SUPERSTRUCTURE CLASS HP ¾” BRIDGE SIDEWALKS
Quantity updated to 85CY.
18. 808.1503 – CONCRETE SUPERSTRUCTURE CLASS HP ¾” PARAPETS
Quantity updated to 25CY.
19. T16.0300 – Ground Mounted Primary Directional Sign Post-Steel Breakaway. Quest Item Added. Quantity Updated to 2.

- 20. T17.0100 – OVERHEAD SIGN PANELS
Quantity Updated to 560SF.
- 21. T17.9901 – OVERHEAD SIGN STRUCTURE 81’ TO 85’ SPAN - STEEL
Quantity Item Deleted.

B. Drawings/Plans – Change/Addition

- 1. Sheet 8
Delete Sheet 8 in its entirety and replace it with Sheet No. 8 (Rev No. 1) attached to this Addendum No. 2.
- 2. Sheet 10
Delete Sheet 10 in its entirety and replace it with Sheet No. 10 (Rev No. 1) attached to this Addendum No. 2.
- 3. Sheet 11
Delete Sheet 11 in its entirety and replace it with Sheet No. 11 (Rev No. 1) attached to this Addendum No. 2.
- 4. Sheet 12
Delete Sheet 12 in its entirety and replace it with Sheet No. 12 (Rev No. 1) attached to this Addendum No. 2.
- 5. Sheet 13
Delete Sheet 13 in its entirety and replace it with Sheet No. 13 (Rev No. 1) attached to this Addendum No. 2.
- 6. Sheet 14
Delete Sheet 14 in its entirety and replace it with Sheet No. 14 (Rev No. 1) attached to this Addendum No. 2.
- 7. Sheet 15
Delete Sheet 15 in its entirety and replace it with Sheet No. 15 (Rev No. 1) attached to this Addendum No. 2.
- 8. Sheet 22
Delete Sheet 22 in its entirety and replace it with Sheet No. 22 (Rev No. 1) attached to this Addendum No. 2.
- 9. Sheet 23
Delete Sheet 23 in its entirety and replace it with Sheet No. 23 (Rev No. 1) attached to this Addendum No. 2.
- 10. Sheet 24
Delete Sheet 24 in its entirety and replace it with Sheet No. 24 (Rev No. 1) attached to this Addendum No. 2.

11. Sheet 27
Delete Sheet 27 in its entirety and replace it with Sheet No. 27 (Rev No. 1) attached to this Addendum No. 2.
12. Sheet 37
Delete Sheet 37 in its entirety and replace it with Sheet No. 37 (Rev No. 1) attached to this Addendum No. 2.
13. Sheet 38
Delete Sheet 38 in its entirety and replace it with Sheet No. 38 (Rev No. 1) attached to this Addendum No. 2.
14. Sheet 39
Delete Sheet 39 in its entirety and replace it with Sheet No. 39 (Rev No. 1) attached to this Addendum No. 2.
15. Sheet 51
Delete Sheet 51 in its entirety and replace it with Sheet No. 51 (Rev No. 1) attached to this Addendum No. 2.
16. Sheet 75
Delete Sheet 75 in its entirety and replace it with Sheet No. 75 (Rev No. 1) attached to this Addendum No. 2.
17. Sheet 104
Delete Sheet 104 in its entirety and replace it with Sheet No. 104 (Rev No. 1) attached to this Addendum No. 2.
18. Sheet 119A
Add Sheet 119A as attached to this Addendum No. 2.

C. General Provisions – Contract Specific

1. Appendix A
Delete pages 2 and 15 in their entirety and replace them with pages 2 and 15 (Rev. No. 1) attached to this Addendum No. 2.
2. Appendix A – Attachment 1
Delete Traffic-Related Work Restrictions/General Restrictions (Attachment 1) in its entirety and replace with Traffic-Related Work Restrictions/General Restrictions Rev01 (Attachment 1) attached to this Addendum No. 2.
3. Appendix D
Add Appendix D attached to this Addendum No. 2.

D. General Provisions – Job Specific

1. 701.9902 – Delete pages 24-26 in their entirety and replace with pages JS-24 (Rev No.1), JS-25 (Rev No.1) and JS-26 (Rev No. 1) attached to this Addendum No. 2.
2. 702.9902 – STORMWATER TREATMENT UNIT (JELLYFISH)
Add pages JS-29A through JS-29I attached to this Addendum No. 2. New Section 702.9902 has been added.
3. 805.9901 – MSE WRAP FACE RETAINING WALL SYSTEM
Remove page 52 in its entirety and add page JS-52 (Rev No. 1) attached to this Addendum No. 2.
4. 808.9901 CONCRETE SUPERSTRUCTURE CLASS HP 3/8” BRIDGE DECK CLOSURE POURS
Delete pages 60 and 61 in their entirety and replace it with page JS-60 and JS-61 (Rev No.1) attached to this Addendum No. 2.
5. 825 – PAINTING OF STRUCTURAL STEEL
Delete page 68 in its entirety and replace it with page JS-68 (Rev No.1) attached to this Addendum No. 2.
6. 938.000 – PRICE ADJUSTMENTS
Remove page 94 in its entirety and replace with page JS-94 (Rev No. 1) attached to this Addendum No. 2. In addition, Add page JS-95A.

E. Distribution of Quantities

1. Index
Delete pages 1 through 4 and in their entirety and replace them with pages 1 (Rev No.1) through page 4 (Rev No. 1) attached to this Addendum No. 2. The Index has been revised.
2. 201.0428 – REMOVE AND DISPOSE FRAME AND GRATE OR FRAME AND COVER
Remove page 3 in its entirety and replace with page 3 (R-1) and add page 3a attached to this Addendum No. 2. Quantity has been increased to 13.00.
3. 201.0623 – REMOVE AND DISPOSE OVERHEAD SIGN STRUCTURE
Add page 43 and 44 attached to this Addendum No. 2. Item has been added.
4. 202.0700 COMMON BORROW
Remove page 5 in its entirety and replace it with page 5 (R-1) attached to this Addendum No. 2. Quantity has been updated.
5. 202.0800 GRAVEL BORROW
Add page 43 and 44 attached to this Addendum No. 2. Quantity has been added.
6. 203.0100 STRUCTURAL EXCAVATION EARTH

Remove page 6 in its entirety and add page 6 (R-1) attached to this Addendum No. 2. Quantity has been updated.

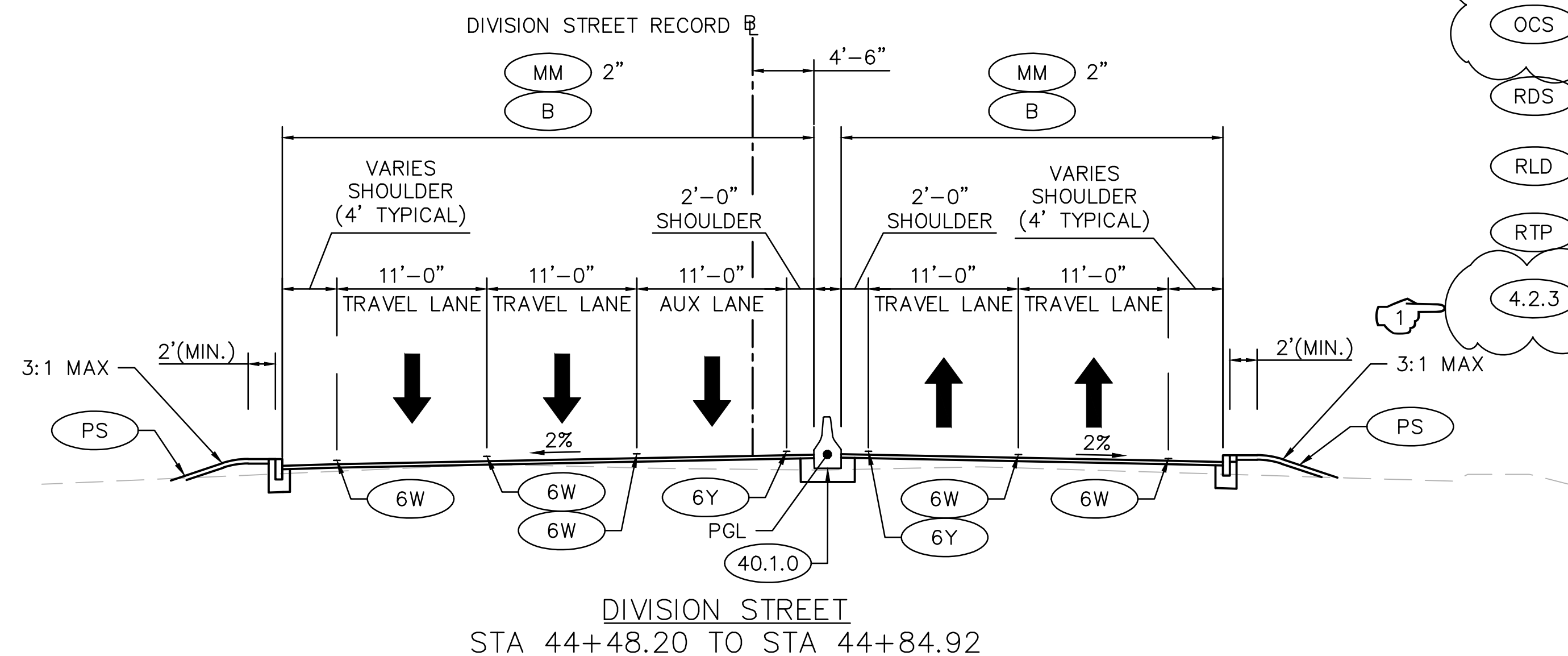
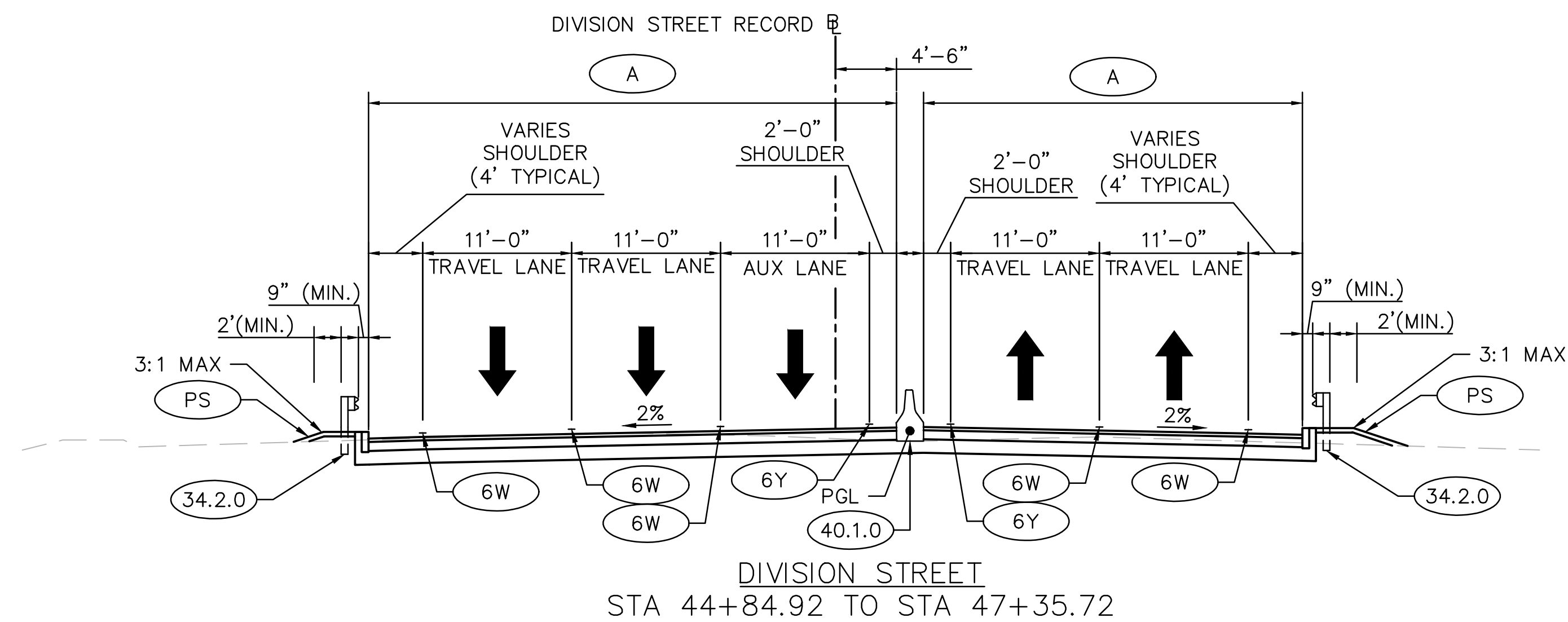
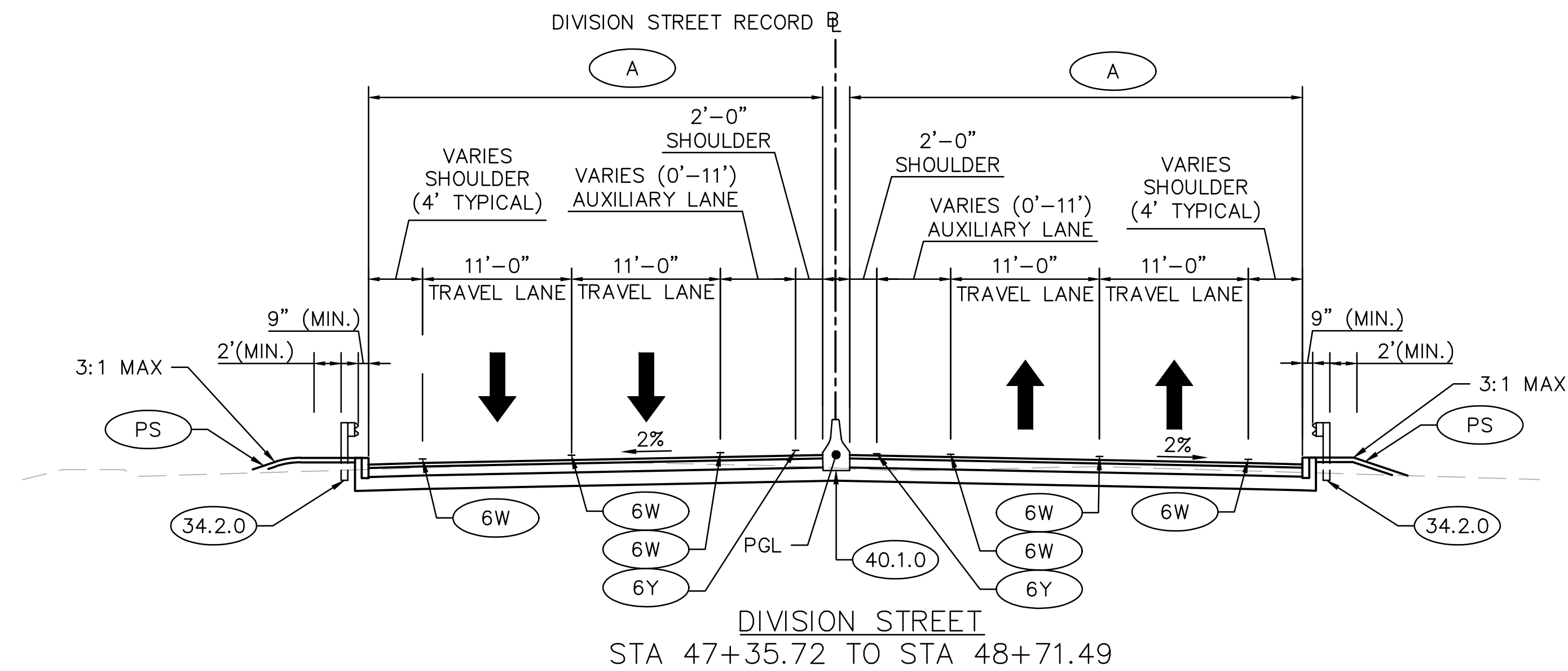
7. 206.0312 – COMPOST FILTER SOCK 12 INCH
Remove page 7 in its entirety and replace it with page 7 (R-1) attached to this Addendum No. 2. Quantity has been updated.
8. 410.1000 – TEMPORARY PATCHING MATERIAL/TRENCHES
Remove page 11 in its entirety and replace it with page 11 (R-1) attached to this Addendum No. 2. Quantity has been updated.
9. 701.5812 – 12 INCH DUCTILE IRON WATER PIPE CLASS 56, MECHANICAL JOINT. Remove page 12 in its entirety and replace with page 12 (R-1) attached to this Addendum No. 2. Item has been deleted.
10. 701.8112 – 12 INCH GATE VALVE AND BOX
Remove page 12 in its entirety and replace with page 12 (R-1) attached to this Addendum No. 2. Item has been updated.
11. 702.0516 – FRAME AND GRATE, HIGH CAPACITY STANDARD 6.3.4.
Remove page 14 in its entirety and replace it with page 14 (R-1) attached to this Addendum No. 2. Item has been updated.
12. 702.0717 – DOUBLE GRATE CATCH BASIN STANDARD 3.3.5
Remove page 15 and 16 in their entirety and replace them with pages 15 and 16 (R-1) attached to this Addendum No. 2. Item has been updated.
13. 702.9902 – STORMWATER TREATMENT UNIT (JELLYFISH)
Add page 43 and 44 attached to this Addendum No. 2. Quantity has been added.
14. 803.0500 – TEMPORARY DECK UNDERSIDE AND SIDE PROTECTIVE SHIELDING
Remove page 18 in its entirety and replace it with page 18 (R-1) attached to this Addendum No. 2. Quantity has been updated.
15. 805.9901 – MSE WRAP FACE RETAINING WALL SYSTEM
Remove page 19 in its entirety and replace it with page 19 (R-1) attached to this Addendum No. 2. Quantity has been updated.
16. 805.9903 – MSE WALLS PRECAST CONCRETE FACING
Remove page 20 in its entirety and replace it with page 20 (R-1) attached to this Addendum No. 2. Quantity has been updated.
17. 808.1502 – CONCRETE SUPERSTRUCTURE CLASS HP ¾” BRIDGE SIDEWALKS
Remove page 22 in its entirety and replace it with page 22 (R-1) attached to this Addendum No. 2. Quantity has been updated.

18. 808.1503 – CONCRETE SUPERSTRUCTURE CLASS HP ¾” PARAPETS
Remove page 22 in its entirety and replace it with page 22 (R-1) attached to this Addendum No. 2. Quantity has been updated.
19. T16.0300 – Ground Mounted Primary Directional Sign Post-Steel Breakaway. Quest Item Added. Quantity Updated to 2.
20. T17.0100 – OVERHEAD SIGN PANELS
Remove page 40 in its entirety and replace it with page 40 (R-1) attached to this Addendum No. 2. Quantity has been updated.
21. T16.0300 – Ground Mounted Primary Directional Sign Post-Steel Breakaway
Add page 43 and 44 attached to this Addendum No. 2. Quantity has been added.
22. T17.9901 – OVERHEAD SIGN PANELS
Remove page 40 in its entirety and replace it with page 40 (R-1) attached to this Addendum No. 2.



RI Department of Transportation
Administrator, Division of Project Management

FED. ROAD DIV. NO.	STATE	FEDERAL AID PROJECT NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
1	RI	BRO-0760(003)	2018	8	134



JOB SPECIFIC LEGEND:

- | | | | |
|-------|--|--------|---|
| RSR | REMOVE STOCKPILE AND RECONSTRUCT STONE WALL | RES | RETAIN SIGN |
| CFS | COMPOST FILTER SOCK | RSL | REMOVE AND STOCKPILE LIGHT POST AND FOUNDATION
INSTALL LIGHT POST AND FOUNDATION |
| TBG | THREE BEAM GUARDRAIL | WYL | WHITE YIELD LINE |
| OSS | OVERHEAD SIGN STRUCTURE 66-70 FOOT SPAN - STEEL | 34.3.5 | GUARDRAIL CONNECTION TO EXISTING END POST APPROACH END SECTION |
| OCSS | OVERHEAD SIGN STRUCTURE 26-30 FOOT CANTILEVER - STEEL | 34.3.6 | GUARDRAIL CONNECTION TO EXISTING END POST TRAILING END SECTION |
| RDS | REMOVE AND DISPOSE OVERHEAD SIGN PANEL | 6SS | 6" EPOXY RESIN PAVEMENT MARKINGS - WHITE (4' SPACE/2' STRIPE) |
| RLD | REPLACE LOOP DETECTOR | MCB | MODIFIED PRECAST PERPENDICULAR DOUBLE GRATE CATCH BASIN 4' SQUARE |
| RTP | RETAIN TRAFFIC POLE | DGC | REMOVE AND DISPOSE GRANITE CURB |
| 4.2.3 | PRECAST 4'-0" ROUND MANHOLE WITH MEMBRANE FILTER JF6-6-1 | | |
| | | | |

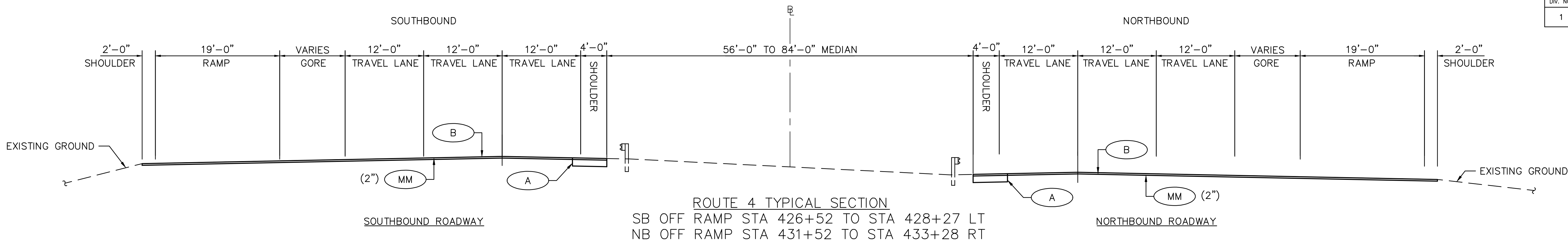
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PARSONS
100 HIGH STREET, BOSTON, MA 02110
TEL: (617)946-9400 FAX: (617)946-9777

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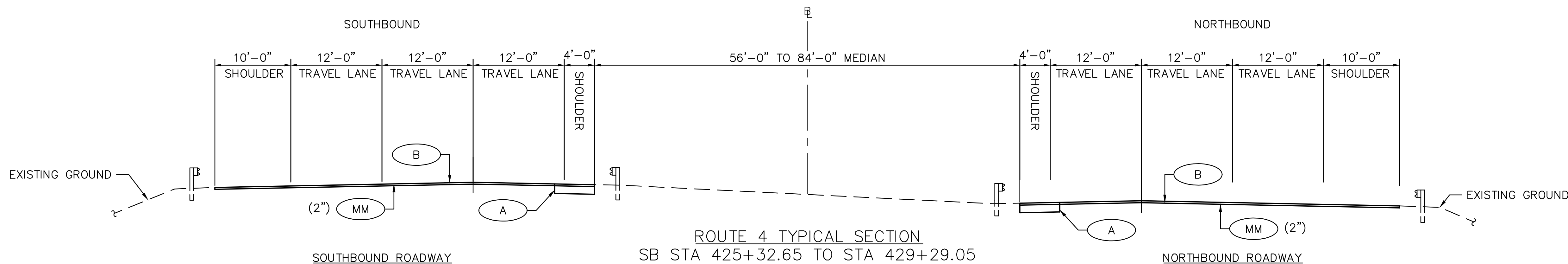
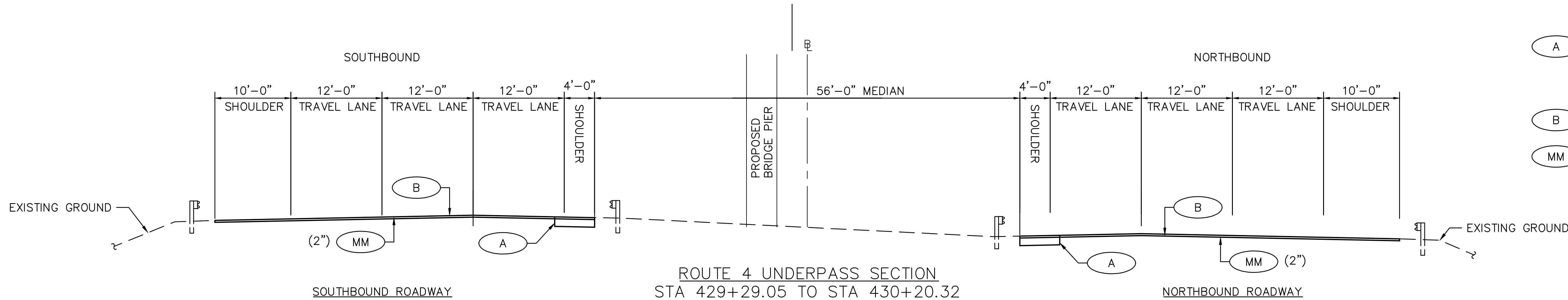
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FED. ROAD DIV. NO.	STATE	FEDERAL AID PROJECT NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
1	RI	BRO-0760(003)	2018	10	134



PAVEMENT NOTES:

- A 1.5" FRICTION COURSE (402.9901)
2" CLASS 12.5 HMA
4" CLASS 19.0 HMA
12" GRAVEL BORROW SUBBASE COURSE
- B 1.5" FRICTION COURSE (402.9901)
- MM MICRO MILLING



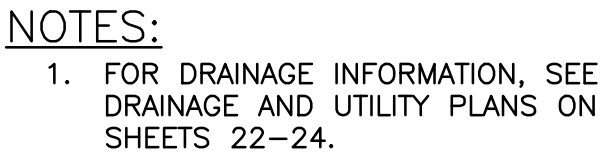
NOTE:

ON ROUTE 4, WHERE WIDENING IS PROPOSED, THE 2 INCH CLASS 9.5 HMA OVER THE WIDENED SECTION SHOULD BE APPLIED AT THE SAME TIME WITH THE MICRO-MILLED SURFACE TO AVOID A COLD JOINT.

REVISIONS				RHODE ISLAND	
NO.	DATE	BY		DEPARTMENT OF TRANSPORTATION	
1	5/19	RGN		BRIDGE REPLACEMENT	
				GROUP 58B - DIVISION STREET BRIDGE NO. 760	
				EAST GREENWICH RHODE ISLAND	
				TYPICAL SECTIONS	
				SHEET 3 OF 3	
				CHECKED BY <u>KPD</u> DATE <u>02/17/17</u> SCALE <u>NO SCALE</u>	

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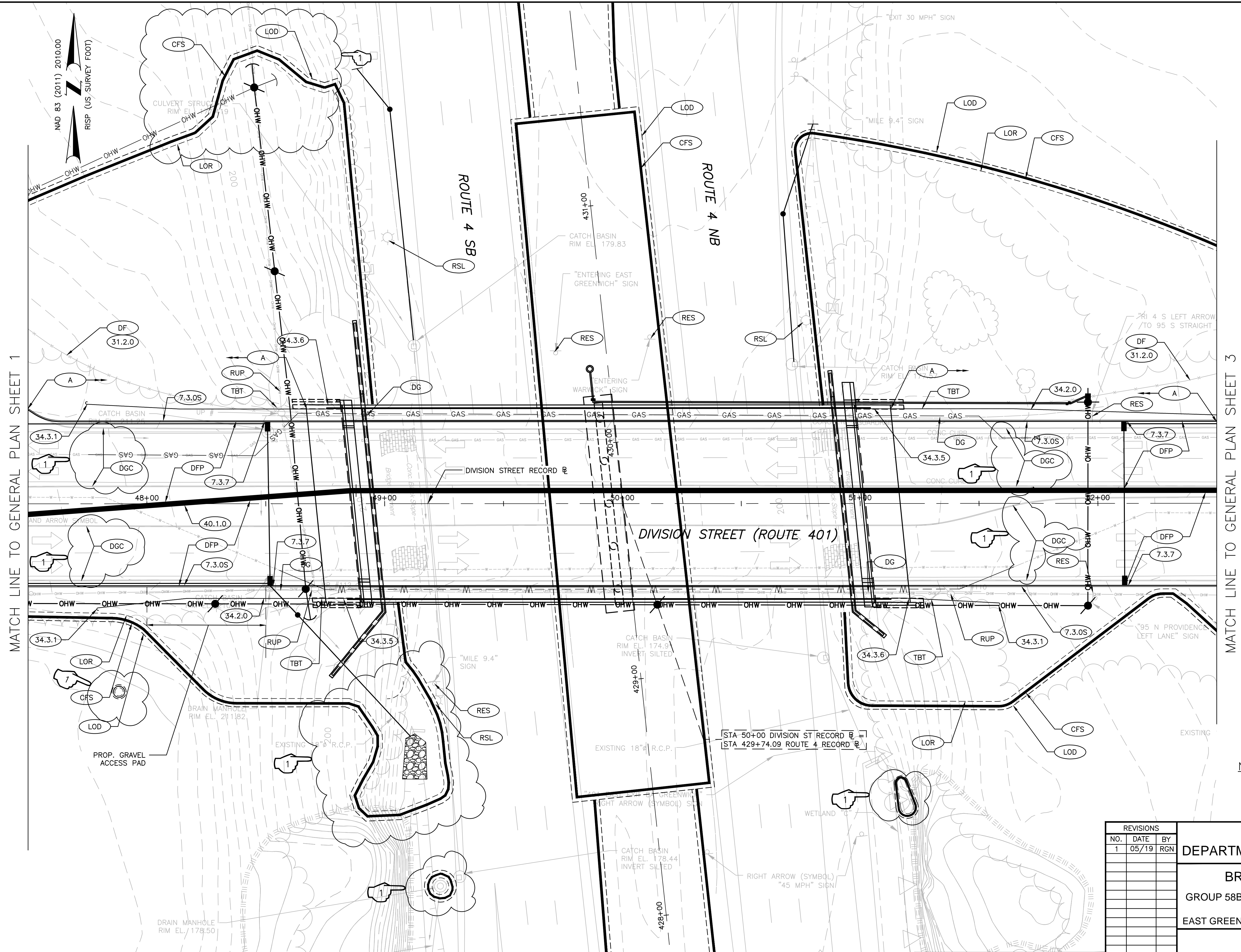
NAD 83 (2011) 2010.00
RISP (US SURVEY FOOT)



RHODE ISLAND DEPARTMENT OF TRANSPORTATION		
BRIDGE REPLACEMENT GROUP 58B - DIVISION STREET BRIDGE NO. 760 EAST GREENWICH RHODE ISLAND		
GENERAL PLAN SHEET 1 OF 5		
CHANGED BY	KPD	DATE 02/17/17 SCALE 1"=20'

P PARSONS
100 HIGH STREET, BOSTON, MA 02110
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FED. ROAD DIV. NO.	STATE	FEDERAL AID PROJECT NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
1	RI	BRO-0760(003)	2018	12	134



NOTES:

1. FOR DRAINAGE INFORMATION, SEE DRAINAGE AND UTILITY PLANS ON SHEETS 22-24.

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RHODE ISLAND
DEPARTMENT OF TRANSPORTATION

BRIDGE REPLACEMENT

GROUP 58B - DIVISION STREET BRIDGE NO. 760

EAST GREENWICH RHODE ISLAND

GENERAL PLAN

SHEET 2 OF 5

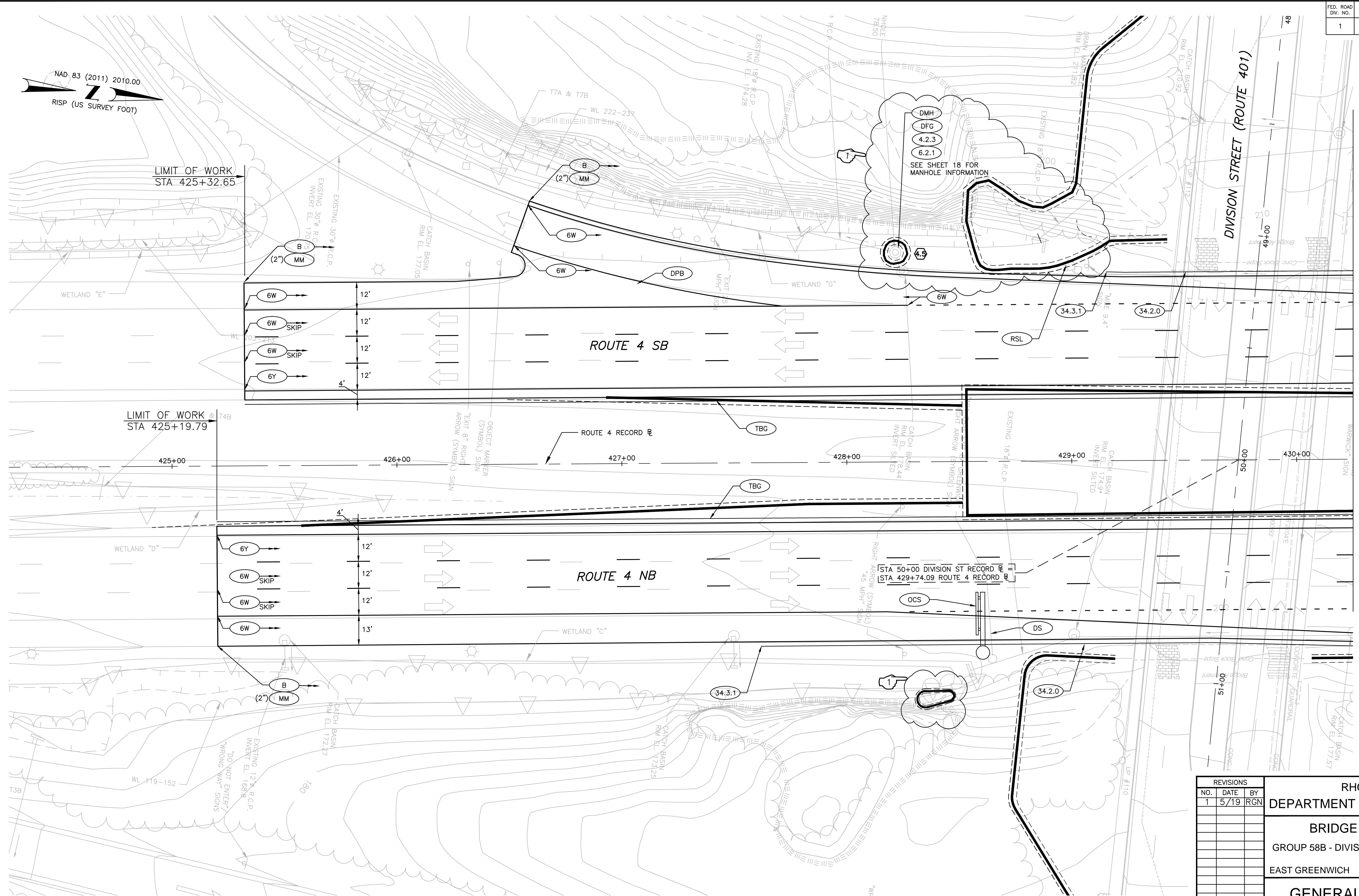
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FED. ROAD DIV. NO.	STATE	FEDERAL AID PROJECT NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
1	RI	BRO-0760(003)	2018	14	134



MATCH LINE TO GENERAL PLAN ROUTE 4 SHEET 2

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RHODE ISLAND
DEPARTMENT OF TRANSPORTATION

BRIDGE REPLACEMENT

GROUP 58B - DIVISION STREET BRIDGE NO. 760

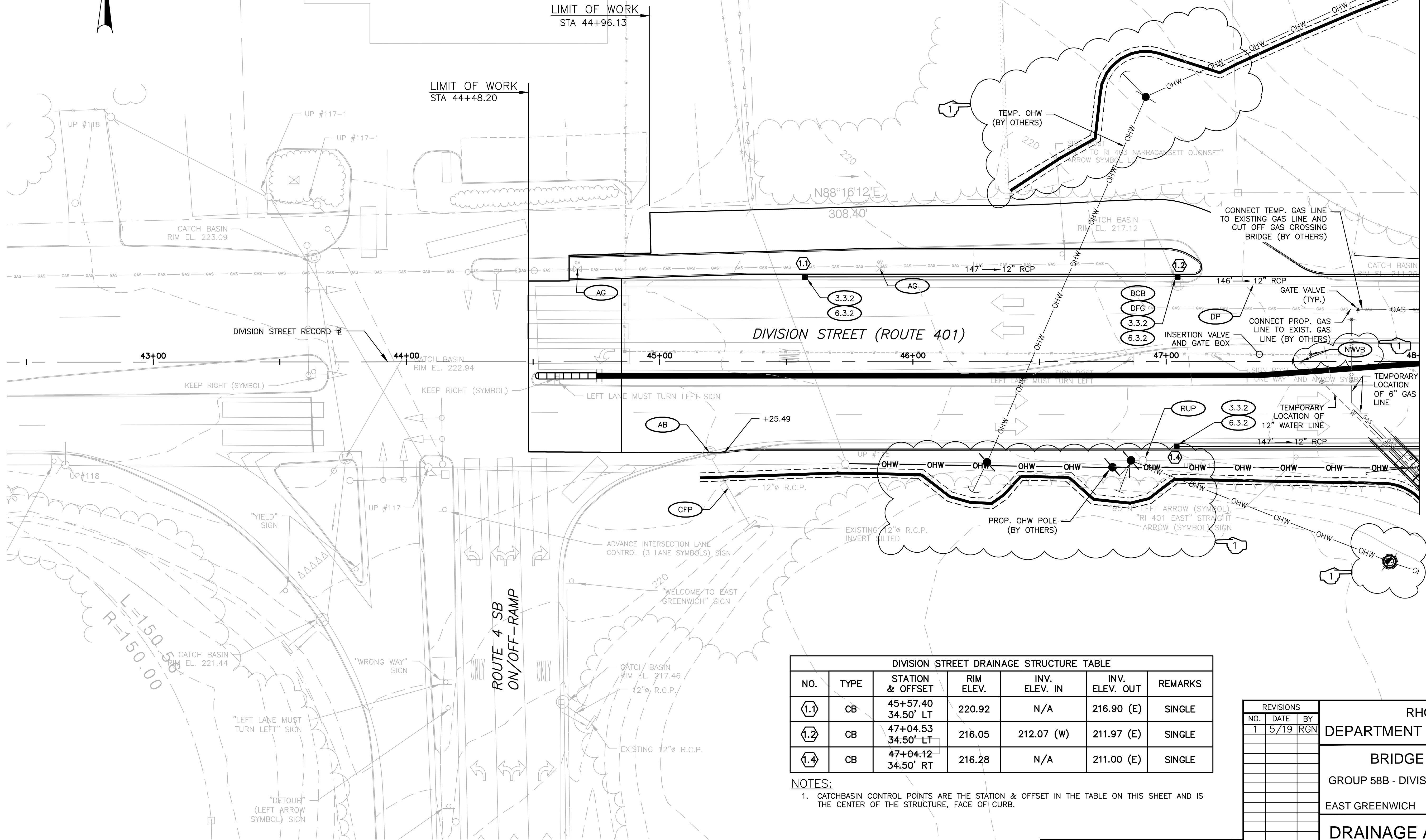
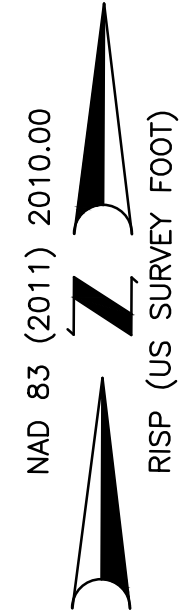
EAST GREENWICH RHODE ISLAND

GENERAL PLAN ROUTE 4

SHEET 4 OF 5

CHECKED BY KPD DATE 02/17/17 SCALE 1"=20'

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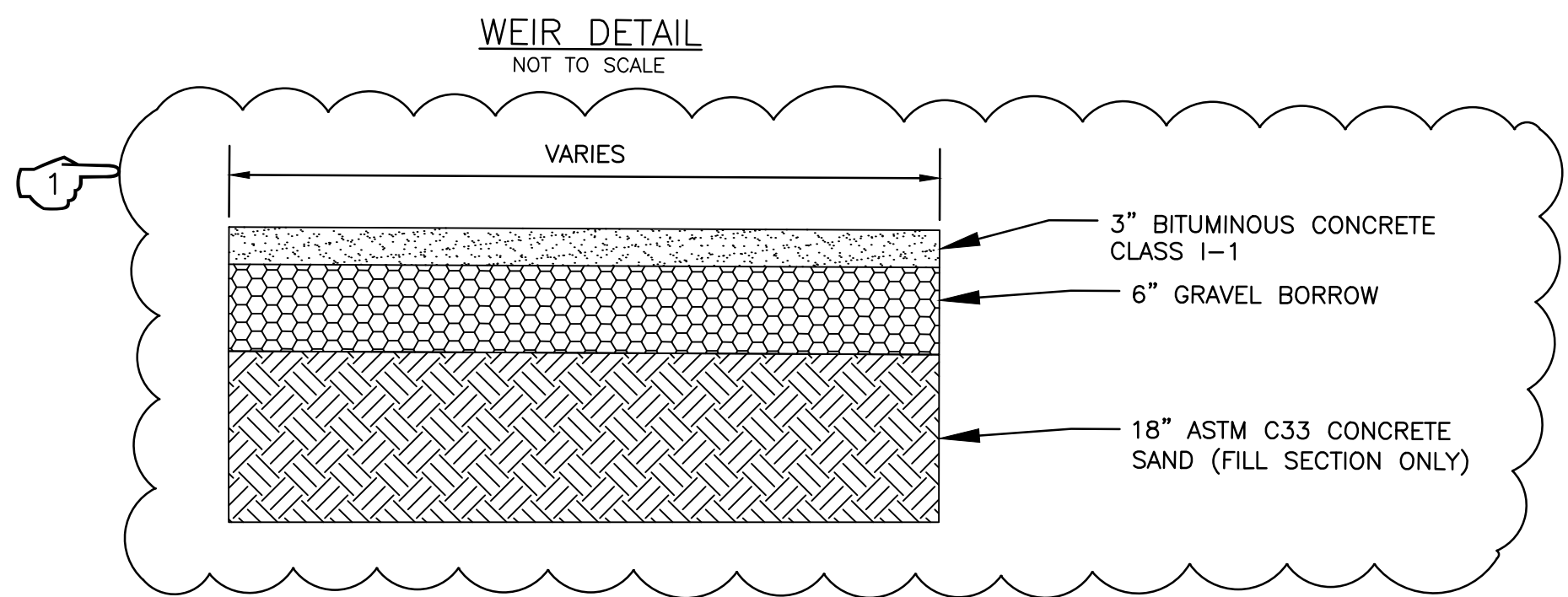
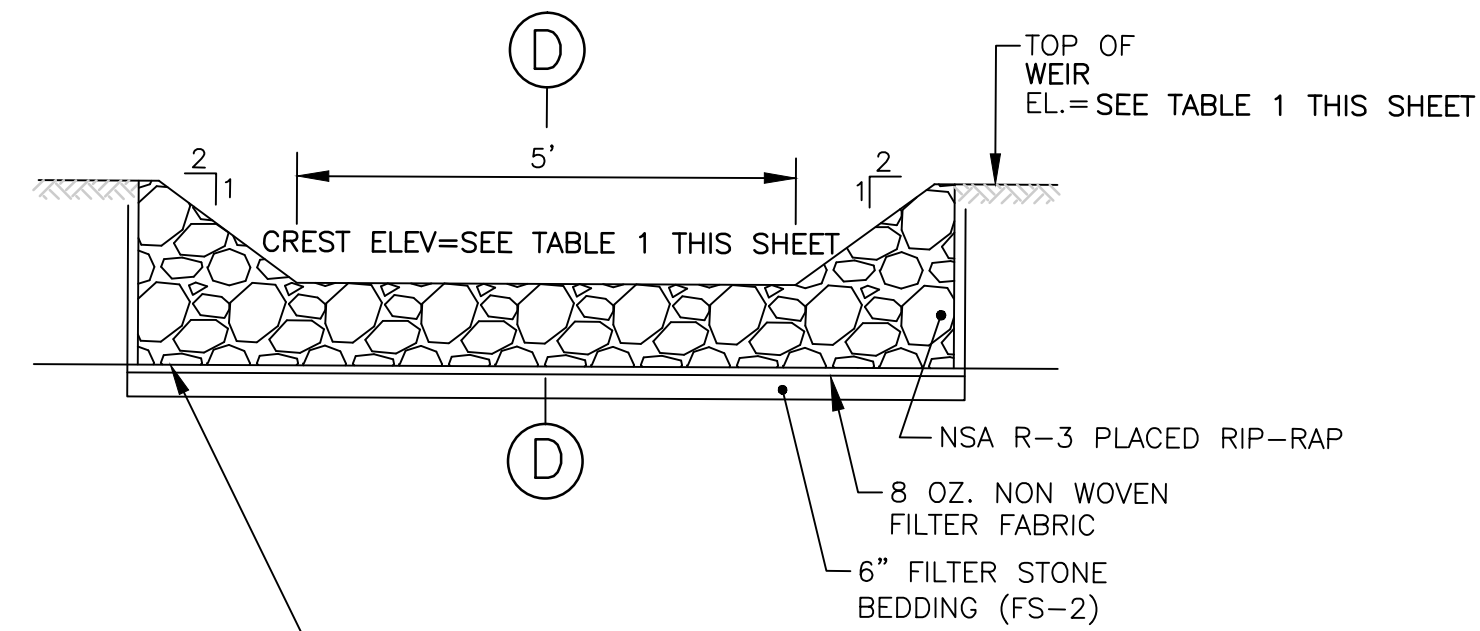
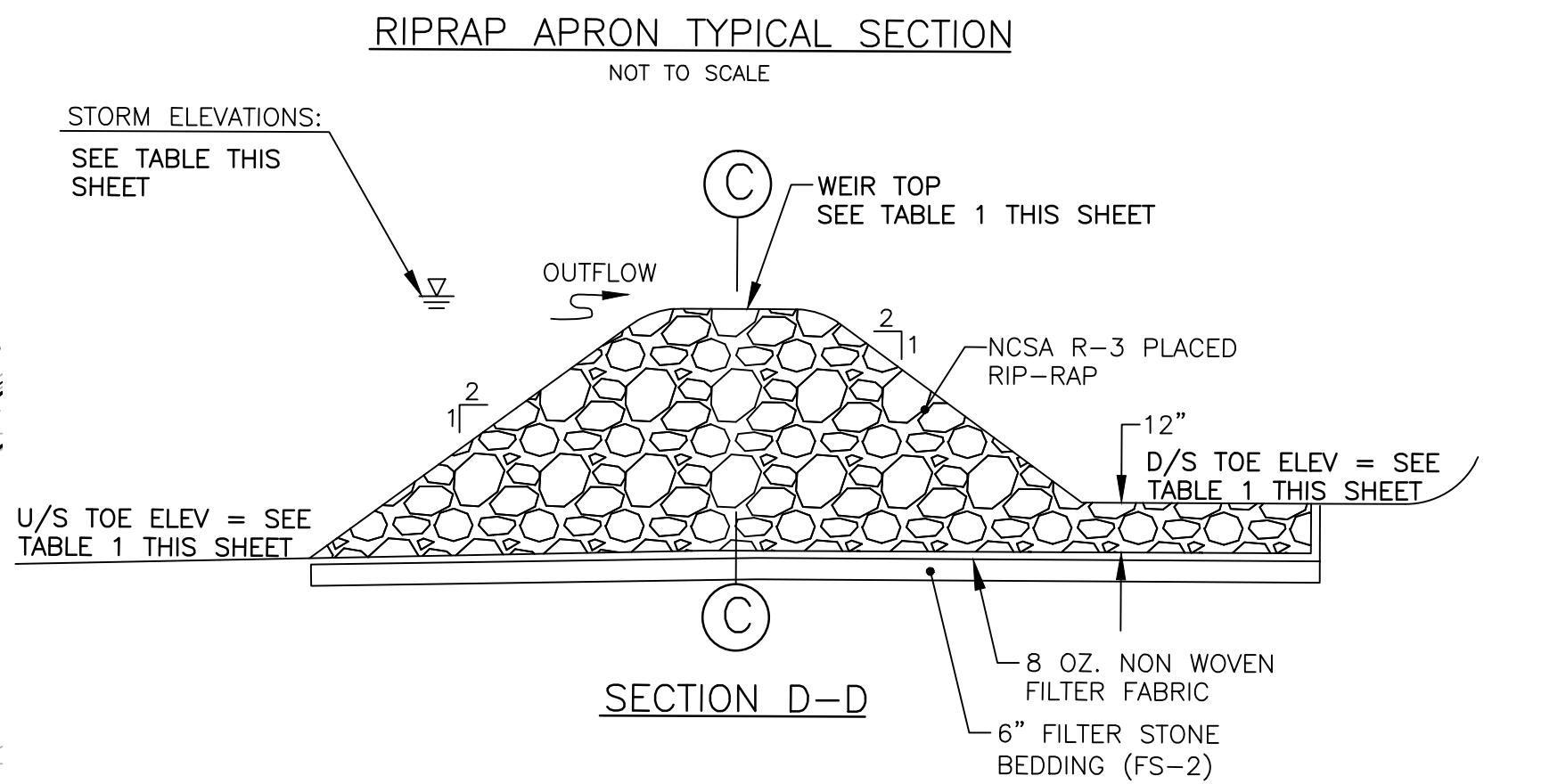
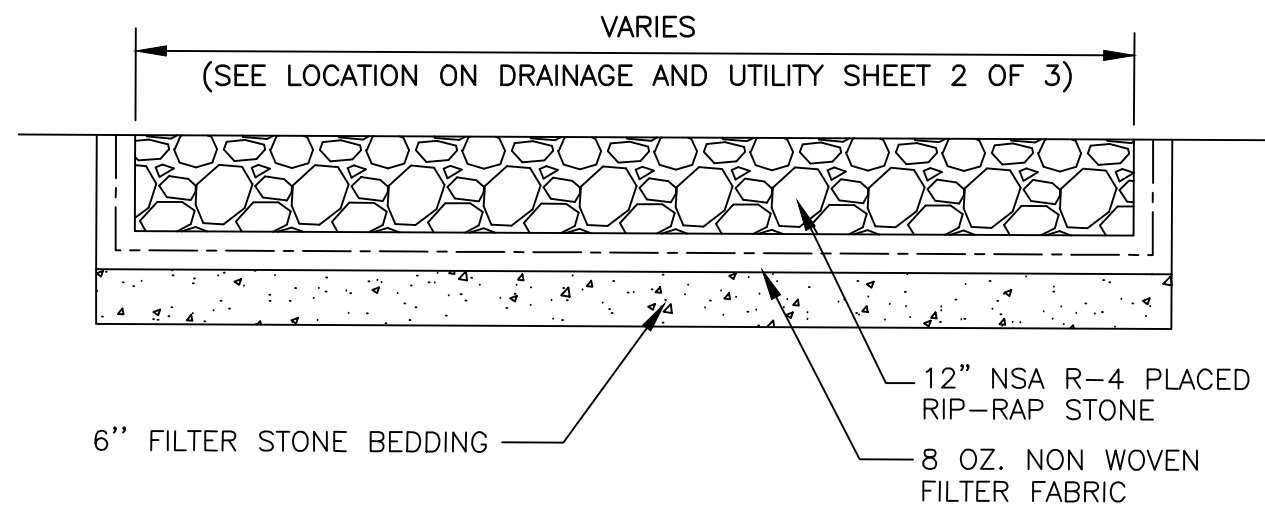
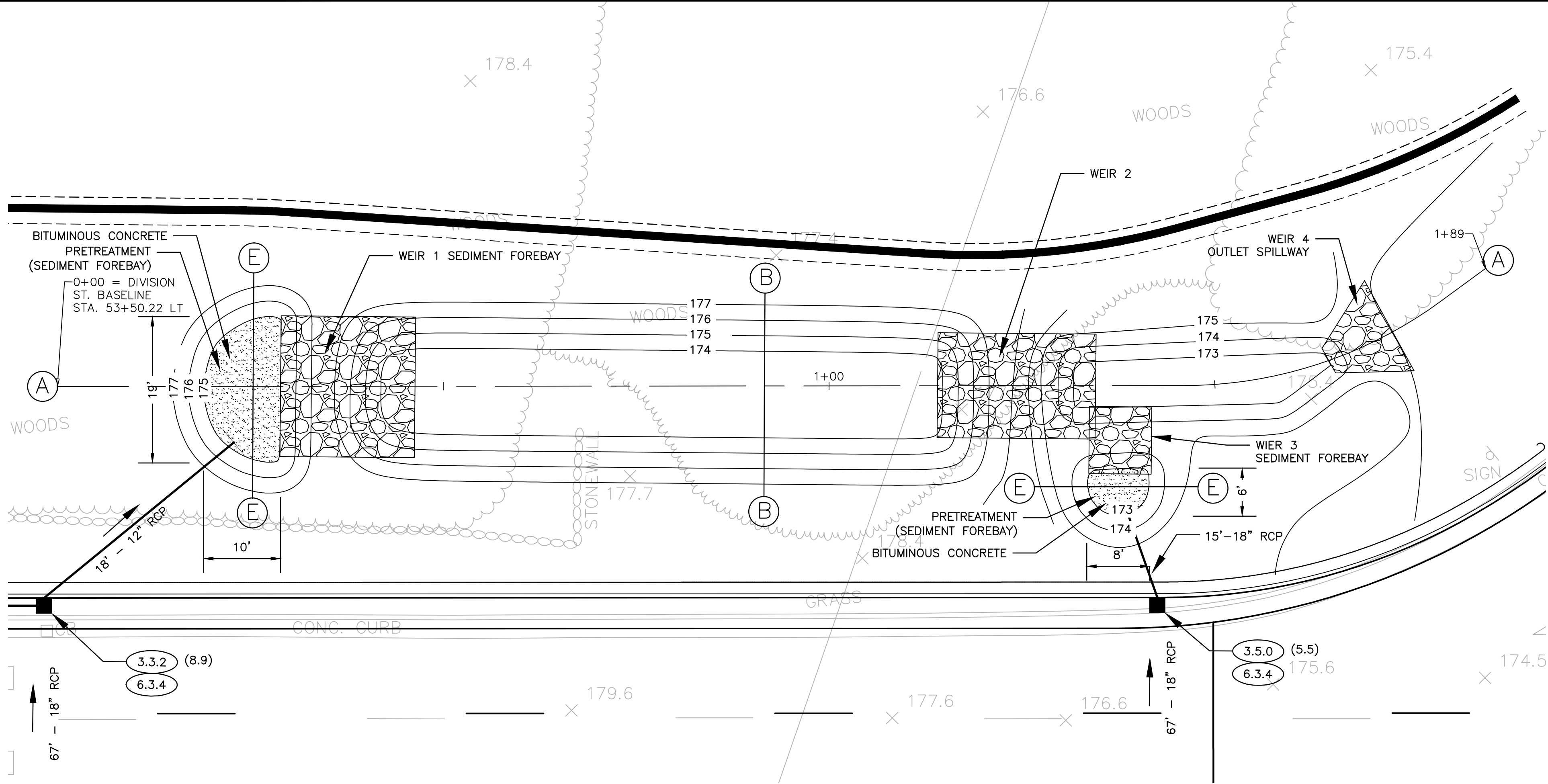


DIVISION STREET DRAINAGE STRUCTURE TABLE						
NO.	TYPE	STATION & OFFSET	RIM ELEV.	INV. ELEV. IN	INV. ELEV. OUT	REMARKS
1.1	CB	45+57.40 34.50' LT	220.92	N/A	216.90 (E)	SINGLE
1.2	CB	47+04.53 34.50' LT	216.05	212.07 (W)	211.97 (E)	SINGLE
1.4	CB	47+04.12 34.50' RT	216.28	N/A	211.00 (E)	SINGLE

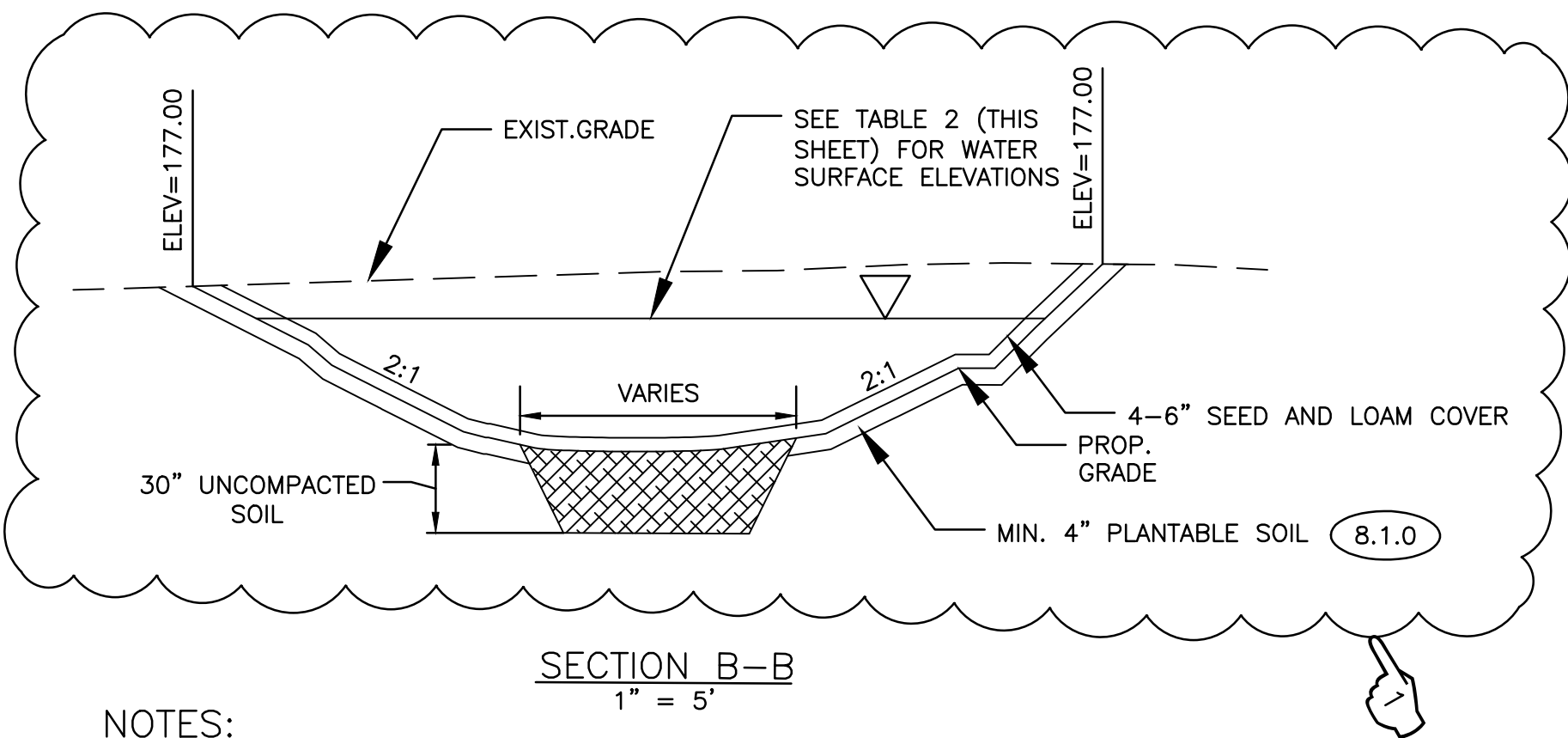
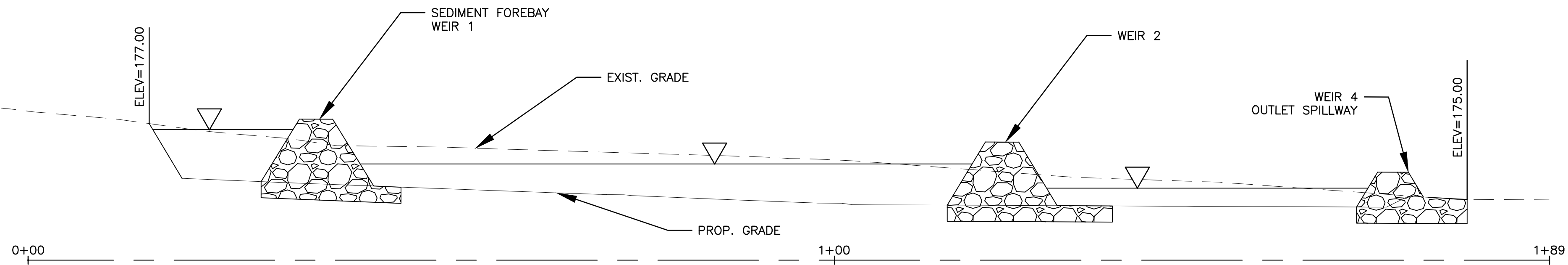
NOTES:
1. CATCHBASIN CONTROL POINTS ARE THE STATION & OFFSET IN THE TABLE ON THIS SHEET AND IS THE CENTER OF THE STRUCTURE, FACE OF CURB.



REVISIONS			RHODE ISLAND DEPARTMENT OF TRANSPORTATION	
NO.	DATE	BY	BRIDGE REPLACEMENT	
1	5/19	RGN	GROUP 58B - DIVISION STREET BRIDGE NO. 760	
			EAST GREENWICH RHODE ISLAND	
			DRAINAGE AND UTILITY PLAN	
			SHEET 1 OF 3	
			CHECKED BY <u>KPD</u> DATE <u>08/15/18</u> SCALE <u>1"=20'</u>	



SECTION E-E
TYPICAL SECTION OF PRETREATMENT (SEDIMENT FOREBAY) FLOOR
NOT TO SCALE



NOTES:
1. BOTTOM OF BASIN SHALL BE EXCAVATED TO 30" BELOW FINAL GRADE AND LOOSELY BACKFILLED WITHOUT COMPACTION.

ID	CREST ELEV.	U/S TOE ELEV.	D/S TOE ELEV.	TOP OF WEIR ELEV.	CREST LENGTH
WEIR - 1	178	176	174	179	10
WEIR - 2	177	174	173	178	10
WEIR - 3	174.5	173	173	175.5	4
WEIR - 4	174.5	173	174	175.5	10

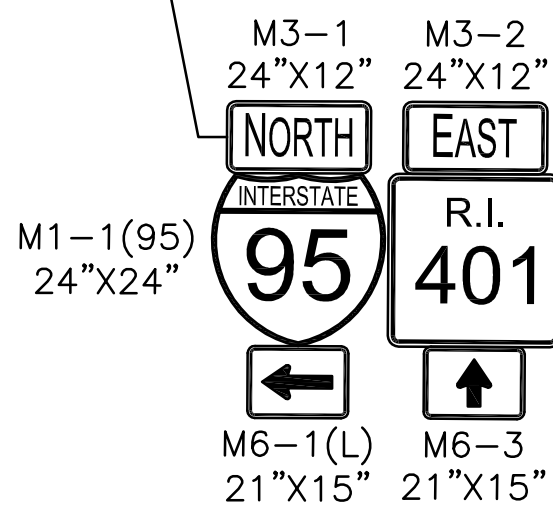
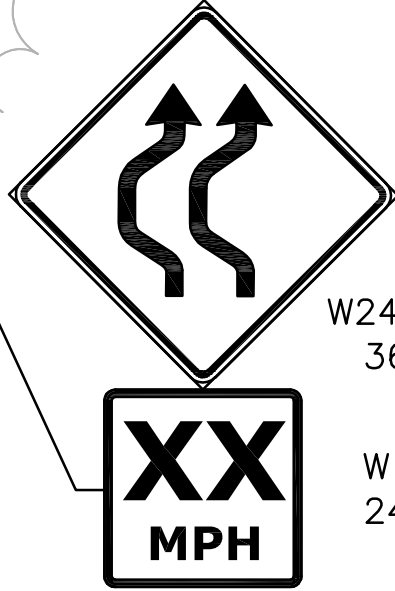
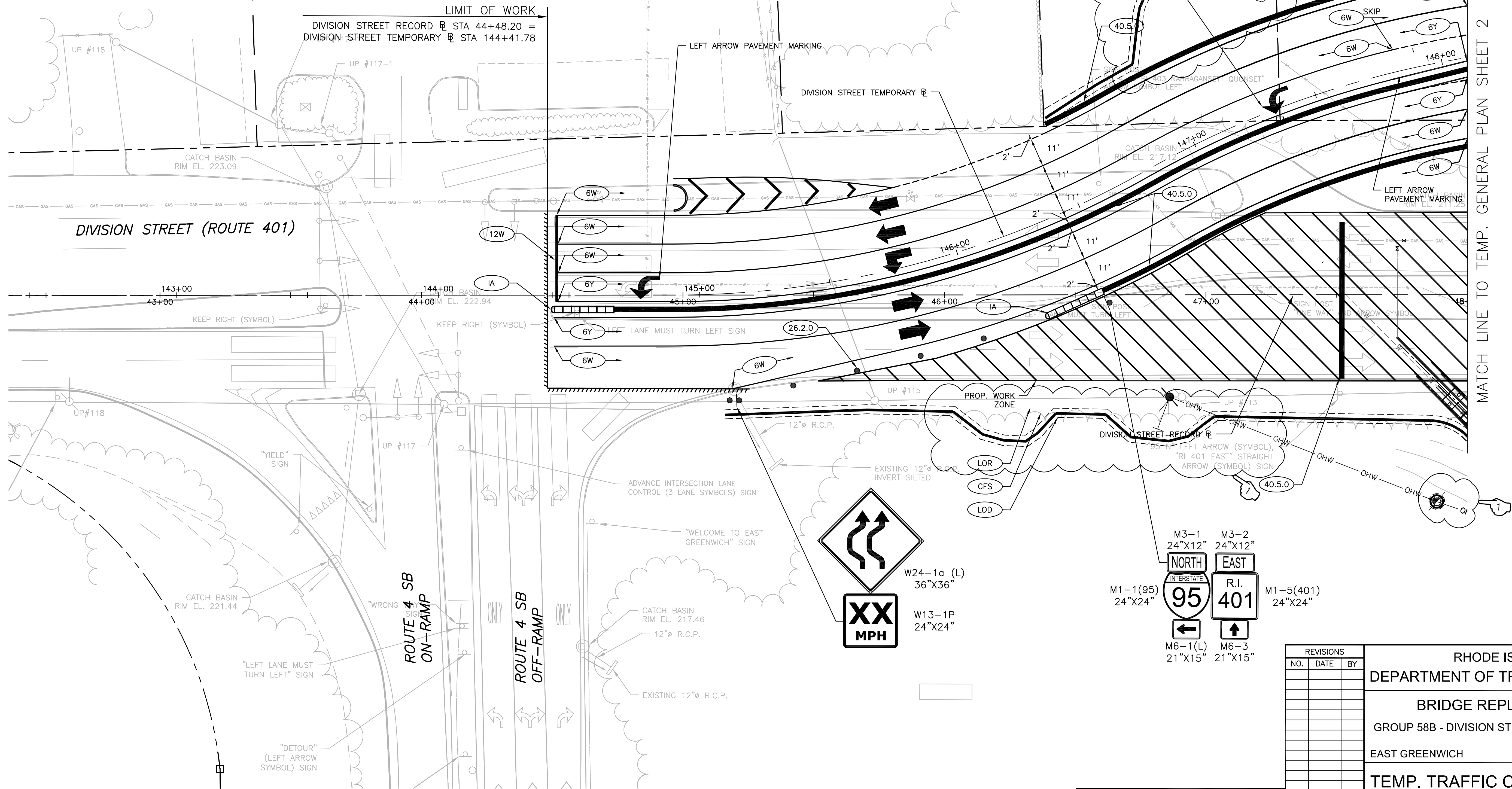
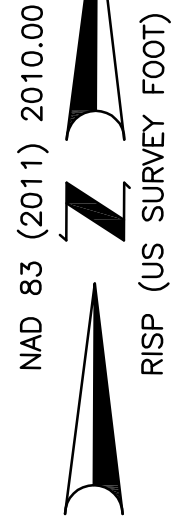
(SEE SECTION C-C AND D-D THIS SHEET)

STORM EVENT YEAR	WATER SURFACE ELEV.			
	SEDIMENT FOREBAY 1	BASIN 1	SEDIMENT FOREBAY 2	SPILLWAY
10	178.49	177.49	174.84	175.07
25	178.56	177.56	174.88	175.14
100	178.66	177.66	174.93	175.25

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REVISIONS			RHODE ISLAND DEPARTMENT OF TRANSPORTATION	
NO.	DATE	BY	BRIDGE REPLACEMENT	
1	5/19	RGN	GROUP 58B - DIVISION STREET BRIDGE NO. 760	
			EAST GREENWICH RHODE ISLAND	
			DETENTION BASIN DETAILS	
			SHEET 1 OF 1	
			CHECKED BY <u>KPD</u> DATE <u>08/31/18</u> SCALE <u>1"=10'</u>	

FED. ROAD DIV. NO.	STATE	FEDERAL AID PROJECT NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
1	RI	BRO-0760(003)	2018	37	134



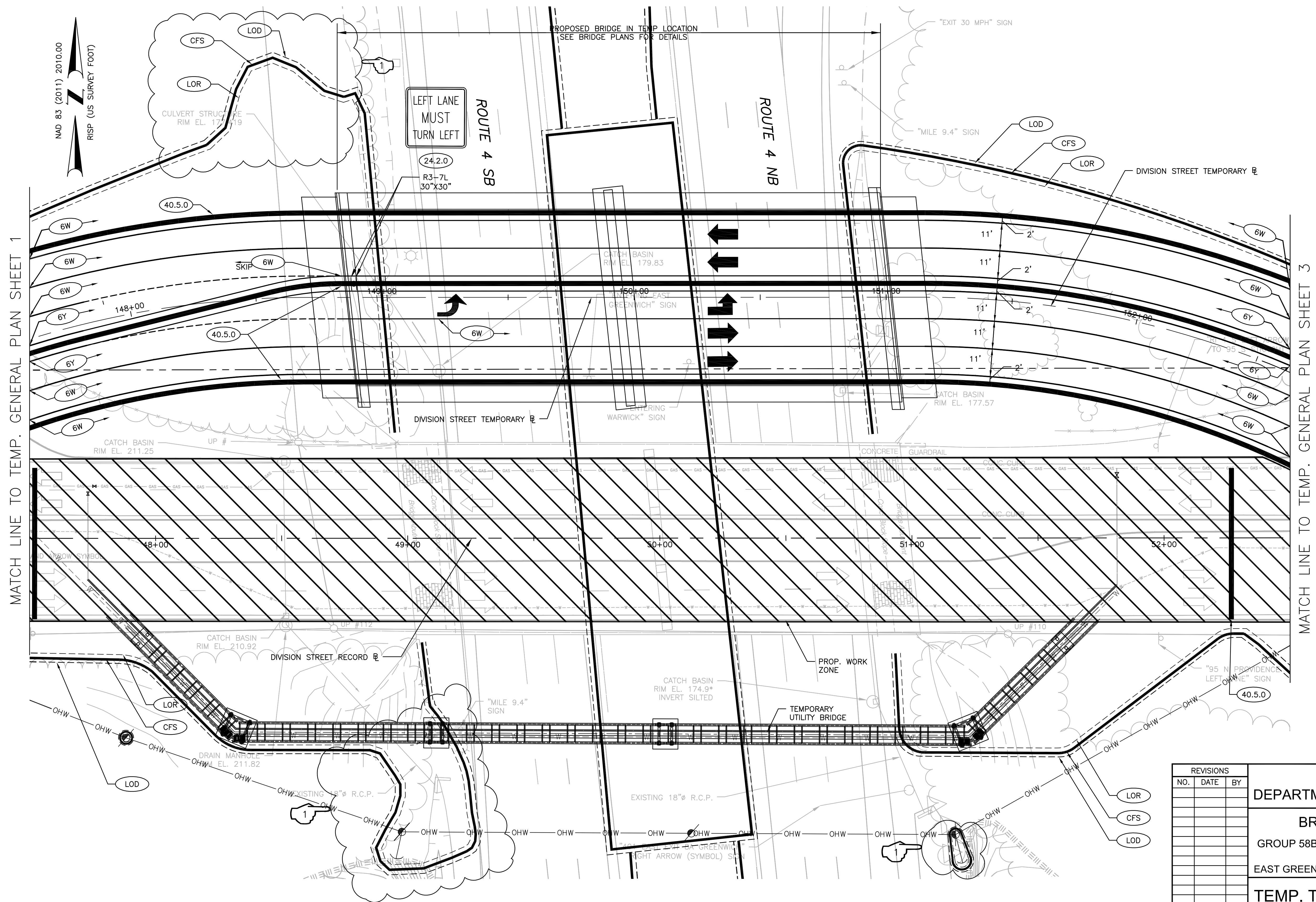
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REVISIONS		
NO.	DATE	BY

RHODE ISLAND DEPARTMENT OF TRANSPORTATION	
BRIDGE REPLACEMENT GROUP 58B - DIVISION STREET BRIDGE NO. 760	
EAST GREENWICH	RHODE ISLAND
TEMP. TRAFFIC CONTROL PLAN TEMPORARY GENERAL PLAN SHEET 1 OF 7	
CHECKED BY <u>KPD</u>	DATE <u>02/17/17</u> SCALE <u>1"=20'</u>

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FED. ROAD DIV. NO.	STATE	FEDERAL AID PROJECT NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
1	RI	BRO-0760(003)	2018	38	134

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RHODE ISLAND DEPARTMENT OF TRANSPORTATION

BRIDGE REPLACEMENT

GROUP 58B - DIVISION STREET BRIDGE NO. 760

EAST GREENWICH RHODE ISLAND

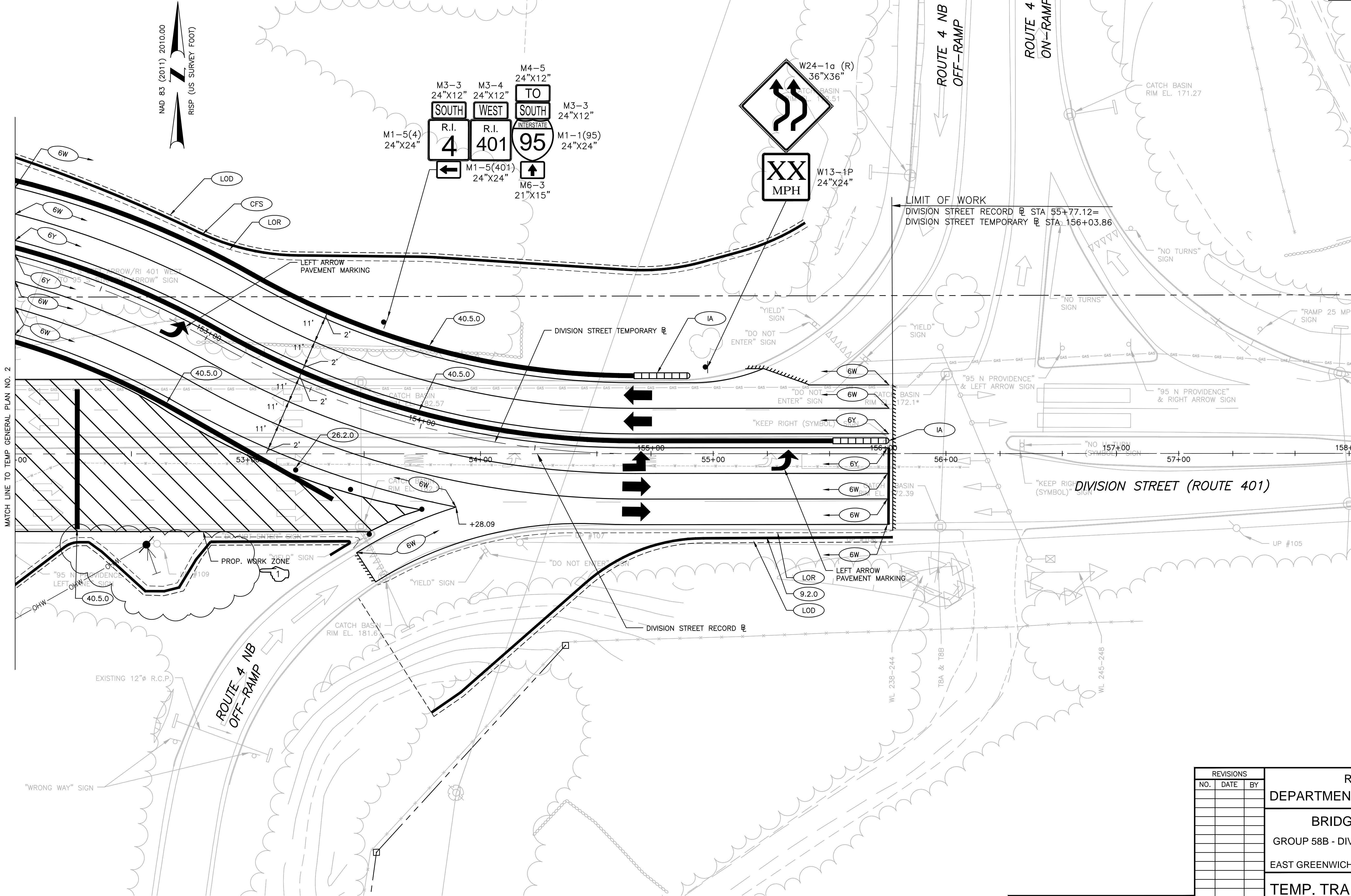
TEMP. TRAFFIC CONTROL PLAN

TEMPORARY GENERAL PLAN
SHEET 2 OF 7

CHECKED BY KPD DATE 02/17/17 SCALE 1"=20'

PARSONS
100 HIGH STREET, BOSTON, MA 02110
TEL: (617)946-9400 FAX: (617)946-9777

FED. ROAD DIV. NO.	STATE	FEDERAL AID PROJECT NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
1	RI	BR0-0760(003)	2018	39	134



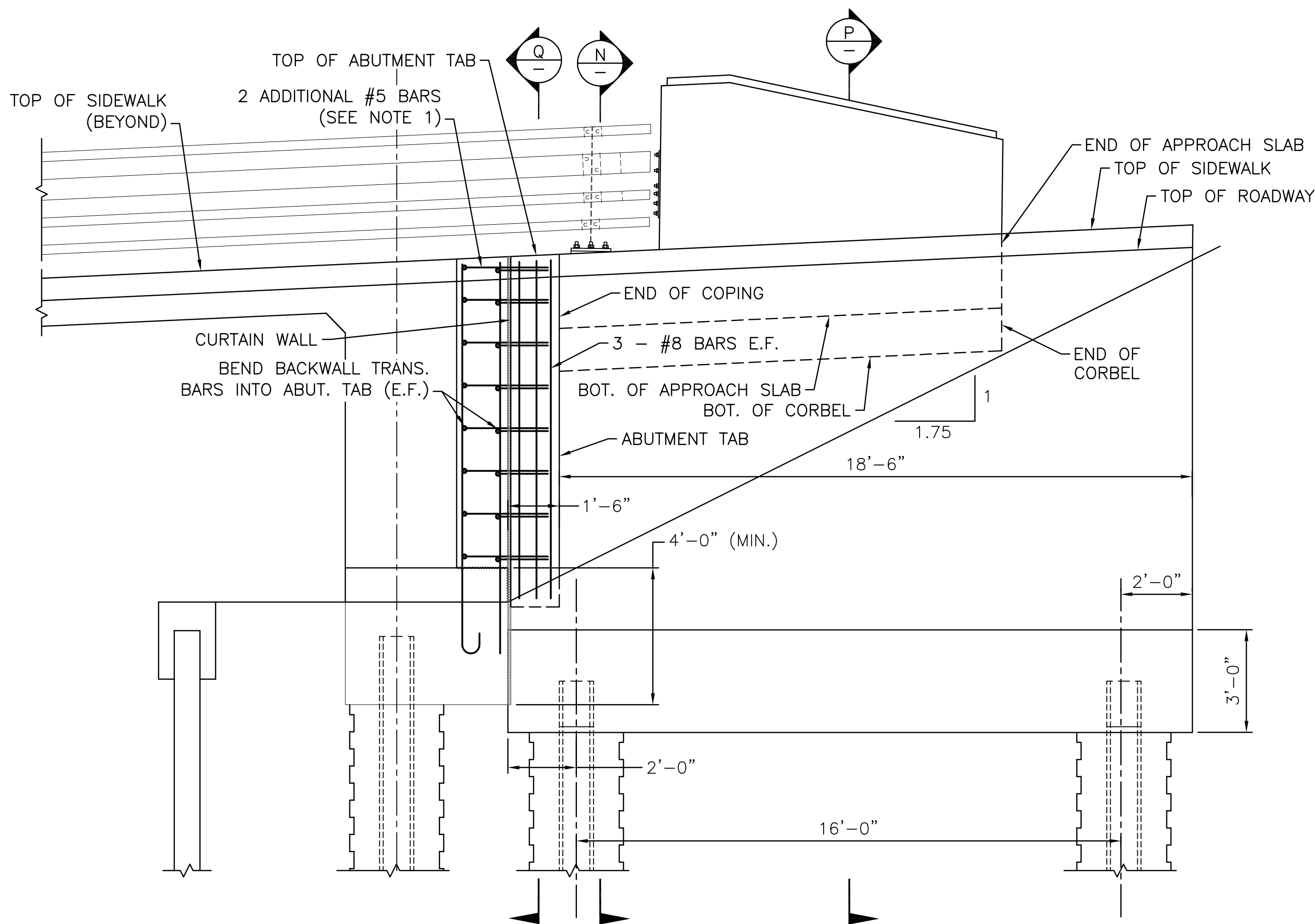
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FILE NAME: P:\RDOT\645238 - CBP Group 7 Bridges\Bridge760\CADD\Highway\Plans\0156D_V1_035-037_ITCP_GENERAL PLANS.dwg
DATE: 02/17/17
DESIGNER: HP 0359921 40203 HPB2.PDS

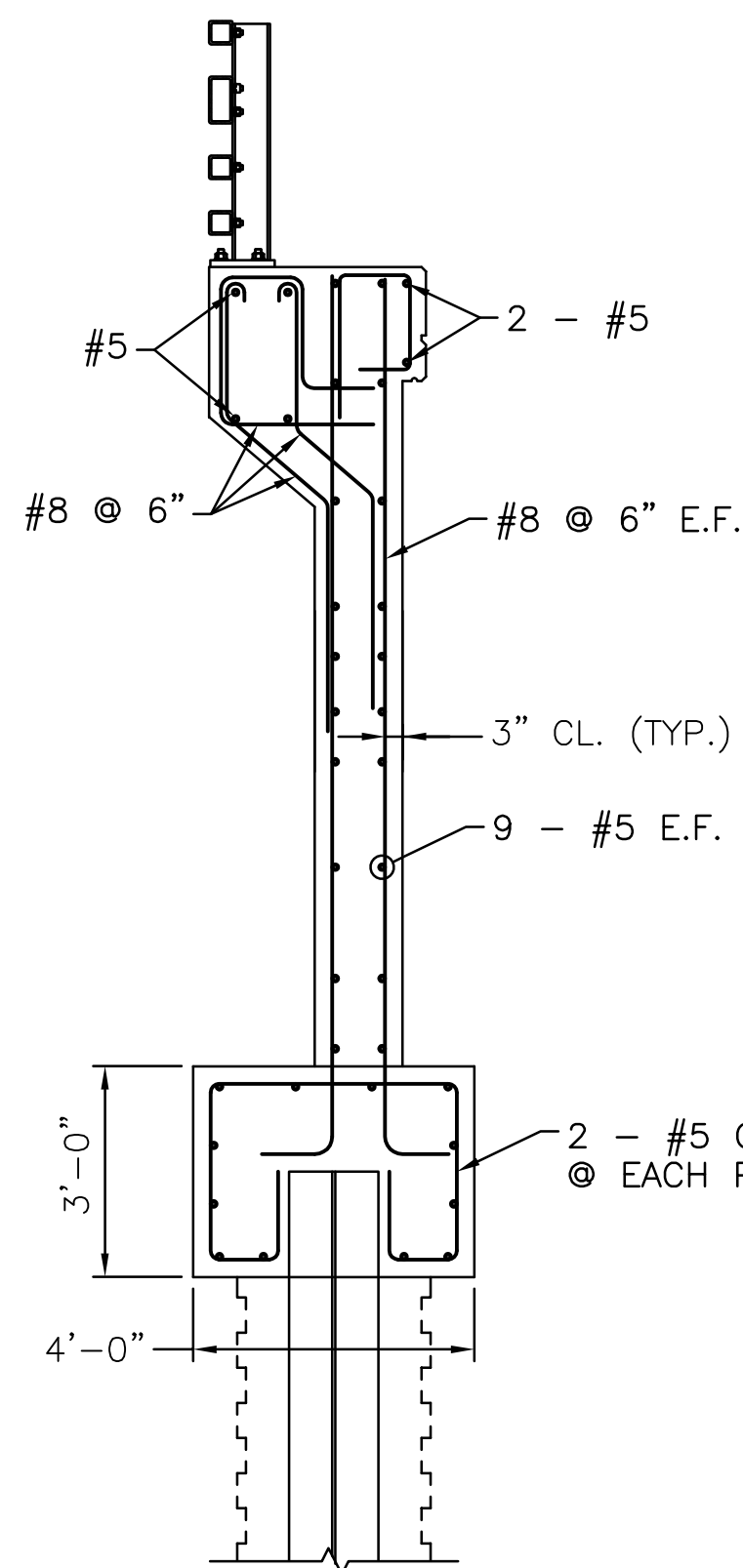
PARSONS
100 HIGH STREET, BOSTON, MA 02110
TEL: (617)946-9400 FAX: (617)946-9777

REVISIONS			RHODE ISLAND DEPARTMENT OF TRANSPORTATION	
NO.	DATE	BY		
			BRIDGE REPLACEMENT GROUP 58B - DIVISION STREET BRIDGE NO. 760	
			EAST GREENWICH RHODE ISLAND	
			TEMP. TRAFFIC CONTROL PLAN	
			TEMPORARY GENERAL PLAN SHEET 3 OF 7	
			CHECKED BY <u>KPD</u> DATE <u>02/17/17</u> SCALE <u>1"=20'</u>	

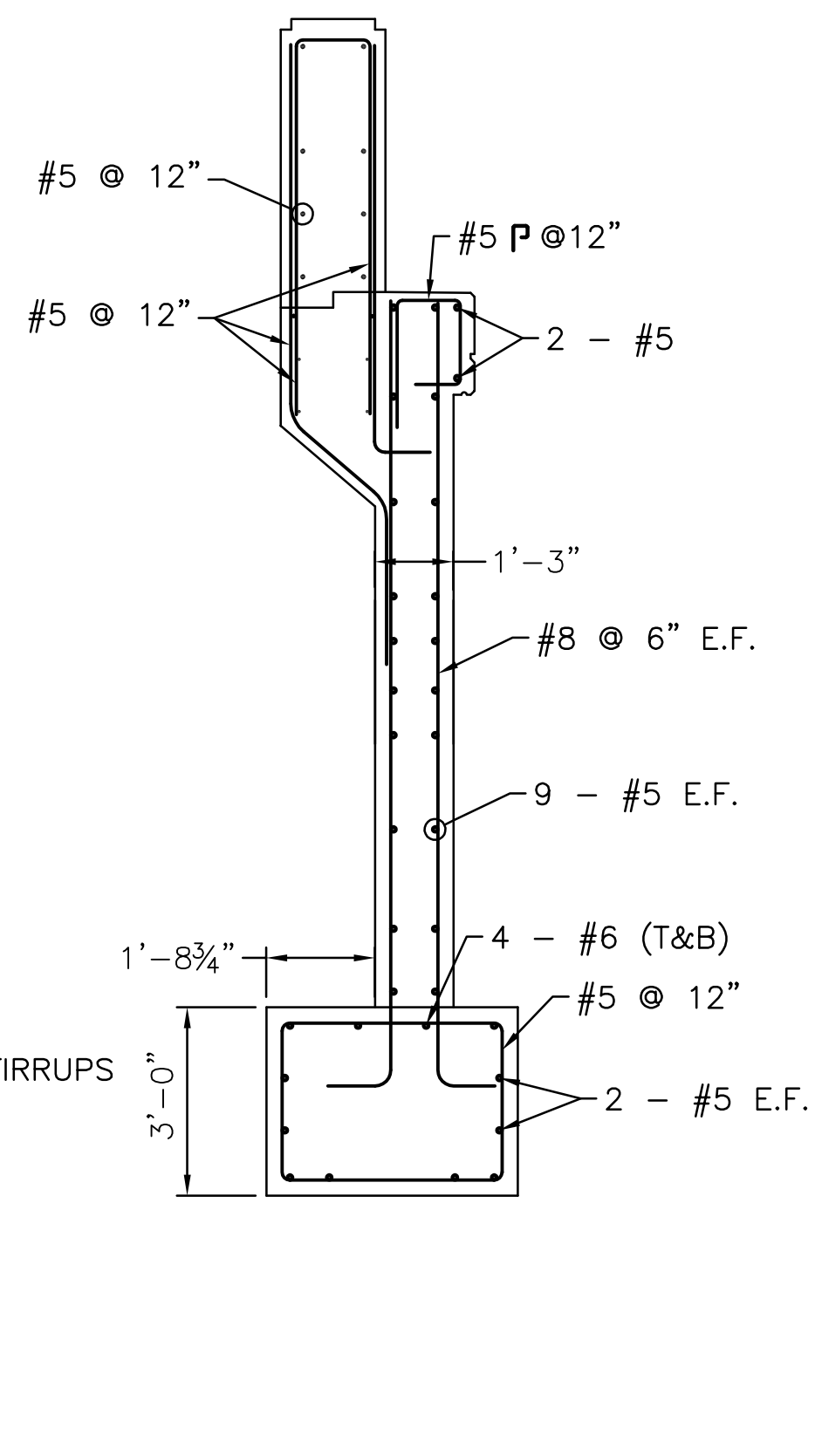
FED. ROAD DIV. NO.	STATE	FEDERAL AID PROJECT NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
1	RI	BRO-0760(003)	2018	104	134



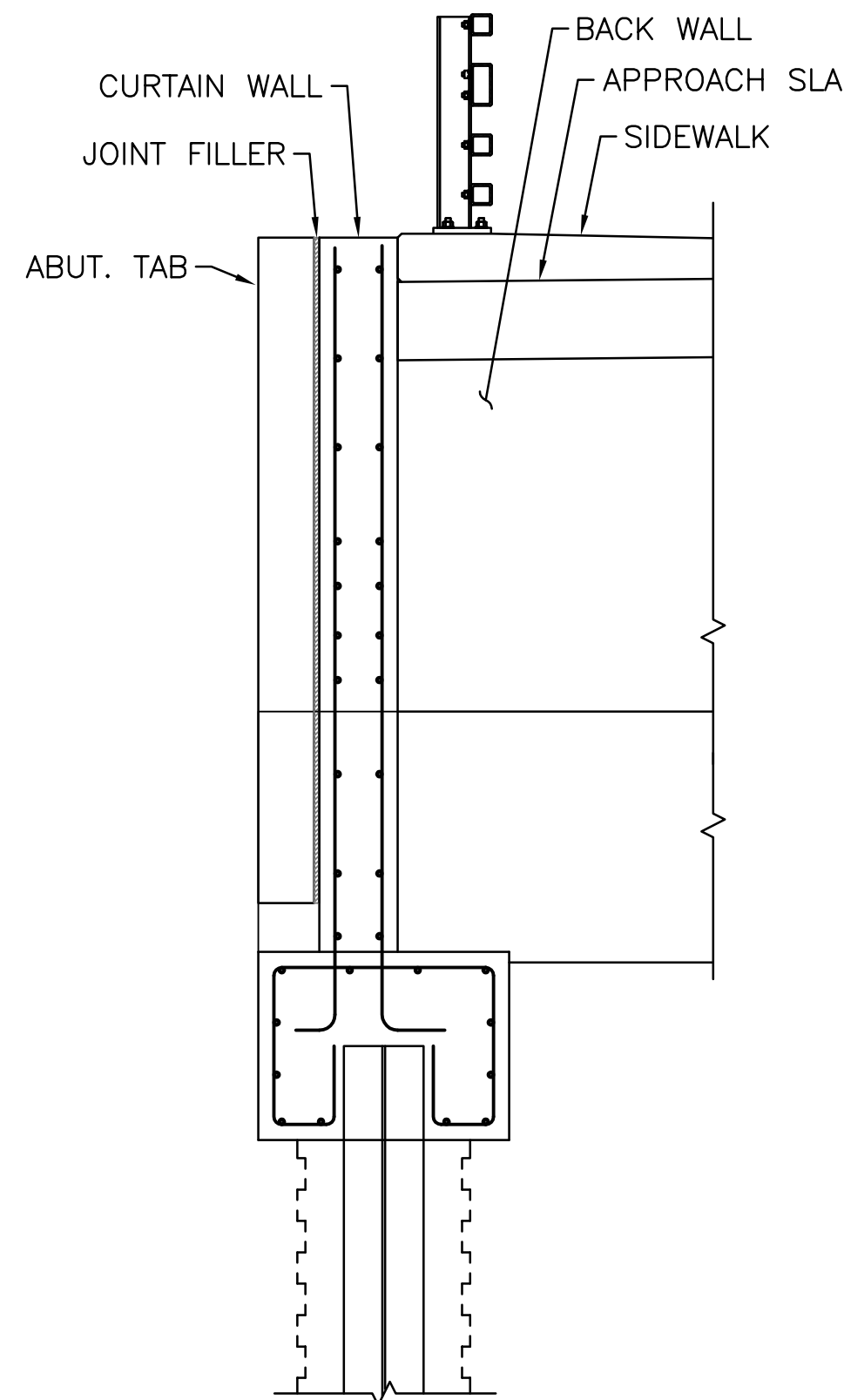
CURTAIN WALL ELEVATION
SCALE 3/8" = 1'-0"



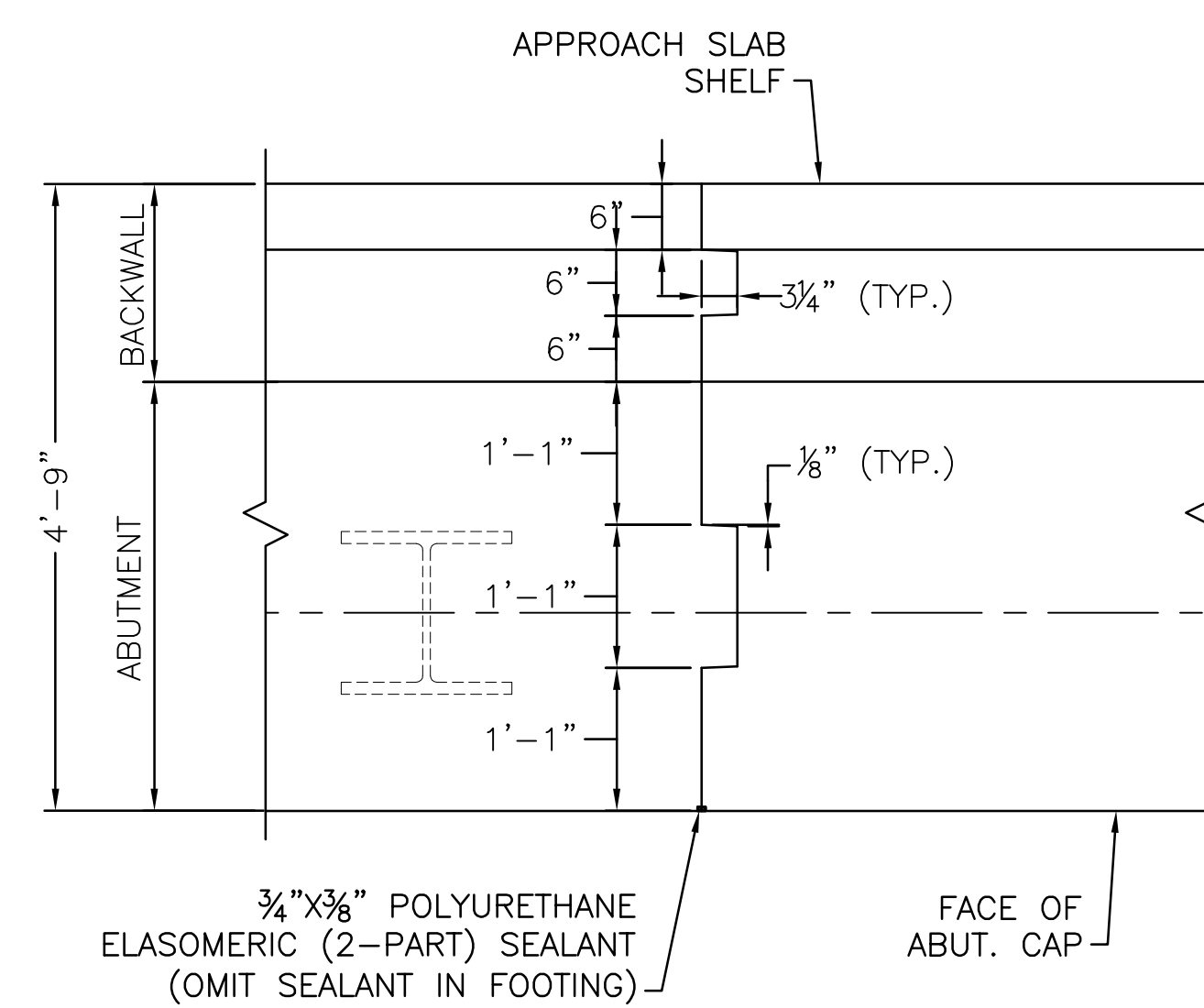
SECTION N
SCALE: 3/8" = 1'-0"



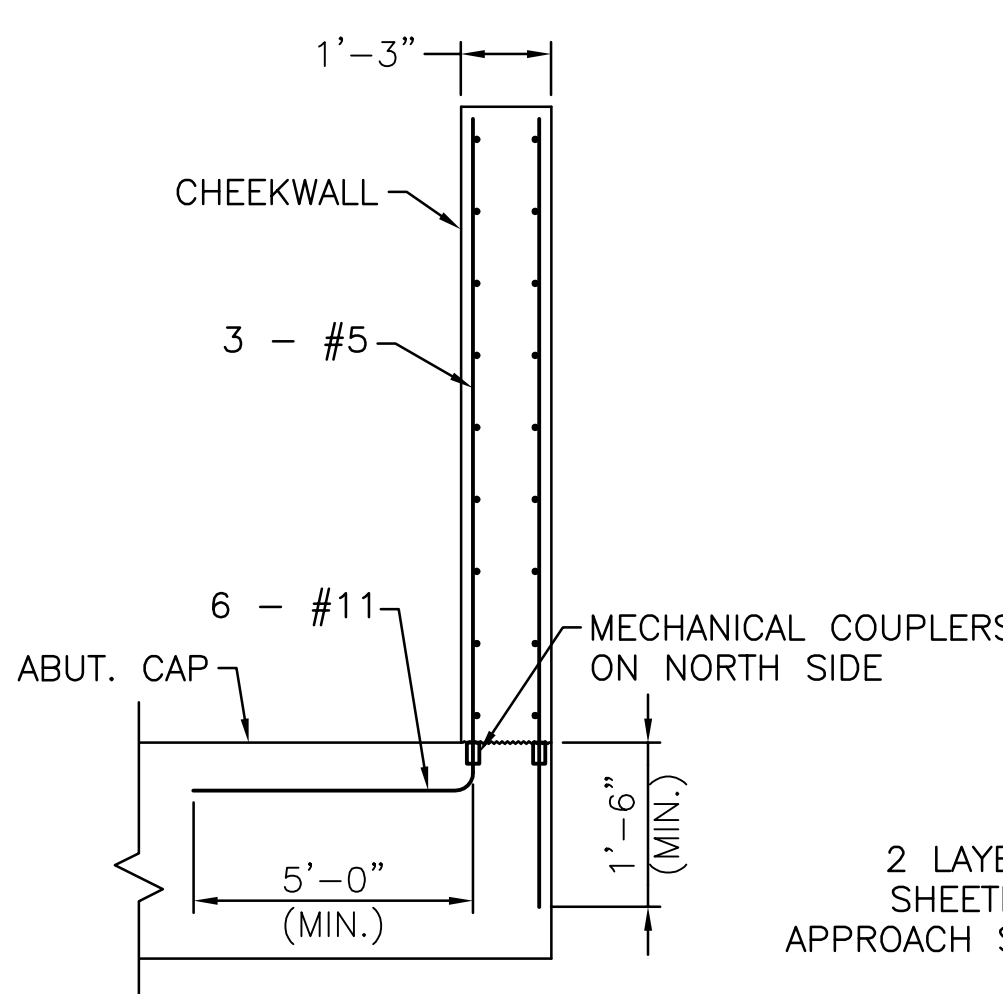
SECTION P
SCALE: 3/8" = 1'-0"



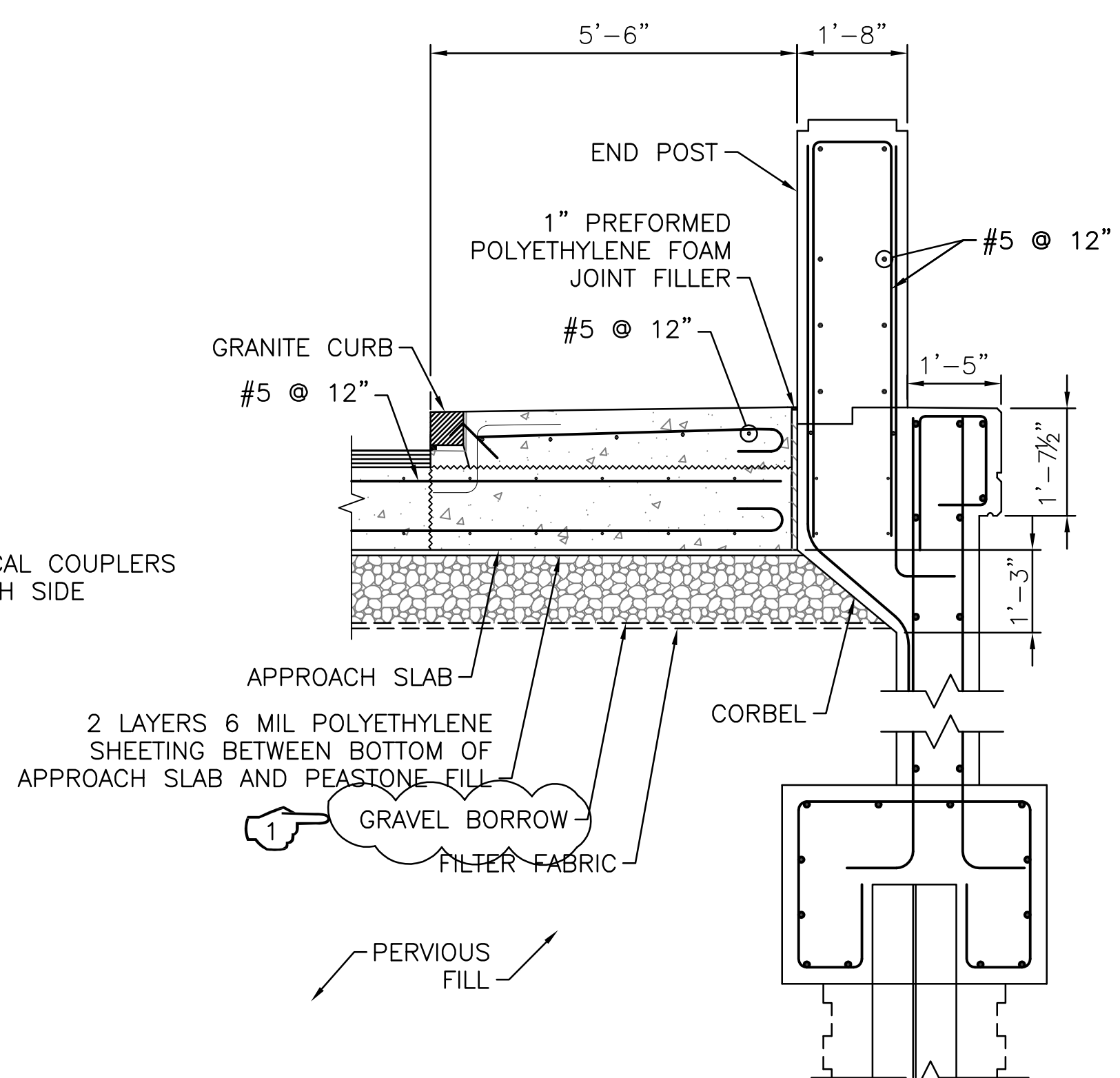
SECTION Q
SCALE: 3/8" = 1'-0"



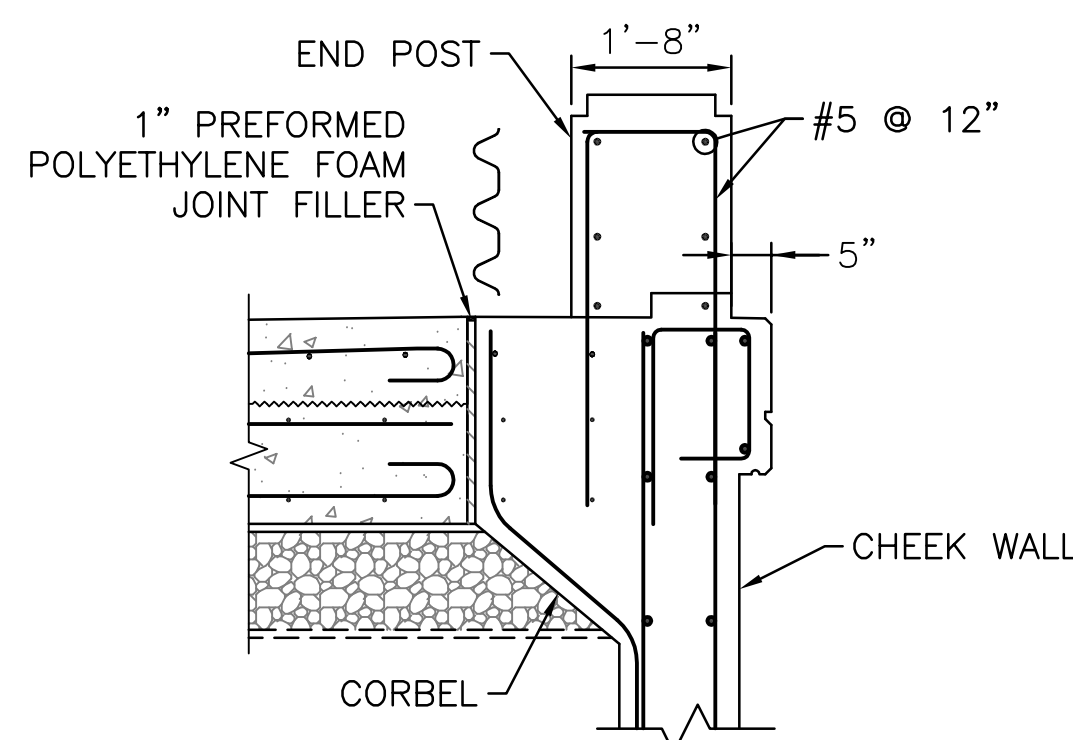
CONSTRUCTION JOINT DETAIL
SCALE 3/4" = 1'-0"



SECTION J
SCALE: 3/8" = 1'-0"



SECTION K
SCALE: 3/8" = 1'-0"



SECTION K1
SCALE: 3/8" = 1'-0"

- NOTES:**
1. BARS BEND FROM BACKWALL STEP SECTION INTO ABUTMENT TAB. BARS SHALL NOT EXTEND INTO APPROACH SLAB.

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REVISIONS			RHODE ISLAND DEPARTMENT OF TRANSPORTATION	
NO.	DATE	BY	BRIDGE REPLACEMENT	
1	5/19	RGN	GROUP 58B - DIVISION STREET BRIDGE NO. 760	
			EAST GREENWICH RHODE ISLAND	
			PROPOSED ABUTMENT DETAILS	
			(SHEET 3 OF 3)	
			CHECKED BY <u>RGN</u> DATE <u>8/18</u> SCALE <u>AS NOTED</u>	

GIRDER CAMBER TABLE (IN.)												
GIRDER NO.		EASTBOUND AND WESTBOUND OF BRIDGE										CL BRG. EAST ABUT.
		CL BRG. WEST ABUT.	.1L	.2L	.3L	.4L	.5L	.6L	.7L	.8L	.9L	
G-1 (WB) AND G-10 (EB)	Δs STEEL	0	0.5771	0.8045	0.6045	0.2003	0	0.2003	0.6045	0.8045	0.5771	0
	CONCRETE DECK	0	0.8455	1.1786	0.8854	0.2935	0	0.2935	0.8854	1.1786	0.8455	0
	COMPOSITE DEAD LOAD	0	0.1949	0.2741	0.2099	0.0728	0	0.0728	0.2099	0.2741	0.1949	0
	TOTAL	0	1.6175	2.2572	1.6998	0.5666	0	0.5666	1.6998	2.2572	1.6175	0
G-2 (WB) TO G-9 (EB)	Δs STEEL	0	0.5198	0.7246	0.5444	0.1804	0	0.1804	0.5444	0.7246	0.5198	0
	CONCRETE DECK	0	0.5295	0.7381	0.5545	0.1838	0	0.1838	0.5545	0.7381	0.5295	0
	COMPOSITE DEAD LOAD	0	0.1829	0.2573	0.1972	0.0686	0	0.0686	0.1972	0.2573	0.1829	0
	TOTAL	0	1.2322	1.7200	1.2961	0.4328	0	0.4328	1.2961	1.7200	1.2322	0

CAMBER TABLE

FILE NAME: P:\RIDOT\645238 - CBIP Group 7 Bridges\Bridge760\CADD\STRUCTURE\01560_V1_119A_STEELDET03.dwg
USER: jason
DATE: May 16, 2019 8:41:28 AM
DEVICE: DWG TO PDF PLOT

**PARSONS**
100 HIGH STREET, BOSTON, MA 02110
TEL: (617)946-9400 FAX: (617)946-9777

REVISIONS			RHODE ISLAND DEPARTMENT OF TRANSPORTATION	
NO.	DATE	BY		
1	5/19	RGN	BRIDGE REPLACEMENT GROUP 58B - DIVISION STREET BRIDGE NO. 760	
			EAST GREENWICH RHODE ISLAND	
			CAMBER TABLE	
			CHECKED BY <u> RGN </u> DATE <u> 5/19 </u> SCALE <u>AS NOTED</u>	

TMP ROLES AND RESPONSIBILITIES

TMP Development Managers

Project design managers who oversee the development of this TMP

RIDOT	CONSULTANT
Name: Kyle Gagnon	Name: Robert Niccoli
Title: Project Manager	Title: Project Manager
Unit: RIDOT	Company/Unit: Parsons
Office Phone: (401) 222-2053, Ext. 4671	Office Phone: (617) 449-1342
Mobile Phone:	Mobile Phone:
E-Mail: Kyle.Gagnon@DOT.RI.gov	E-Mail: robert.niccoli@Parsons.com

TMP Implementation Managers

Project construction managers with the primary responsibility & authority for implementation of this TMP

RIDOT	CONTRACTOR
Name: Victor Lepore	Name:
Title: Chief Compliance Inspector	Title:
Unit: Health & Safety	Company/Unit:
Office Phone:	Office Phone:
Mobile Phone:	Mobile Phone:
E-Mail:	E-Mail:

TMP Implementation Task Leaders

Other parties responsible for completing specific transportation management tasks required by this TMP

NAME / TITLE (if individual is named)	COMPANY / UNIT	PHONE	E-MAIL
	RIDOT / TMC	401-222-5826	tmc_operations@dot.ri.gov
Task Description / Responsibilities:	To be contacted via RIDOT notification form (FAX to 222-4225 / 222-5640) min. 48 hours prior to the implementation of lane closures and detours. Will update RIDOT 511 system as necessary.		
	RIDOT / Communications	401-222-1362	webmaster@dot.ri.gov
Task Description / Responsibilities:	To be contacted via RIDOT notification form (FAX to 222-3905) min. 48 hours prior to the implementation of lane closures and detours. Will update/issue RIDOT travel advisories web site / news releases as necessary.		
	RIDOT / Customer Service	401-222-2450	CustomerService@dot.ri.gov
Task Description / Responsibilities:	To be contacted via RIDOT notification form (FAX to 222-5648) min. 48 hours prior to the implementation of lane closures and detours. If necessary, will assist in coordinating the strategies included in the Public Information Plan.		
Task Description / Responsibilities:			

CHANGES TO TMP & CONTINGENCY PLANS

If at any time (1) a significant deviation from any of the strategies included in the TMP (e.g., the use of an alternate construction sequence) is desired by one or more members of the project implementation team, (2) field observations and/or data suggest that impacts to road users are or will be unacceptable, or (3) one or more performance requirements established in the TMP are not being met in the field, the RIDOT TMP Implementation Manager shall report the situation to his/her supervisor or Division/Section/Unit manager. The supervisor / manager will coordinate with the State Traffic Engineer, the Traffic Management Chief, the TMP Development and/or Implementation Manager(s), the Chief Engineer, and/or other interested parties as appropriate and/or necessary to consider and determine whether revised and/or alternate strategies should be implemented in an effort to lessen the adverse safety and/or mobility impacts of the project. If the supervisor / manager deems that strategy changes should be implemented, the changes shall be documented in a revised version of the TMP and the Traffic Management Chief, the State Traffic Engineer, and the Chief Engineer must approve of the revised TMP prior to their implementation.

If a significant deviation from any of the strategies included in the TMP is requested by the Contractor, unless directed otherwise by the RIDOT the Contractor is responsible for preparing and submitting to the RIDOT TMP Implementation Manager appropriate documentation (e.g., design calculations, analysis reports, Temporary Traffic Control Plans, etc.) showing that the requested change(s) are (1) feasible and (2) expected to result in safety and mobility impacts that are no more adverse than the impacts resulting from the strategies already included in the latest approved TMP. The RIDOT will review and consider the submittal(s) as described in the preceding paragraph and will determine whether the changes should be implemented. If the requested changes are approved by the RIDOT, unless otherwise directed by the RIDOT the Contractor shall prepare and submit to the RIDOT TMP Implementation Manager a revised version of the latest approved TMP in both printed and electronic (Microsoft® Excel) format that documents all of the approved changes. Work to implement the changes shall not begin until the Traffic Management Chief, the State Traffic Engineer, and the Chief Engineer have approved of the revised TMP.

When unexpected events (e.g., crashes, inclement weather, unforeseen traffic demands, etc.) occur in a project work zone where one or more lanes are closed, the RIDOT TMP Implementation Manager or his/her responsible designee should (1) determine whether or not the lane closure(s) can/should be removed in order to improve traffic operations and/or minimize delays and (2) if deemed appropriate, take action to remove the lane closure(s).

Project Specific Contingencies

TMP APPROVALS

All approvals must be obtained prior to start of work

ADMINISTRATOR OF PROJECT MANAGEMENT			STATE TRAFFIC ENGINEER			CHIEF ENGINEER		
Signature:			Signature:			Signature:		
Date: <u>5/9/19</u>			Date: <u>5-9-19</u>			Date: <u>5-9-19</u>		
Revision #	Initials	Date	Revision #	Initials	Date	Revision #	Initials	Date

		MINIMUM NUMBER OF LANES & SHOULDERS TO REMAIN OPEN TO TRAFFIC ^{1,2}							
		NON - ABC PERIOD							
Location	Time of Day		Day of Week						
	From	To	SUN	MON	TUES	WED	THURS	FRI	SAT
Division Street (Route 401)	0:00	6:00	ALL	1L	1L	1L	1L	1L	ALL
	6:00	9:00	1L	ALL	ALL	ALL	ALL	ALL	ALL
	9:00	15:00	ALL	ALL-S	ALL-S	ALL-S	ALL-S	ALL-S	ALL
	15:00	21:00	ALL	ALL	ALL	ALL	ALL	ALL	ALL
	21:00	0:00	1L	1L	1L	1L	1L	ALL	ALL
Route 4	0:00	6:00	ALL-S	1L	1L	1L	1L	1L	ALL-S
	6:00	9:00	1L	ALL-S	ALL-S	ALL-S	ALL-S	ALL-S	ALL-S
	9:00	15:00	ALL-S	ALL-S	ALL-S	ALL-S	ALL-S	ALL-S	ALL-S
	15:00	21:00	ALL-S	ALL-S	ALL-S	ALL-S	ALL-S	ALL-S	ALL-S
	21:00	0:00	1L	1L	1L	1L	1L	ALL-S	ALL-S
Division Street (Route 401) and Route 4 Rolling Roadblock and Full Closure	0:00	6:00	ALL	RR & FC	RR & FC	RR & FC	RR & FC	RR & FC	ALL
	6:00	23:00	ALL	ALL	ALL	ALL	ALL	ALL	ALL
	23:00	0:00	RR & FC	RR & FC	RR & FC	RR & FC	RR & FC	ALL	ALL

		MINIMUM NUMBER OF LANES & SHOULDERS TO REMAIN OPEN TO TRAFFIC ^{1,2,3}							
		ABC PERIOD							
Location	Time of Day		Day of Week						
	From	To	SUN	MON	TUES	WED	THURS	FRI	SAT
Division Street (Route 401)	0:00	6:00	DETOUR	DETOUR	1L	1L	1L	1L	DETOUR
	6:00	9:00	DETOUR	ALL	ALL	ALL	ALL	ALL	DETOUR
	9:00	15:00	DETOUR	ALL-S	ALL-S	ALL-S	ALL-S	ALL-S	DETOUR
	15:00	21:00	DETOUR	ALL	ALL	ALL	ALL	ALL	DETOUR
	21:00	0:00	DETOUR	1L	1L	1L	1L	DETOUR	DETOUR
ROUTE 4	0:00	6:00	DETOUR	1L	1L	1L	1L	1L	DETOUR
	6:00	9:00	DETOUR	ALL-S	ALL-S	ALL-S	ALL-S	ALL-S	DETOUR
	9:00	15:00	ALL-S	ALL-S	ALL-S	ALL-S	ALL-S	ALL-S	DETOUR
	15:00	21:00	ALL-S	ALL-S	ALL-S	ALL-S	ALL-S	ALL-S	DETOUR
	21:00	0:00	1L	1L	1L	1L	1L	DETOUR	DETOUR

LEGEND

ALL All travel lanes and shoulders shall remain open to traffic.

ALL-S All travel lanes shall remain open to traffic. Shoulders may be closed.

1L A minimum of one 11-foot wide travel lane shall remain open to traffic.

DETOUR All traffic lanes will be closed and detours will be in place

RR & FC Division Street (Route 401) and/or Route 4 NB and SB maybe closed temporarily. Maximum duration of each interval closure shall be 20 min. Only one closure per hour is permitted.

NOTES

- 1 The set-up and break-down of temporary traffic control devices within a traveled way or shoulder shall be construed as a closure of that traveled way or shoulder.
- 2 The provisions noted herein shall not free the Contractor from his responsibility to conduct all work in such a manner that assures the least possible obstruction to traffic.
- 3 ABC Period extends from 9PM on the Friday of the slide weekend until 6:00AM on Monday morning for Division Street and until 9:00AM on Sunday for Route 4 NB and SB

Appendix D – National Grid Gas Specifications

NATIONAL GRID

DOT REPLACEMENT OF DIVISION ST BRIDGE NO. 760

MAIN INSTALLATION ACROSS BRIDGE

EAST GREENWICH, RI

SECTION 100

JOB DESCRIPTION AND DESIGN SPECIFICS

April 28, 2019

101 JOB DESCRIPTION

101.1 Work within this project by the state appointed bridge contractor consists of:

101.11 Installation of (4) sections of 14-inch galvanized steel “sleeve” pipe cast within the bridge backwall sections, 11 feet total.

101.2 Work within this project by the bridge contractor’s appointed National Grid approved gas contractor consists of:

101.11 Installation of (2) sections of 10-inch galvanized steel “sleeve” pipe installed within the 14-inch steel backwall sections, 16 feet total.

101.21 Installation of approximately 230 feet of 6-inch steel pipe across the new bridge structure and through the 10-inch steel backwall sleeves, including (23) double roller supports with 220/240 casing insulators, casing spacers, link seals and casing end seals. Due to the type of bridge installation and phasing (2) additional 6-inch welds will be required.

101.22 Installation of an additional 200 feet of 6-inch plastic pipe within the roadway butting up with the existing main ends for tie-in.

101.23 Installation of approximately 70 feet of 6-inch plastic buried pipe including associated fittings and 460 feet of 6-inch steel pipe on a temporary utility bridge including associated weld fittings and (42) double roller supports with 220/240 casing insulators.

101.24 Installation of steel plate protection for all gas piping with less than 24 inches of cover in accordance with document CNST-6030.

101.25 Pressure testing the buried plastic and steel permanent bridge piping to 90 psig for a minimum of 1 hour in accordance with Section 106 and document CNST04003.

101.26 Pressure testing the buried plastic and steel temporary bridge piping to 90 psig for a minimum of 1 hour in accordance with Section 106 and document CNST04003.

101.27 Installation of cathodic protection consisting of the installation of (2) two-wire test stations each with (1) 17# anode on the steel bridge piping at the steel to plastic transition points on each bridge end as shown on the state gas design sheets.

101.28 Development of “as-built” drawings based upon the National Grid Location Plans.

101.3 All work included in this section shall be performed by the state appointed National Grid approved gas piping contractor.

101.4 Live gas tie-ins and cut-offs will be done exclusively by the National Grid.

101.5 National Grid reserves the right to make inspections of the work during the progress of installation and, where required, have all installation sequences performed in the presence of its inspector or authorized agent.

102 MATERIAL AVAILABILITY

102.1 All piping materials, including pipe, valves, fittings and appurtenances shall be provided by National Grid and shall not include padding sand and special backfill. Material shall be available at a designated National Grid location during normal working hours. Transportation to the job site, including loading and unloading, shall be performed by the contractor.

103 MATERIAL – SPECIFICATIONS – PIPE

103.1 Fourteen-Inch Steel Pipe: (Casing Pipe to be provided by National Grid and installed by Bridge Contractor)

103.11 Length Required: Approximately 11 feet

103.12 Specifications: API-5L, Grade B, PSL-2, HFW, bevel ends, double random lengths.

103.13 Wall Thickness - std wall(t): 0.375”

103.14 Pipe Coating: Galvanized

103.2 **Ten-Inch Steel Pipe: (Casing Pipe to be provided by National Grid and installed by Gas SubContractor)**

103.21 Length Required: Approximately 16 feet

103.22 Specifications: API-5L, Grade B, PSL-2, HFW, bevel ends, double random lengths.

103.23 Wall Thickness - std wall(t): 0.365"

103.24 Pipe Coating: Galvanized

103.3 **Six-Inch Steel Pipe: (Permanent & Temporary Gas Line Bridge Portion)**

103.31 Length Required: Approximately 230 feet permanent & 460 feet temporary

103.32 Specifications: API-5L, X-52, PSL-1, HFW, bevel ends, double random lengths.

103.33 Wall Thickness – std wall(t): 0.280"

103.34 Pipe Coating: Pritec 15/50

103.4 **Six-Inch Plastic Pipe: (Permanent & Temporary Gas Line Buried Portion)**

103.41 Length Required: Approximately 200 feet permanent & 70 feet temporary

103.42 Specifications: Performance Pipe Yellowstripe 8300, PE 4710/PE100, Polyethylene Pipe, 40-foot lengths.

103.43 Wall Thickness (t): 0.602" (DR 11.0)

103.44 Long Term Hydrostatic Strength (S): 1600 psi @ 73.4 degrees F

103.45 Maximum Operating Pressure $\frac{(2 \times S \times t \times 0.32)}{(D-t)} = \frac{(2 \times 1600 \times 0.602 \times 0.32)}{(6.625 - 0.602)} = 102 \text{ psig}^*$

- These values are limited to a maximum of 100 psig by DOT Code of Federal Regulations, Part 192, Title 49, Subpart C, Section 192.123.

103.5 **Two-Inch Plastic Pipe (Blow-off's):**

103.51 Length Required: Approximately 9 feet

103.52 Specifications: Performance Pipe Yellowstripe 8300, PE 4710/PE100, Polyethylene Pipe, 40-foot lengths.

103.53 Wall Thickness (t): 0.216" (DR 11.0)

103.54 Long Term Hydrostatic Strength (S): 1600 psi @ 73.4 degrees F

103.55 Maximum Operating Pressure $\frac{(2 \times S \times t \times 0.32)}{(D-t)} = \frac{(2 \times 1600 \times 0.216 \times 0.32)}{(2.375 - 0.216)} = 102 \text{ psig}^*$

- These values are limited to a maximum of 100 psig by DOT Code of Federal Regulations, Part 192, Title 49, Subpart C, Section 192.123.

104 OTHER MATERIAL

104.1 Weld Valves

104.11 None

104.2 Plastic Valves

104.21 (2) 6" Full Bore

104.3 Weld Fittings:

104.31 Elbow: (8) 6"x 45 degree

104.32 Transition Fitting: (4) 6"; (3) 2"

104.33 TDW Shortstop Fittings: (2) 4"; (2) 2"

104.4 Plastic Fittings

104.41 Cap: (6) 6"

104.42 Elbows: (3) 2"x 90 degree

104.43 Transition Fitting: See Weld Fittings

104.44 Tapping Tee: (3) 6"x 2"

104.5 Other:

105.51 (2) 10"x 14" CCI Casing End Seals Model ESC

(2) 6"x 10" CCI Casing End Seals Model ESC

(8) 10"x 14" CCI Casing Spacers

(6) 6"x 10" CCI Casing Spacers

(40) CCI WL-425-SS Wrap-It Links

(40) CCI WL-475-SS Wrap-It Links

(7) 558 Street Valve Box

(2) 17# Anodes

(23) 6" LB&A Double Roller Supports 304SS with 24" log rods & 4 extra nuts

(42) 6" LB&A Double Roller Supports HDG with 18" log rods & 4 extra nuts

(65) 6" Glasmesh 220/240 Casing Insulators

- (3) 2" weld x thread EH Nipple
- (3) 2" Meter Cock
- (3) 2" Steel Thread Plugs
- (16) 6"x 36"long Canusa Shrink Sleeves for above ground use
- 270' of No. 12 Tracing Wire & 6" Marking Tape

105 INSTALLATION OF MAIN

- 105.1 All plastic pipe installation work shall conform to the requirements of National Grid's Installation Specifications and Code Reconciliation: Section 200A, Installation of Polyethylene Gas Mains, Revised January 18, 1988.
- 105.2 All steel pipe installation work shall conform to the requirements of National Grid's Installation and Code Reconciliation: Section 200, Installation of Steel Gas Mains, Revised March 26, 1992 and Installation of Steel Distribution Mains CNST04005 and the RIDOT project plans.
- 105.3 The installation of the gas main across the bridge and within the roadway for both the temporary and permanent bridges shall conform to the RIDOT Division St Bridge Installation Plans and Details and to the National Grid Division St Bridge Installation Plans and Details.
- 105.4 Installations will terminate as close to the tie-in points as practical. Both tie-in locations must be aligned with the existing pipe when installed.
- 105.5 Any damage to the pipe or pipe coating should be immediately brought to the attention of National Grid construction department or the on-site inspector for inspection and, if necessary, repair or replacement.

106 PRESSURE TEST

- 106.1 Pressure test the steel bridge and plastic street main for both the temporary and permanent bridges to 90 psig for a minimum of 1 hour in accordance with National Grid document CNST04003—Pressure Testing Mains Operating Below 125psig.
- 106.2 Test Media: Compressed air, inert gas, or any combination thereof. The contractor shall provide the air compressor and/or inert gas for all required pressure testing.

**INSTALLATION SPECIFICATIONS
AND CODE RECONCILIATION
SECTION 200
INSTALLATION OF STEEL GAS MAIN
MARCH 21, 1975**

(Revised March 26, 1992 - See Revision List Page 8)

201 CONSTRUCTION SPECIFICS (FR 192.5, .303; ANSI 841.21)

201.01 All construction work performed by the Contractor shall be in accordance with the primary and supplemental publications of 49CFR 1921/; the ANSI Standard2/, B31.8-1968 Code; and National Grid Construction Specifications and Drawings. The Contractor shall also abide by the Terms and Conditions for General Construction. Any variation with, deletion from, or additions to the named references and the Project Drawings due to local conditions must originate from sound and specific reason. Arbitrary changes are not permitted. Remedial work required for noncompliance, unacceptable changes or additions, or acceptable changes or additions, where neither have received proper Company approval, will be at the Contractor's expense.

201.02 In the event specifics are detailed by both 49CFR 192 and ANSI B31.8, the more rigorous requirement shall control, unless specifically stated otherwise by the Company specifications.

201.03 All construction must meet the requirements of a Class 4 installation as defined by 49CFR 192 and as provided for by these specifications. All piping shall be designed for Design Hoop Stress levels of less than 20% of SMYS.

201.04 As used in this section "may" means "is permitted to" or "is authorized to," "may not" means "is not permitted to" or "is not authorized to," and "shall" is used in the mandatory and imperative sense.

202 GENERAL REQUIREMENTS (FR 192.305, .307; ANSI 841.221, .223, .271)

202.01 The Company has authority to enforce construction in accordance with Subsection 201, including the removal and replacement of any section of main that fails to meet the described standards.

- 1) The Federal Register, Volume 35, Number 161, Title 49 Part 192 (Under OPS, DOT) dated August 19, 1970 and effective November 1970, is designated as 49CFR 192. Specific paragraph references are preceded by FR to indicate source.
- 2) The ANSI Standard B31.8-1968 is designated as ANSI B31.8. Specific paragraph references are preceded by ANSI as to indicate source.
- 3) National Grid and its agents are designated as the Company.

202.02 Material Handling

202.02.1 Materials issued to the Contractor by the Company become his responsibility. The Contractor shall assume the responsibility of inventory and inspection before acceptance of materials. Methods of material transfer, handling, and storage are subject to the approval of the Company. Any material determined, by the sole determination of the Company, to be unsatisfactory for construction after acceptance by the Contractor, shall be repaired to the complete satisfaction of the Company, or replaced at the Contractor's expense. Any damage discovered previous to the Contractor's acceptance shall be replaced by the Company or repaired by the Contractor at a predetermined expense to the Company.

202.02.2 The hauling and stringing of pipe or other materials shall be performed in such manner as to prevent damage and to cause the least interference with the normal use of roadways or driveways. Gaps shall be left at intervals to permit passage of vehicles

and pedestrians. In the event transportation by rail or flatcar is involved, the provisions of API Standard RP5L1 shall apply.

202.02.3 Should it become necessary for the Contractor to store material, the Contractor shall do so at his expense and in a manner that will prevent damage from weather, vandalism, or other causes.

202.03 Primary material shall be provided by the Company. The Contractor shall provide all equipment necessary for installation of the facility as designated in Table 200-1, unless otherwise specified.

202.04 The Contractor shall provide all equipment necessary to test for gas tightness, structure integrity, and pigging as designated in Table 200-2, unless otherwise specified.

202.05 Permits for installation shall be provided by the Company. All permits for the transportation of pipe and other materials, and for construction procedures such as blasting shall be secured by the Contractor.

203 TRENCHING (FR 192.327; ANSI 841.16)

203.01 The route of the main shall be as shown on the plans. The specifications and drawings unless otherwise required by field conditions and specifically agreed to by the Company. The Contractor shall conduct his operations so that paving, driveway, and sidewalk cuts are bridged immediately after the trenching operation. Work shall be executed by the Contractor so that all fire hydrants and hydrant valves adjacent to the work area shall be readily accessible to fire-fighting apparatus. Under no conditions shall any materials or obstacles be placed within 15 feet of any fire hydrant or control valve unless by permit secured by the Contractor from the proper authorities.

203.02 All trenching operations shall conform to local Township, Town, City, State, or Federal specifications as required with regard to the overall length, width, and depth of the operation.

203.03 Trenching includes all excavation whether by trenching machine, power shovel, hand or other methods, which may be necessary for preparation of the pipe bed. The Company Specifications require a normal minimum cover of 44 inches. In no event shall depths less than 24 inches be allowed.

203.04 Payment for ledge removal by blasting or other means is limited to the specified dimensions of the trench plus an additional six inches (6") below the pipe for padding. Any ledge removal in excess, without the written approval of the Company, will be at the expense of the Contractor.

203.05 The normal width of the trench shall be the diameter of the pipe plus 14" unless otherwise required to meet minimum trench requirements, or as specified or agreed on in order to facilitate or expedite installation, or to improve the efficiency of construction so as to attain minimum cost of overall installation. Opening width may be increased as necessary for the installation of valves, fittings and appurtenances.

203.06 The minimum width of the trench shall be that which is necessary for the proper fabrication, installation, and padding or other protection of the pipeline and all materials and appurtenances associated with the system installation, unless otherwise specified by the Company.

203.07 A minimum clearance of three feet (3') shall be maintained between parallel runs, and a minimum clearance of six inches (6") shall be maintained at crossings of the Company main and a foreign structure, or shall be otherwise protected as specifically indicated by design detail. Where in-field conditions require variations with the above, the Design Engineer shall be consulted and methods of appropriate protection shall be in accordance with his specifications.

203.08 Pavement Cuts

203.08.1 Pavement shall be cut to the full trench width prior to excavation to provide a neat patch joint.

203.08.2 Where required by local governmental agencies, paving shall be cut six inches (6") wider than the trench in order to provide for a neat joint overlap on both sides unless one edge is adjacent to the curbing.

203.08.3 No payment for paving excavations wider than specified will be allowed unless specifically agreed to by the Company.

203.09 Surface materials must be kept separate from potential backfill material. The term "surface materials" includes asphalt, oiled sand, concrete, brick, paving stones, loam, and other surface substance which is dissimilar to the substrata materials of the trench excavation. Trenching includes removal and appropriate disposition of this material as the work progresses.

203.10 Care shall be taken in placing excavated material so that lawns and shrubs are not covered or damaged, and, if possible, streets and gutters are left unobstructed.

203.11 Excess excavated material that is acceptable for backfill shall be removed to a site satisfactory to the Company at the Contractor's expense.

203.12 Precautions shall be taken to avoid damage to any existing utilities. Proper support shall be provided before excavating below any utility line. However, when a utility line is accidentally damaged or broken, the Contractor shall immediately notify the authorities of the utility involve Contractor shall then cooperate and assist with immediate repair of damaged line, and in no case shall the trench be backfilled before approval by authorities of the involved utility is obtained.

203.13 Shoring will be provided in accordance with OSHA requirements, or where soil conditions are such that excessive widening of the trench occurs due to caving.

204 INSTALLATION

204.01 Welding or other joining procedure must be continuous from the point of origin to terminus and intermittent installations along the route of traverse is not permitted without special approval of the Design Engineer.

204.02 Due to difficulties encountered in support and alignment of "double joined" sections of double random lengths of pipe, the practice of double joining is not allowed.

204.03 All connecting points with the existing main must be aligned and spaced for connection to the existing main when installed in order that connecting segments may be true and continuous.

204.04 Adequate methods shall be employed to prevent the entrance of dirt or debris into the pipe during stringing and installation.

204.05 All pipe and associated equipment shall be inspected prior to installation but after stringing to insure that damage has not occurred to the hardware or protective coating during handling. The provisions of Subsection 202.02 apply to any damages discovered.

205 WELDING OF STEEL (FR 192.223, .225, .227, .229, 231, .235, .241,.243, .245; ANSI 821.3, 823.1, 824.1, 825.1, .2, 828.1, 841.22)

205.01 General

205.01.1 Welds and welding procedures must be qualified under API Standard 1104 and Subpart E of 49CFR 192.

205.01.2 All welders must be qualified under National Grid Safety Department Standards and FR 192.227.

205.01.3 The quality of field welds will be checked by either destructive or nondestructive inspection.

205.01.3.1 Nondestructive inspection shall consist of radiographic examination over the entire weld circumference, unless otherwise specified.

205.01.3.2 Destructive testing requires a field weld to be cut from the pipe as a cylinder and tested according to the requirements of API standard 1104.

205.01.4 The Contractor will cooperate with the Company during inspection of welded joints. The welds inspected will be selected at random by the Company. Inspected weld shall be identified and noted on the Foreman's Work Order. If a weld is nondestructively tested, the testing company will examine the welds and classify approval or rejection.

205.01.5 If there is any reason to believe that a field weld is defective after nondestructive testing and it cannot be repaired in accordance with FR 192.245, it shall be removed from the line with the cost for cutting and rewelding borne by the Contractor. The welder may be disqualified for further construction if deemed appropriate by the Company.

205.02 Testing and Inspection

205.02.1 Initial weld inspection for steel main

205.02.1.1 A testing company shall be employed by the Company, at its expense, unless otherwise specified, to nondestructively test by techniques described in Sub-section 205.01.3.1 all welds done by each welder during his first day on the job. A minimum of five (5) welds shall be tested during the testing period. Results of the test must be satisfactory and shall be reported to the project inspector and the Company Safety Department before proceeding with further construction.

205.02.1.2 The radiographic contractor must provide documentary evidence that the radiographer who interprets the film is a certified SNT-TC-1A Level 11 or Level 111 radiographer.

205.02.2 In addition to Subsection 205.02.1, the Company will inspect, at its expense, 10% of the project's welds. The specifications of Subsections 205.01.4 and 205.01.5 will apply.

205.03 Welding Specifics

205.03.1 A firm and positive grounding electrical connection must be established. Connecting apparatus equal to or exceeding the requirements of the Pipetron Quick-Bond Clamp is required, and jury-rig attachments such as homemade spring bars, etc., are disallowed.

205.03.2 Arc burns have been found to cause serious stress concentrations in pipe. The metallurgical notch caused by arc burns shall be prevented or eliminated in all mains. Arc burns resulting from faulty grounds and connections are not allowed and must be removed by cutting out the damaged portion of the pipe as a cylinder and replaced at the Contractor's expense. (See Subsection 209.)

205.03.3 It is suggested that grinding be given consideration after both the root and hot pass of welds in order to assure a clean field for subsequent welding. This practice may obviate an area of potential weld test failure.

205.03.4 The different wall thickness between pipe and fittings requires that the thicker wall be ground or the weld joint backwelded to avoid stress concentrations.

206 BENDS, ELBOWS, AND FITTINGS (FR 192.147, .149, .155, .313, .315; ANSI 831.21, .22, .23, .3, .4, .5, 841.23)

206.01 Flanges, Gaskets and Bolting

- 206.01.1** Steel pipeline flanges shall be manufactured in accordance with MSS Standard SP-44.
- 206.01.2** Flange connections between 150 psi steel and Class 125 cast iron flanges will be made with flat faced flanges, full faced gaskets, and allow steel bolts conforming to ASTM Specification A-193.
- 206.01.3** Flange connections between steel flanges will be made with raised face flanges, flat ring gaskets, and alloy steel bolts conforming to ASTM Specification A-193.
- 206.01.4** PSI products flange insulating gasket kits shall be used wherever points of isolation are specified in Section 900. Gasket kit specification is as follows: PSI Gasket Seal Type E with Phenolic Retainer and Nitrile (Buna N) Seal equipped with one piece sleeve and washers and steel washers. Alloy-steel bolts conforming to ASTM Specification A-193 with A-194 nuts shall be used in conjunction with raised face flanges when both are steel and with flat face flanges when one is steel and the other Class 125 cast iron.

206.02 Elbows and Bends

- 206.02.1** Miter bends shall be disallowed.
- 206.02.2** Elbows, reducers, tees, laterals, and other fittings shall be standard wall conforming with ASTM Speciation A-234, Grade WPB.
- 206.02.3** Field formed cold bends may be used for changes of direction less than 1-1/2 degrees per diameter length. They must be free from buckling, cracks, or other evidence of mechanical damage, and shall be formed with an appropriate die or shoe such that the deformation does not produce a difference between the maximum and minimum diameters in excess of 2.5% of the nominal diameter.
- 206.02.4** For greater changes in direction than that provided for in Subsection 206.02.3, factory-made wrought-steel welding elbows or transverse segments, cut there from shall be used. For tranverse segments, the arc length measured along the crotch shall be at least on inch (1") on pipe sizes two inches (2") and larger.

206.03 Branch Connections

- 206.03.1** Tees and branches for branch connections with d/Dratios greater than 1/3 and operating at less than 20% of SMYS, shall be fabricated with factory manufactured fittings having smooth configuration and manufactured in accordance with applicable codes. Where the complete fitting cannot be used, full encirclement fittings shall be provided in accordance with Figure 831-D of the ANSI B31.8.
- 206.03.2** Tees or laterals for branch connections or manifolds, with d/D ratios of less than 1/3 and operating at less than 20% of SMYS, may be field- or shop fabricated from pipe, if approved by the Design Engineer.
- 206.03.3** Thread-o-let and weld-o-let penetrations shall be clean cut holes for the full diameter of the connection.

207 SURFACE DAMAGE AND IMPERFECTIONS (FR 192.309)

- 207.01** Inspection for the detection of dents, gouges, and grooves shall be made prior to the pipe section being welded into the line, or just ahead of the backfilling operation. A dent is a depression which produces a gross disturbance in the curvature of the pipe wall without reducing the pipe wall thickness. A gouge or groove results where the metal of the pipe has been disrupted producing

minor changes in wall thickness and resulting points of stress concentrators.

- 207.02** A dent shall be removed where: it contains a stress concentrator such as a gouge, groove, or scratch; or if the dent results in a depression of more than 2% of the nominal pipe diameter, enclosed in an area of less than one pipe diameter in any direction. Gouges and grooves shall always be removed.
- 207.03** Dents requiring removal shall be removed by cutting out the damaged portion of the pipe as a cylinder, or shall be repaired by installing full encirclement reinforcing segments to completely lap the damaged area. Patching or coupon replacement is not permissible.
- 207.04** A gouge or groove shall be removed by smoothly grinding or sanding, provided that the remaining wall thickness is not less than that required by the pipe specification tolerances. Where the remaining wall thickness becomes less than the pipe specification tolerances, repair must be made by cutting out the damaged portion of the pipe as a cylinder. Patching or coupon replacement is not permitted.

208 INTERNAL CLEANING

- 208.01** Prior to the pressure test, each section of completed construction shall be "pigged" to remove any scale, dirt, or debris which may have been inadvertently entrained. Pigging shall be repeated until the exit air is free of traces of dust and dirt. The Contractor shall be responsible, at his expense, for locating and removing a trapped pig, and shall repair the main as may be necessary. It is recommended that a signaling device be incorporated in the pig for easy location. The pig used by the Contractor must be approved by the Company.
- 208.02** Care must be exercised during the pigging operation to prevent the pressure from exceeding the design pressure of the main.
- 208.03** The Contractor shall install a device to restrain and retain the pig upon exit from the main such that injury or damage to persons or property will be prevented. Any device judged unsuitable by the Company may be rejected.

209 PIPE TESTING (FR 192.507, .509, .619; ANSI 841.3, .42, .43, .44, .5, 845.22)

- 209.01** New mains shall be tested after construction and before being placed in operation to demonstrate gas tightness and structural integrity.
- 209.02** All steel welded main shall have a design operating pressure of 75 psig, be qualified for a Class 4 location as defined by the Register, and be tested to a minimum pressure of 150 psig, unless otherwise specified.
- 209.03** Testing procedure shall be by either standup static test or by direct inspection methods as designated in the Job Specifications.
 - 209.03.1** Standup static testing procedure shall require a minimum of 24 hours, after compression, for stabilization, and a static period of an additional 24 hours. The temperature and pressure shall be recorded immediately after the initial compression, after the 24-hour stabilization period, and after the 24-hour static test period. Pressures adjusted for temperature differential must remain static over the test period.
 - 209.03.2** Direct inspection testing procedure shall require that all welds and mechanical connections be soap tested by thoroughly soaping the area and determining that no leaks are evident. During the test, the soaped area must be thoroughly shielded from wind or other disturbances. A standup period, at the required test pressure, must be maintained for a minimum of one hour prior to initiation of the test.
 - 209.03.3** The pipe should be open and free to the test when possible.

- 209.04** The test medium shall be air, inert gas (N2 or CO2), or any combination thereof, unless otherwise specified.
- 209.05** Costs shall be borne by the Contractor for repair of defects disclosed by testing, and any further testing necessitated thereby, except that the Company shall assume responsibility for defects which are shown to be solely attributable to materials which the Company has supplied.
- 209.06** All temporary connections to the line shall be repaired to the satisfaction of the Company.

210 PADDING AND BACKFILL (FR 192.319; ANSI 841.273)

- 210.01** Backfill must be performed in a manner to provide firm support under the pipe. Care shall be used to prevent damage to the coating, by such means as the use of rock-shield material, or by making the initial fill with rock-free material to a sufficient depth over the main to prevent rock damage. (See Subsection 210.08)
- 210.02** Where it is indicated that soil conditions will be unstable, a clean backfill material must be provided around the pipe to provide continuous support along the section. (Clay soils can undergo severe volume changes resulting in soil plasticity with corresponding shifting and heaving producing increased secondary stresses on the pipeline.)
- 210.03** The Contractor shall provide all equipment necessary to place padding and backfill. Padding material shall be uniform natural bank sand, graded from all particles sizes smaller than the No. 10 sieve and coarser than a No. 200. Backfill material shall consist of natural bank gravel having durable particles graded from fine (greater than No. 200) to coarse (2-inch) in a reasonable uniform combination with no boulders or stones larger than 2-inch in size. Padding and backfill material must be free of lumps, frozen material, cinders, ash rubbish, paving material, clay, loam, rocks and any other material which might subject pipe, associated equipment, or coating, to injury. All padding and backfilled material must meet the approval of the Company. All wood used for blocking or shoring must be removed from the trench prior to the backfill operation.
- 210.04** Where suitable material, approved by the Company, for either padding or backfill is available along the line of traverse, the Contractor shall haul and place such fill under the contract price without extra cost. Where suitable fill is not available from excavated materials, by the sole determination of the Company, the Contractor shall procure, haul, and place suitable gravel to the satisfaction of the Company.
- 210.05** The Contractor shall submit a unit price for gravel fill, purchased, hauled, and placed, and shall be entitled to payment determined as the product of said price quotation and placed quantities only when such quantities are appropriately measured or otherwise accounted for at delivery and approved by the Company as correctly received. Gravel needed to replace fill which has been excavated from the trench and made unusable, in the opinion of the Company, due to failure by the Contractor to exercise reasonable care to save such otherwise usable fill in accordance with these specifications, and gravel to fill that portion of a trench opening which exceeds the width of the nominal run of the trench or the maximum trench width otherwise specified, whichever is the lesser, will be provided by the Contractor without extra cost, unless previously and specifically agreed to by the Company.
- 210.06** Where the Contractor fails to specify a unit price for gravel fill as an extra in his original quotation, no payment will be allowed.
- 210.07** Where padding is necessary in the opinion of the Company, it shall be placed in the trench bottom to a minimum depth of four inches (4") and to a minimum dimension of six inches (6") elsewhere around the pipe so as to completely encase and protect the pipe, piping materials, and coating from injury.
- 210.08** Wherever, in the opinion of the Company, the conditions of trench and surroundings is such that damage to any coating used would result from using machine methods of placing backfill to a depth of six inches (6") above pipe, Contractor shall place same by hand shoveling. This backfill, to a depth of six inches (6") above the top of appurtenances along the top of the main, shall be

placed as soon as possible after the pipe has been lowered in the trench.

210.09 Backfill shall be carefully placed under the main and any appurtenances, and compaction of the backfill to the original density is required by wetting and/or tamping by six-inch (6") layers to a level six inches (6") above the top of appurtenances along the top of the main. Similar compaction of the remainder of the trench shall be performed if required by local governmental authorities.

210.10 Whenever crossing under an existing Cast Iron or Ductile Iron main is required, the backfill material below the Cast Iron or Ductile Iron main shall be compacted to its original density by wetting and tamping in four-inch (4") layers to a level six inches (6") above the top of appurtenances along the top of the main.

210.11 The trench shall be backfilled to a point of within ten feet (10') of the end of the completed main installed each day. The trench may be left open overnight, to the extent necessary to permit testing by direct inspection methods, provided the amount is not in excess of that allowed by local governmental authorities.

211 RESURFACING

211.01 All roadway paving, sidewalk resurfacing, backfilling and compaction shall conform to local Township, Town, City, State or Federal specifications as required.

211.02 All resurfacing shall be kept in repair by the Contractor for two years. If settling or any other defect is evident, the Contractor shall make repairs at his expense until the resurfacing is determined acceptable by all governmental bodies concerned.

212 PURGING (FR 192.629, .751; ANSI 841.28)

212.01 A minimum of two (2) tested gasscopes are required for each test when purging. Continuous sampling with two (2) gasscopes at each location is required during each purge and all welding and cutting operations.

212.02 Purging During Welding and Cutting Operations

212.02.1 If no gas is detected on the L.E.L. scale of either of two (2) gasscopes, or the reading is below 10% L.E.L., it is safe to proceed without adding nitrogen.

212.02.2 If gas is detected and complete shut-off is impossible or impractical, nitrogen must be added either upstream or downstream of the welding or cutting operation until the combustible gas concentration of the mixture is decreased to a point where the admixture of any additional amount of air will not result in a flammable mixture.

212.02.2.1 If nitrogen is added downstream of the welding or cutting operation, it is safe to proceed only when sufficient nitrogen has been added to reduce the L.E.L. readings taken upstream of the welding or cutting operation with two (2) gasscopes, to below 30% L.E.L. in nitrogen

212.02.2.2 Although it is normally preferred that nitrogen be added downstream of the welding or cutting operation, specific conditions may require that nitrogen be added at an upstream location. If nitrogen is added upstream of the welding or cutting operation, it is safe to proceed only when sufficient nitrogen has been added to reduce the L.E.L. readings taken downstream of the welding or cutting operation with two (2) gasscopes, to below 20% L.E.L. in nitrogen.

Revision Section

Date

By

210.03

1/18/88

PGR

206.01.4

3/26/92

JMP

**INSTALLATION SPECIFICATIONS
AND CODE RECONCILIATION
SECTION 200A
INSTALLATION OF POLYETHYLENE GAS MAIN
AUGUST 6, 1976
(REVISED JANUARY 24, 1979)
(REVISED JANUARY 18, 1988)**

201A CONSTRUCTION SPECIFICS

- 201.01A** These specifications set forth standards to which the installation of piping shall adhere to.
- 201.02A** The specifications cover the installation and handling procedures for polyethylene pipe, tubing, and associated fittings when used for mains and service piping.
- 201.03A** Piping material is manufactured as outlined by the Department of Transportation Title 49, Part 192, TRANSPORTATION OF NATURAL AND OTHER GAS BY PIPELINE - MINIMUM SAFETY REGULATIONS and the ANSI B 31.8 Code for GAS TRANSMISSION AND DISTRIBUTION PIPING SYSTEM based on ASTM D-2513 SPECIFICATION FOR THERMOPLASTIC GAS PRESSURE PIPE TUBING FITTINGS.

202A GENERAL REQUIREMENTS

- 202.02A** The Company has the authority to enforce these specifications in accordance with Section 200 (Installation of Steel Gas Main, 3/21/75) and Section 200A (Installation of Polyethylene Gas Main, 8/6/76), (Revised January 24, 1979). This includes the stipulation that: "Any variation with, deletion from, or additions to the named references and the Project Drawings due to local conditions must originate from sound and specific reason. Arbitrary changes are not permitted. Remedial work required for noncompliance, unacceptable changes or additions, or acceptable changes or additions, where neither have received prior Company approval, will be at the Contractor's expense."

203A MATERIAL STORAGE AND HANDLING

- 203.01A** For periods of storage in excess of two weeks, the piping material shall be stored indoors, or shall be covered so as to shield it from direct sunlight. It shall be stacked so that no out-of-round flattening, or "egging" results. Exposure to excessive heat or harmful chemicals shall be avoided.
- 203.02A** When the polyethylene material must be transported, the pipe, tubing and fittings shall be handled carefully. Proper support so as to minimize movement between the pipe and its support to avoid kinking, cutting, gouging, or abrading the surface will be maintained.
- 203.03A** Prior to actual installation, polyethylene piping shall be stored on the job site in a cool dry place protected from direct sunlight.
- 203.04A** Polyethylene pipe shall not be left exposed in the work area during the absence of the installation crew, because of possible damage by vehicular or foot traffic, construction equipment and miscellaneous foreign objects.

204A INSTALLATION PROCEDURES

- 204.01A** The polyethylene pipe must be carefully inspected for cuts, gouges, deep scratches and other imperfections before use. Defective pipe will be rejected.
- 204.02A** Adequate attention must be given to polyethylene pipe during placement in the trench to prevent kinking, stretching or the striking of sharp objects. The pipe shall be snaked in the trench to permit contraction. The extra length installed shall amount to one foot per 100 feet of trench.

- 204.03A** The bottom of the trench shall be as smooth and level as practical and free of rocks and other abrasive materials. Sand or soil, free of stones and other abrasive materials, shall be used as base to protect the polyethylene piping from damage. A minimum of six inches of padding sand will be installed at the bottom of the trench.
- 204.04A** Polyethylene mains require a normal minimum cover of 44 inches. Depths less than 24 inches will not be allowed.
- 204.05A** Polyethylene service pipe shall be installed at least 30 inches below grade between the curb and the property line. The cover at the foundation wall will be 24 inches below finished grade. Depths less than 18 inches cover on private property and 24 inches cover on public property will not be allowed.
- 204.06A** A minimum clearance of three feet shall be maintained between parallel runs. A minimum clearance of twelve inches shall be maintained at crossings of a Company main and a foreign structure, or shall otherwise be protected as specifically indicated by design detail. Where in-field conditions require variations with the above, the Design Engineer shall be consulted and methods of appropriate protection shall be in accordance with his specifications.
- 204.07A** Polyethylene pipe may be bent in conformity with the natural curve of a reel. Otherwise changes in direction must be made with suitable fittings. Miter bends are not permitted and neither are bends which exhibit buckles, cracks, or other evidence of damage. There shall be a minimum of 3 feet straight run out of a branching tee, coupling, service tee, meter riser or any rigid filling before the initiation of a bend.
- 204.08A** Polyethylene pipe or tubing will be cut utilizing special cutters designed for plastic pipe to insure square cut ends.
- 204.09A** Adequate pipe anchorage will be properly installed as noted on design specifications.

205A PIPELINE SUPPORTS

- 205.01A** When polyethylene pipe or tubing is used and soil conditions are indicated to be unstable, additional support shall be provided by installing a protective polyethylene sleeve.
- 205.02A** A protective polyethylene sleeve will be installed at metal-to-plastic transition fittings, at services with a saddle and tapping tee, and at those locations where forces on the pipe may result in bending and shear stresses.
- 205.03A** The protective polyethylene sleeve will be installed in such a way that it fits securely around the pipe being protected. It will be backfilled and compacted as soon as possible to provide ground support across the span. The installation of a protective polyethylene sleeve does not eliminate the need for proper backfilling and compaction around and under the sleeve. Care must be exercised to insure that the protective polyethylene sleeve does not move from its intended position during backfilling and tamping.

206A POLYETHYLENE FUSION AND MECHANICAL JOINTS

- 206.01A** When field joints are required, the polyethylene pipe shall be cut several inches too long and the extra length distributed as slack as near as possible to the joint. This will provide for contraction of the polyethylene pipe due to temperature changes and should be in proportion of 12 inches per 100 feet of pipe.
- 206.02A** Heat-fusion joints. Each heat-fusion joint on polyethylene pipe must comply with the following:
- (1) A butt heat-fusion joint must be joined by a device that holds the heater element square to the ends of the piping, compresses the heated ends together, and holds the

pipe in proper alignment while the polyethylene hardens.

(2) A socket heat-fusion joint must be joined by a device that heats the mating surfaces of the joint uniformly and simultaneously to essentially the same temperature

(3) Heat may not be applied with a torch or other open flame.

206.03A Heat-fusion joint will not be disturbed until it has properly set for 10 minutes. Cooling time for "rough handling" will be 20 minutes after the last joint has set.

206.04A Any fused joint of questionable integrity will be removed and repaired at contractor expense.

206.05A Mechanical joints - each compression-type mechanical joint on polyethylene pipe must comply with the following:-

(1) The gasket material in the compression coupling must be compatible with the polyethylene.

(2) A metal insert stiffener must be used in conjunction with the coupling.

(3) They must effectively resist pull-out forces caused by thermal contraction or by external loading forces.

207A VALVES AND METER RISERS

207.01A Valves installed in polyethylene systems must be properly anchored to prevent rotational stresses when operated.

207.02A Meter risers shall be installed to permit easy installation of the meter at the foundation wall.

207.03A Curb boxes or other enclosures shall not be supported by the polyethylene pipe, or in any way impose stress on the pipe.

208A PRESSURE TESTING PROCEDURES

208.01A Pressure testing will not be initiated until 20 minutes after the final heat fused joint has set.

208.02A In accordance with the rating of polyethylene pipe and tubing, installations shall be tested to a pressure of at least 1.5 times the maximum operating pressure or 90 psig, whichever is greater. The test pressure, however, must not exceed three times the design pressure of the pipe or 100 psig, whichever is the least. All joints will be soap tested at this pressure before being backfilled.

208.03A Temperature of the polyethylene pipe shall not exceed 100°F during test.

209A PIPE LOCATOR AND MARKING TAPE

209.01A To facilitate location of directly buried pipe, No. 12 AWG THW coated copper wire will be strung along the full length of the pipe. The locator wire will be secured to the steel meter riser at the building wall. If the polyethylene service is connected to a polyethylene main, the locator wires for both the service and the main must be connected by stripping sufficient insulation to twist the bare copper end of the service wire onto a bare section of the main wire within six inches (6") of the service tee. This connection must be thoroughly coated with TAPECOAT MASTIC.

209.02A The locator wire and marking tape shall be installed after backfilling and tamping 12 inches above all direct burial polyethylene mains and stubs. The marking tape is high-visibility orange and is imprinted with the words, "CAUTION BURIED GAS LINE BELOW".

210A STATIC ELECTRICITY

210.01A Procedures to minimize the possibility of static electricity will include keeping the pipe wet (water spray, wet rag, wet rope), wetting down both the polyethylene pipe and excavation hole before attempting to work on the piping, and by performing squeeze-off operations in a separate excavation hole, removed from and upwind of any escaping gas.

211A INSPECTION AND REPAIR

211.01A If any section of polyethylene pipe or tubing is found to be kinked, flattened, or out-of-round, or if there is evidence of damage due to sunlight, excessive heat, or chemicals, the damaged section must be replaced.

211.02A All metal fittings and bare metallic surfaces used in conjunction with polyethylene pipe shall not be coated by any material which requires the application of heat. Fittings and surfaces requiring coating protection shall be protected by thorough application of Tapecoat Mastic.

212A PADDING AND BACKFILL

212.01A Padding sand will be installed in such a way that there will be a layer of 6 inches below and 12 inches above the pipe.

212.02A Care must be exercised when backfilling to insure that no sharp objects or rocks will be in contact with the pipe. Mechanical tamping shall not be used until 12 inches of cover has been placed over the pipe.

212.03A Special care shall be exercised to backfill and tamp the excess soil at the service tee and at all other joints of the polyethylene system.

212.04A The Contractor shall provide all equipment necessary to place padding and backfill. Padding material shall be uniform natural bank sand, graded from all particles sizes smaller than the No. 10 sieve and coarser than a No. 200. Backfill material shall consist of natural bank gravel having durable particles graded from fine (greater than No. 200) to coarse (2-inch) in a reasonably uniform combination with no boulders or stones larger than 2-inch in size. Padding and backfill material must be free of lumps, frozen material, cinders, ash, rubbish, paving material, clay, loam, rocks and any other material which might subject pipe, associated equipment, or coating, to injury. All padding and backfill material must meet the approval of the Company. All wood used for blocking or shoring must be removed from the trench prior to the backfill operation.

**NATIONAL GRID APPROVED
GAS PIPING CONTRACTORS
IN
RHODE ISLAND**

<p style="text-align: center;">Last Update 3/30/2018</p>
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Contractor Name	Address or PO Box	Town	State	Zip	Contact Name	Contact Phone	Contact Email	Notes
AGI Construction Inc	34 Appian Way	Smithfield	RI	02917	Mark Albert	401-233-0021	malbert@agiconstruction.com	All
GPL Construction Inc.	2612 Victory Highway	Glendale	RI	02826	Mike Gaudette	401-568-2810	mgaudette@gpl-construction.com	All
M&X Utility Company Inc.	1130 Dorchester Ave	Dorchester	MA	02125	Coleman Mannion	617-201-7533	mxutility2003@yahoo.com	All
Bond Bros Inc.	145 Spring St	Everett	MA	02149	Mario Fabiano	617-394-6242	mfabiano@bondbrothers.com	All

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Installing Steel Distribution Mains CNST04005

1. Purpose

This document describes the requirements for installing steel distribution mains that will have maximum allowable operating pressures (MAOPs) below 125 psig and less than 20% SMYS. If the pipeline will exceed either of these parameters, then the pipeline shall be installed in accordance with, [Installing Transmission Lines and Pipelines Operating at 125 psig or Greater \[CNST04006\]](#).

2. Responsibilities

Construct & Maintain or Designee shall be responsible for:

- Installing steel distribution mains in accordance with this procedure

3. Personal & Process Safety

All required PPE shall be worn and utilized in accordance with the National Grid Safety Policy.

4. Operator Qualification Required Tasks [Qualified or Directed & Observed]

- Task 31 – Installation of Pipe
- Task 49 – Mechanical Joining of Pipe Other Than Plastic
- Task 53 – Non-Destructive Testing of Welds
- Task 54 – Welding on a Pipeline
- Task 70 – Abnormal Operating Conditions and Properties of Natural Gas




Not all personnel shall be required to perform all tasks associated with this document. Therefore, Operations personnel shall only be required to qualify on those tasks associated with the tasks they will perform.



5. Content

General

	Mains shall be installed in accordance with the line and grade specified on the drawings for the job. Where no grade is specified, mains shall be installed in accordance with the cover requirements in the section below titled, "Steel Pipe Installation."
	The trench width shall be as described in the specifications or as directed by the National Grid representative. There shall be no undercutting of the pavement.
	All underground facilities shall be marked prior to construction. Test holes may be required to verify and determine the depth, size, and exact location of all subsurface facilities that cross or lay parallel (within the affected work area) to any excavation for the proposed installation of the gas main prior to excavating the line trench.
	Where drawings or field conditions indicate the presence of other substructures and facilities notification, mark-out, and excavation shall be in accordance with regional damage prevention procedures.
	Pipeline welding shall be performed in accordance with Welding policy [CNST05002] and Pipe


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FILE: CNST04005 INSTALLING STEEL DISTRIBUTION MAINS	ORIGINATING DEPARTMENT: STANDARDS, POLICIES AND CODES	SPONSOR: DAN McNAMARA

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	Welding Safety [CNST05003] .
	All excavations shall be performed in accordance with, Standards for Working in Excavations M-1301 .
	The finished pipe shall be clean, dry, and free of foreign material.
	Install cathodic protection in accordance with National Grid's specifications including, Corrosion Design Criteria [COR01100] . Steel mains including welds, valves, and fittings shall be properly coated per the, Facility Coating Guide [030031-CS] .
	Anodes and test stations shall be installed as designated on the drawings. In the absence of specific guidance on the drawings or from Corrosion Engineering refer to, Installation of Magnesium Anodes [COR04001] and Installation of Test Stations for Cathodic Protection [COR04003] .
	Insulating joints shall be installed as designated on the drawings. Install and electrically-test each insulated joint in accordance with, Installation of Insulating Joints for Cathodic Protection [COR04005] .
	Pipeline markers shall be installed at locations indicated on the installation drawings and as per, Pipeline Markers for Main and Transmission Lines [DAM01020] .
	If supplemental odorization is required prior to placing the pipeline in service, it shall be performed in accordance with, Supplemental Odorization for New Piping [INR06002] .
	Prior to and after the pressure test, the pipeline shall be cleaned to the satisfaction of National Grid. Brush pigs shall be used to clean the pipe before testing. After a hydrostatic test, foam pigs shall be used to remove all water and to dry the pipeline. Sufficient "pig" runs shall be made to ensure a clean, dry pipeline prior to introducing natural gas into the pipeline. This is determined by measuring dust penetration into the pig. Generally, dust penetration of less than 1 inch is acceptable.
	For pressure testing mains refer to, Pressure Testing Mains Operating Below 125 psig [CNST04003] .
	If there is a plan to uprate the pipeline in the future to operate at pressures of 125 psig or greater, or operate at 20% SMYS or greater, then the pipeline shall be installed and repaired in accordance with the more stringent requirements described in, Installing Transmission Lines and Pipelines Operating at 125 psig or Greater [CNST04006] .
	NY Only: Per 16 NYCRR Part 255.552 (b), any operator proposing to increase the maximum allowable operating pressure of a pipeline which was originally constructed to operate at a pressure of less than 125 psig to a pressure of 125 psig or more shall comply with the reporting requirement of subdivision 255.552 (a). If the increase in pressure is proposed within three years of the initial operation of a pipeline which, at the higher pressure proposed, would fall within the definition of "major utility transmission facility" as set forth in Section 120(2) of the Public Service Law, a hearing will be held on the proposed increase, unless such hearing is waived by the Commission on the application of staff of the Department. In addition with respect to any such increase, the operator shall, in addition to the reporting requirements set forth above, provide in writing to staff the basis of the need for the increase, a discussion of how the increase will serve the public interest, convenience and necessity, and such assurance as staff may require, including documentation, that no undue hazard will result from operation of the line at the higher


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	pressure.
	For situations where pipelines are exposed to the public (such as aboveground piping) and where the pipeline may be used by the public for unintended purposes, signs should be posted to warn the public to keep away from these facilities.

Inspections

	Perform a thorough field inspection to prevent damaged/gouged, grooved pipe, or coating from being installed in the completed pipeline. The inspection shall be performed by someone other than a person who participated in the construction (49 CFR 192.305).
	When an applied-coating holiday test is required, perform the test in accordance with, Testing of Pipe Coating [COR03001] .
	Inspect the bottom of the excavation just before the pipe is lowered in and remove any object that could harm the piping.
	Inspect the fit of the pipe to the ditch prior to backfilling to prevent unnecessary strain on the pipe.
	All exposed existing piping shall be inspected for hazardous liquids in accordance with, Handling Contaminated Materials and Piping [SHE02001] prior to working on the pipe.
	Examine all exposed existing piping for external corrosion and the condition of the coating in accordance with, Inspection of Exposed Steel Pipe for Corrosion [COR02020] . In addition, existing piping, whenever accessible or removed such as at tie-ins, shall be internally examined for signs of corrosion in accordance with, Inspection of Exposed Steel Pipe for Corrosion [COR02020] .

Supporting Existing Structures and Utilities

	Exposed gas facilities shall be properly supported
	Gas facilities that will be crossed or exposed shall be excavated in accordance with regional damage prevention procedures.
	<p>If an in-service unrestrained coupling is unearthed on a high-pressure (pressures above low pressure) pipeline while excavating, then precautions shall be taken to prevent pipe pullout. Unrestrained couplings located near pipeline offsets or bends present a higher risk than couplings on straight segments of pipe due to the longitudinal force applied to the offset or bend from the pressure in the pipe. Prior to fully exposing the unrestrained coupling, in order to prevent pipe pullout, ensure that the pipe on each side of the coupling is embedded in the earth before fully exposing the coupling.</p> <p>If an unrestrained coupling is unearthed after a pipeline offset or bend is unearthed, then further excavation work shall stop until the pipeline is adequately braced horizontally and vertically.</p>
	If Gas Control and Gas Systems Engineering provide permission for the operating pressure of the in-service pipeline to be lowered or for the pipeline to be shut down, then the risk of pipe pullout will be reduced.

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	An unrestrained coupling that is unearthed shall be restrained using anchorage lugs and threaded rods. Provide plastic insulators for the reinforcing lugs as necessary (refer to Construction standard, Supplemental Restraining of Non-Restraining Mechanical Compression Couplings and Caps on Steel Pipe [MAIN-6220]). Following the installation of an insulating coupling, contact Corrosion for testing.
	If visual inspection is not conclusive about whether an exposed coupling is self-restraining or unrestrained, refer to the markings on the coupling to determine its status. Contact Engineering if guidance is needed.
	The Installer shall notify the National Grid field representative when cast iron mains, eight (8) inches and less in diameter, are exposed. Prior to undermining any cast iron, refer to the regional cast iron encroachment policy.
	Adequately support all other subsurface facilities to ensure protection from damage. Any damage shall be promptly reported to Supervision.
	Maintain the integrity of fences, poles, and other structures adjacent to the trench, pits, and work area.
	Exercise care to prevent damage to transverse and parallel curbs, sidewalks, driveways, and property monuments.

Materials


	Steel pipes shall comply with the material specifications contained in, Steel Pipe API 5L Grade B, X42 and Greater [120020-MS] . Factory-coated steel pipes shall comply with External Coating of Steel Pipe with Pritec [MS-017] or Coating and Inspection of Steel Pipe with Fusion Bonded Epoxy (FBE) and Powercrete Abrasion Resistant Epoxy Overlay [MS-018] .
	Steel fittings such as flanges, ells, tees, reducers, and caps shall be forged welded fittings in accordance with National Grid specifications. Prior to the start of construction, material certifications and material grades/markings shall be verified to ensure that they meet the design requirements.

Steel Pipe Installation

	The pipe shall be laid without causing unnecessary strain on the pipe. The pipe shall be laid with as few vertical and horizontal changes in direction as possible.
	The bottom of the trench shall be relatively smooth and free of any objects which may damage the pipe coating. The backfill material to be used around the main and for a minimum of six (6) inches over the piping shall be free of any material that could be harmful to the pipe surface (see Backfill and Restoration [CNST01003]).
	In areas where it is not practicable to pad the trench with sand prior to lowering the pipe into the trench, sand bags shall be placed in the trench to act as a bed for the pipe. These bags shall generally be placed at intervals of ten (10) feet or as directed. After the pipe has been positioned and welded in the trench, sand backfill acceptable to the National Grid field representative shall be placed. The sand bags shall then be broken in a manner acceptable to the National Grid field

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	representative.
	<p>Downstate NY: An alternative method is to use pressure-treated wood (creosote wood shall not be allowed) bed blocks having a minimum width of ten (10) inches with protective felt or ½-inch thick pads for line-up and support prior to welding so as not to damage the pipe coating. When pressure-treated wedges are used with the bed blocks, they shall be driven between the bed blocks and pads and not between the pipe and the pad. Following welding, the pipe shall be inspected and jeep tested. The blocks shall be removed prior to backfilling and compaction.</p>
	<p>The amount of cover from the top of the pipeline (e.g., tees, couplings, and other appurtenances) to finished grade shall be as shown on the project drawings and as described in the project specifications. If not specified, the pipeline shall be installed with the covers shown in Table 1 below. The cover may be varied at the discretion of the National Grid Project Engineer in order to avoid interference with existing structures or high ground water conditions. Where an underground structure prevents the installation of the pipeline with the minimum cover, obtain permission from the appropriate agency, where required, and protect the pipeline (such as with steel plates). For highway and railroad crossings refer to, Design Requirements for Installation of Casings [ENG04010] for casing cover requirements when casings are required and Design of Distribution Mains [ENG04001].</p>


Table 1: Cover Requirements				
Region	Streets and Roads Not Controlled by the State or the DOT		State Right-of-Way	
	Recommended	Minimum	Below the Roadway Minimum	Outside the Roadway but within the Right-of-Way Minimum
MA ¹	36"	24" (MA DPU approval required for less than 24")	36" (MA DPU approval required for less than 36")	36" (MA DPU approval required for less than 36")
RI	30"	24"	36"	36"
DNY ²	30" (< 20" pipe) 36" (≥ 20" pipe)	24" (<20" pipe) 36" (≥ 20" pipe)	60" NY (DOT approval required for less than 60")	36" (NY DOT approval required for less than 36")
UNY ²	30"	24"	60" (NY DOT approval required for less than 60")	36" (NY DOT approval required for less than 36")
All	48 inches of cover in soil below navigable river, stream, or harbor or 24 inches in consolidated rock between the top of the pipe and the underwater natural bottom.			
Notes 1. In MA: <ul style="list-style-type: none"> Pipelines installed in highways under the jurisdiction and control of the Massachusetts Department of Transportation (DOT) shall have a minimum cover of 36-inches from the top of the main to the finished 				


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	<p>grade (220 CMR 101.06 (12)).</p> <ul style="list-style-type: none"> Minimum cover of less than that in the table shall meet the following requirements (220 CMR 101.06 (12)(e)), unless approved otherwise in writing by the MA DPU: <ul style="list-style-type: none"> Minimum cover shall be approved by MA Department of Public Utilities, Pipeline shall be properly protected from anticipated external loads (e.g., steel plates) Pipeline MAOP shall produce a stress of less than 20% of its SMYS <p>2. In NY:</p> <ul style="list-style-type: none"> All pipe which is installed in areas actively cultivated for commercial farm purposes in at least two out of the last five years, as identified by the farmland operator, shall be installed with a minimum cover of 40 inches unless the farmland operator agrees to or requires a different depth. (16 NYCRR Part 255.327) <p>STATE ROADS: (NY State permit required.) No gas main installations in roadways shall be made except by special permission. Install gas mains behind the curb or in the sidewalk areas. All new gas mains crossing state highways shall be enclosed in sleeves or directionally drilled and wherever possible, be jacked or drilled beneath the roadway without disturbance to the pavement. The point of penetration shall not be less than five (5) feet below the lowest point of pavement. (17 NYCRR Part 131.9)</p>
	Each pipe segment shall be thoroughly cleaned to remove all dirt or foreign matter from the ends of the pipe before the joints are aligned for welding.
	In order to keep the inside of the pipe free of foreign material, a suitable tamp plug or cap shall be installed on the open ends of the pipeline at the end of each day. Any foreign matter which may enter the pipe after laying and joining operations have been completed shall be removed by suitable means before the final test.
	If pigging is to be performed to clean the pipe and the need arises to cap the laterals, then only full-restraint or welded end caps shall be used to resist the pressure from the pigging operations.
	It is imperative that the inside of the pipe be kept free and clean of all obstructions and it shall be the Installer's responsibility to protect the pipe from any hazard. In the event that a storm, broken water main, or other condition should allow water and muck into the line, the Installer shall be required to clean the pipe in a manner that is acceptable to National Grid.
	At the end of each day's work, the pipe shall be capped, made watertight, and anchored to prevent movement in the event the trench becomes flooded.
	<p>The preferred clearance for distribution piping when crossing other underground structures is twelve (12) inches. However, distribution piping shall have a minimum clearance of six (6) inches from other underground facilities or structures not used in conjunction with the installation of the gas pipeline, except as follows. Where this distance cannot be achieved, a field representative shall notify Gas Systems Engineering for guidance on how to protect the gas distribution facility. The minimum clearance, provided the main is suitably protected from other underground structures, is two (2) inches (four (4) inches minimum preferred for LI).</p> <p>Note: Six (6) inches of clearance from water lines should be maintained, whenever practicable.</p>
	Consideration should be given regarding protection for the coating on steel pipes located in close proximity to steam lines.
	Changes in direction of piping should be made with welded fittings such as ells, whenever possible. If field cold bending is necessary for line pipe, it shall be performed in accordance with,

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	Field Cold Bending of Line Pipe [CNST04007] to ensure that pipe ovality limits and minimum radii requirements are met. Upon completion of the bending, check the coating for defects in accordance with, Testing of Pipe Coating [COR03001] and repair it in accordance with, Application of Coating Systems [COR02001] .
	The preferred method of joining steel pipe is by welding. The cut end of the pipe shall be beveled in accordance with Welding Policy [CNST05002] . Welding elbows furnished by National Grid should be either 90 degrees or 45 degrees long radius with a wall thickness that at least matches the pipe thickness.
	When welded sections of pipe are lowered into the trench, care shall be taken to prevent a permanent bend or distortion to the pipe.

Repairing Steel Pipe

	Each imperfection or damage that impairs the serviceability of the pipe shall be repaired or removed. If repair is made by grinding, the remaining wall thickness shall at least be equal to either (49 CFR 192.309(a)): <ul style="list-style-type: none"> The minimum thickness required by the tolerances in the specification to which the pipe was manufactured; or The nominal wall thickness required for the design pressure of the pipeline.
	A gouge, groove, arc burn, or dent shall <u>not</u> be repaired by insert patching or pounding out.
	Each gouge, groove, arc burn, or dent that is removed from a length of pipe shall be removed by cutting out the damaged portion as a cylinder. The cylinder shall be replaced with a new pipe that meets the design specification.
	Notches and laminations on pipe ends shall not be repaired; the damaged portion shall be removed as a cylinder and the pipe ends re-beveled.

Pipe Joining

	Unless otherwise noted, joints between pipe sections, valves, and fittings shall be welded. All welding, inspections, and nondestructive testing shall be performed in accordance with, Welding Policy [CNST05002] and Pipe Welding Safety [CNST05003] .
	Whenever practicable, joints shall not be located under active tracks or any other substructures.
	The welder and inspector or foreman shall visually examine the quality of all the welds.
	All steel distribution mains shall have at least 10% of all welds nondestructively examined in accordance with, Welding Policy [CNST05002] . A Main Field Record (weld map) should be created with the welds numbered along the length of the pipeline.
	In MA, these weld examinations shall be made available to the DPU (220 CMR 101.06 (9)).
	Compression couplings and caps may only be used under extenuating circumstances, such as for tie-ins, where welding is not practicable. If non-restraining mechanical couplings or caps are

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	used, then they shall be restrained in the field using anchorage lugs and threaded rods in accordance with, Supplemental Restraining of Non-Restraining Mechanical Compression Couplings and Caps on Steel Pipe [MAIN-6220] . Approved self-restraining couplings and caps require no further supplemental restraining when installed in accordance with the manufacturer's specifications.
	Threaded joints shall not be used, unless specifically approved by the National Grid VP of Gas Systems Engineering or the VP of Asset Management for a particular project or condition.

Valves

	Valves shall be furnished as specified in the particular project specifications and they shall be of the appropriate pressure class to meet or exceed the MAOP of the pipeline.
	All valves should be below grade and shall have roadway boxes which provide access to the operating mechanism.
	At National Grid's option, valves may be pressure tested prior to installation as specified in the particular project specification.
	The Installer shall use extreme care when making a valve weld.
	If the valve leaks during a pressure test National Grid, at its option, may arrange to contact the manufacturer's representative for assistance, and if National Grid determines it necessary, a replacement valve will be ordered.
	The Installer shall leave line valves in an open position and purge valves in a closed position. The Installer shall not open and close valves after installation unless directed by the Field representative.
	System Interconnection Valves – A minimum of two valves placed in series that are used for manual pressure control between two mains operating at different MAOPs may be installed provided they are approved by Gas Control and Long-Term Planning. The valves shall be installed in accordance with current standards or special designs as specified by Project Engineering & Design, but as a minimum shall be of the appropriate pressure class for the system with the highest MAOP and shall be installed with pressure taps upstream, downstream, and between both valves. Lock high-pressure valves to prevent unauthorized operation.

Application and Testing of Protective Coating


	Field-Applied Coating: The external surfaces of bare steel pipe, pipe welded joints, anode and test lead connections, valves, fittings, and pipe coating damage, etc. shall be cleaned and coated in accordance with, Application of Coating Systems [COR02001] .
	Tests and Inspection of Coating: <ul style="list-style-type: none"> Standards of Acceptance: It is the intent of this procedure to require protective coating completely free from holidays and other faults. Work not satisfying these requirements shall

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	<p>be repaired in accordance with, Application of Coating Systems [COR02001]. Care shall be exercised during all phases of the application of protective coating to prevent cleaning, priming, or coating materials from damaging or adhering to any internal surfaces. Prior to backfilling, holiday testing should be performed by jeep testing the pipe in accordance with Testing of Pipe Coating [COR03001].</p> <ul style="list-style-type: none"> National Grid Acceptance Test: National Grid or its representative will perform a pipe-to-earth electrical potential test, as it deems necessary, to ensure adequate cathodic protection and coating integrity in accordance with, Measuring Pipe-to-Soil Potential [COR03002].
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Recordkeeping

	Main field records shall be required for all pipe installations per, Preparation of Gas Facility Historical Records [CNST01005] .
	<p>The Installer shall keep a historical record and update all related drawings of work performed and facilities encountered in performing the work. The location of all welds shall be indicated and numbered in sequence on the project historical drawings. These historical records and drawings shall include the following:</p> <ul style="list-style-type: none"> The locations of pipes, valves, directional drills, welds, mechanical couplings, and casings by stations and offsets relative to the baseline. Cover or elevations relative to the bench run shall be taken at every weld and sleeve end. The locations of insulating joints and valves by stations and offsets relative to baseline and take-offs from physical structures such as houses, poles, etc. The locations of cathodic protection test stations and attachment to pipe by station, offset, and elevation. The locations of subsurface obstructions, listing the type of obstruction by station, offset, and elevation.
	The final completed historical package shall be presented to the National Grid Project Engineer prior to placing the pipeline in service. Refer to Processing Gas Main and New Services Work Packages [GEN03002] .

6. Knowledge Base & References [\(Click here\)](#)

Knowledge Base		References
1 - Compliance History	5 - Job Aid	1 - Regulatory – Codes
2 - Data Capture	6 - Learning & Development	2 - Technical Documents
3 - Definitions	7 - Standard Drawings	3 - Tools Catalog
4 - Document History	8 - Tools & Equipment	

7. Attachments

No attachments

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GUIDELINES FOR BACKFILL AND COMPACTION AROUND GAS PIPES

PERMANENT BACKFILL AND COMPACTION

DESCRIPTION

This work shall consist of backfilling and compacting all disturbed material at and around existing gas pipes and facilities. Size of pipe, material, length of exposed pipe, location of pipe, etc. will all follow the same set of Standards and Specifications stipulated by Nationalgrid Company. If design plans call for gas pipes to be exposed and supported (sheeting methods not used), then at the time of backfill, all disturbed material below the invert of the gas pipe shall be removed and replaced with suitable roadway or trench excavation material or bedding material. The contractor will not be allowed to replace this disturbed material with the same existing material if it has now been mixed with adjacent silty subsoil (clays) and fines. Well-graded gravel and sands will be used to replace the unsuitable material when no excess suitable material is available on site. Soils with high humus or mineral content should not be used to for backfill because they can promote electrolytic or bacterial attack.

Backfilling the gas pipe should begin immediately after the work in that location is complete. The region within 6" alongside and on top of the gas pipe shall be backfilled with padding sand (free of cinders, ash, and rock). In no case shall the material used for backfilling in this region contain any stones. Backfill shall consist of suitable materials (medium to coarse sands with little or no silts) placed in layers of not more than 8" to 12" after compaction.

Trench spoil material shall be suitable for backfilling above the padding material as long as rocks with a diameter larger than 3" are removed. The layers shall be mechanically compacted to the industry standard of 95% or until a density comparable to the unexcavated material is achieved. In some instances, flooding with water is an acceptable method of compaction but only if the back-fill material is clean, coarse, and adequate drainage is existent. The above specified backfill material is essential in order to attain the degree of compaction necessary to avoid future settlement.

Tracing Wire, if necessary, shall be installed 2" to 6" below Plastic gas pipes.

Warning Tape shall be installed approximately 12" above the gas pipe.

A minimum of 2" temporary pavement shall be applied over the trench as soon as possible.



10/01/12

Guidelines for Working Around Gas Utilities

Notification of Construction

National Grid requests at least six week advanced notification prior to the start of construction to perform scheduled work in the proposed project area. Be aware that some gas work cannot be performed during the normal heating season.

Support and Protect

Contractor must call Dig Safe to have the gas mains and services marked out before construction. Care must be exercised when saw cutting over any gas infrastructure, especially services, which are more shallow than the main. Depth of gas mains vary. Contractor shall dig test pits in order to ascertain exact locations, cover and invert elevations, clearances, alignment and operating status of existing gas facilities. Contractor shall exercise extreme caution when excavating in the vicinity of any gas facility. Hand excavation shall be performed to locate all gas facilities and whenever digging within 24" of gas facilities. If cover over gas piping is removed the required cover must be replaced, or if not feasible, National Grid must be notified for review of the issue. Undermined gas pipe must be adequately supported and protected from damage. Contact National Grid engineer for guidelines regarding proper pipe support. Significant vibration from pile driving and such may negatively impact gas facilities, particularly cast iron mains and regulator station vaults. Contact National Grid engineer prior to performing such activities as well as operations which may undermine gas facilities such as micro-tunneling, jacking, directional drilling, etc.

Gas Leaks

For any gas leak please call the appropriate number immediately.

Greater Boston - 800-233-5325

Other Massachusetts – 800-548-8000

Rhode Island – 800-640-1595

Types of Gas Facilities

Gas mains and services are made of several different materials and contain a wide range of pressures. Typical materials used for buried gas pipe includes bare steel, coated steel, plastic, cast iron, wrought iron, ductile iron, and copper. Never assume that a pipe is not gas. At times gas lines are inserted into older lines to save excavation cost.

Exposure of Gas Facilities

If any gas mains or services become exposed, National Grid must be notified to inspect the line before backfilling. Also any damage that may have been made to the pipe or pipe coating will need to be repaired by National Grid before backfilling. Contact our Dispatch office at (877) 304-1203 for inspection. It is important that even minor damage or scrapes be reported to National Grid. Backfill shall be 6" of sand around the gas line and clean compacted fill above.



Regulator Stations

Gas regulator stations are particularly critical facilities and National Grid must be notified whenever work is to take place within 200 feet of a station. Regulator stations are typically in buried vaults accessed through either manhole covers or aluminum doors. **ONLY AUTHORIZED NATIONAL GRID EMPLOYEES SHALL OPEN A REGULATOR STATION VAULT.** Be aware that a complex nest of piping and valves often exists in the vicinity outside the vaults.

Blasting

National Grid must be notified of any blasting that will take place within 200 feet of a gas utility. National Grid must be supplied with a detailed blast plan for blasting in the vicinity of gas facilities. The evaluation of the blast plan by a National Grid engineer may take some time, therefore, blast plan data should be submitted at least two weeks prior to the planned blasting. As a general rule blasting will not be permitted within 10 feet of a gas line and PPV at the nearest gas pipe shall not exceed 5 in/sec. PPV at the nearest gas main shall be monitored.

Valves

Access to gas valves must be maintained throughout construction and left at grade at the end of construction. Should valve boxes be damaged and need to be replaced National Grid will supply replacements upon request. **NEVER OPERATE A GAS VALVE. ONLY NATIONAL GRID SHALL OPERATE GAS VALVES.**

Clearance

Adequate clearance must be provided when installing other utilities, foundations, structures, etc. Contact National Grid engineer for guidance.

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	Pressure Testing Mains Operating Below 125 psig	Revision 2.2 – 9/25/17

Pressure Testing Mains Operating Below 125 psig CNST04003

1. Purpose

All newly-installed mains shall be subjected to the pressure test requirements herein prior to being placed in service to demonstrate the strength and tightness of the pipeline. This procedure describes the requirements for performing pressure tests on pipelines with maximum allowable operating pressures (MAOPs) below 125 psig and less than 20% of their specified minimum yield strength (SMYS). Refer to [Pressure Testing Mains Operating at 125 psig or Greater \[CNST04004\]](#) for pressure testing mains with MAOPs at or above 125 psig, or greater than or equal to 20% SMYS.

2. Responsibilities

Construct & Maintain or Designee shall be responsible for:

- Conducting the pressure test on distribution mains according to this procedure.
- Recording all appropriate information required for the pressure test.

Instrumentation & Regulation or Designee shall be responsible for:

- Preparing regulator stations and piping associated with the main being tested.

3. Personal & Process Safety

All required PPE shall be worn and utilized in accordance with the current National Grid Safety Policy.



Inspect all test equipment for proper operation prior to each use.



When possible, consideration should be given to cover (plate) openings where pipelines and fittings are under test pressure. Signs may be displayed warning the public and the crew members that a pressure test is underway.



All testing of pipelines during construction shall be conducted in a manner which provides a safe environment for employees and the public during the test. Suitable steps shall be taken to keep persons not working on the testing operations out of the testing area.

4. Operator Qualification Required Tasks [Qualified or Directed & Observed]


- Task 34 – Performing Pressure Test on a Pipeline
- Task 70 – Abnormal Operating Conditions / Properties of Natural Gas

5. Content





General

As necessary, all construction debris and/or loose scale should be removed from the pipeline via suitable methods.

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	Pressure Testing Mains Operating Below 125 psig	Revision 2.2 – 9/25/17


	The pipeline subjected to the pressure test shall be isolated from all other piping containing gas or combustible material. Closed valves are <u>not</u> acceptable isolating devices between the test section and other piping containing gas.
	All components of the pipeline being tested shall be designed for the required test pressure.
	It is recommended that test gauges be located at the pipe ends opposite to that used for introduction of the test medium to ensure that the entire run of the pipeline is subjected to the test pressure and that any interposed valves are open.
	Gauges shall be verified for accuracy, calibrated, or replaced as required. A calibrated pressure gauge that will indicate increments of two psig or less shall be attached to the test section (16 NYCRR Part 255.507(e)).
	Air, nitrogen, or water, when specified, shall be used as the test medium.
	<u>Attachment 1</u> : Pressure Test Guide may be used as an aid during the job briefing and pressure test.
	Pipelines shall be purged into service in accordance with, Purging Requirements for Gas Pipelines [CNST03005].


Pipe End Restraint

	Except as noted below, prior to pressure testing, the pipe ends shall be welded or flanged on steel pipe and fused on plastic pipe. Restraining or non-restraining mechanical end caps shall not be used (except as noted below).
	Elster Perfection fully-stab end caps 2" diameter or less are acceptable for plastic pipe end restraint, provided they are used within the manufacturer's maximum allowable test pressure of 150 psig.
	If there is a known mechanical coupling or if an all-fused or welded installation cannot be confirmed in the main being tested, refer to Pressure Testing of New Mains: MAOP of 124 psig or Less [CS-MAIN004] for approved restraining methods, where required.
	When pressure testing cast iron pipe as part of an inner seal or lining project, the use of mechanical caps is allowed, provided the cap is properly mechanically anchored and blocked. Refer to the regional-approved method.




Test Pressure and Minimum Durations

	All new mains, or new segments of main replaced in existing pipelines, shall be tested to the minimum pressures and durations listed in Table 1. Cast iron and steel mains reconditioned with cured-in-place liners shall be tested in accordance with Table 2. The test duration shall be measured after the pressure source has been disconnected and sufficient time has elapsed for
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	Gas Work Method Mains	Doc. # CNST04003 Page 3 of 8
	Pressure Testing Mains Operating Below 125 psig	Revision 2.2 – 9/25/17

	the main and the test medium to reach a state of pressure equilibrium.																																															
	Whenever possible, tie-in joints should be included in the pressure test. Tie-in joints that are not pressure tested shall be soap tested at the pipeline's operating pressure.																																															
	<p>Table 1: Minimum Pressure Test Durations for Plastic Pipelines (\leq 12-inch diameter) and Steel Pipelines Operating Below 20% of SMYS¹</p> <table><tr><th rowspan="2">Main Length, (Ft)</th><th colspan="3">Pipe Diameter</th></tr><tr><th><12 in</th><th>12 to 16 in</th><th>> 16 in</th></tr><tr><td>< 1,500</td><td>1 hour</td><td>2 hours</td><td>4 hours</td></tr><tr><td>1,500 to 2,999</td><td>2 hours</td><td>4 hours</td><td>6 hours</td></tr><tr><td>3,000 to 4,499</td><td>3 hours</td><td>6 hours</td><td>8 hours</td></tr><tr><td>4,500 to 5,999</td><td>4 hours</td><td>8 hours</td><td>10 hours</td></tr><tr><td>\geq 6,000</td><td colspan="3">Consult Gas Systems Engineering for pressure test durations</td></tr></table> <p>Note 1: The minimum required test pressures are as follows:</p> <table><tr><th>MAOP</th><th>Required Test Pressure</th></tr><tr><td>\leq 60 psig</td><td>90 psig</td></tr><tr><td>> 60 psig</td><td>1.5 times the MAOP</td></tr></table> <p>Table 2: Cast Iron and Steel Mains Reconditioned with Cured-in Place Liners</p> <table><tr><th rowspan="2">Pipeline</th><th colspan="2">Test Pressure</th><th rowspan="2">Duration</th></tr><tr><th>Pipelines Operating at Low Pressure</th><th>Pipelines Operating above Low Pressure but below 100 psig</th></tr><tr><td>Cast Iron</td><td>10 psig</td><td>10 psig or 1.5 times MAOP, whichever is greater</td><td>See Table 1, with the exception that in New York the minimum duration is 2 hrs. for < 12" diameter pipe and < 1,500 ft. main.*</td></tr><tr><td>Steel</td><td>90 psig</td><td>90 psig</td><td>See Table 1</td></tr></table> <p>*Per NY PSC encroachment waiver Case 03-G-1507, Appendix A, "Procedure for use of cured-in-place liners for 6 inch and 8 inch cast iron mains affected by third-party excavations".</p>	Main Length, (Ft)	Pipe Diameter			<12 in	12 to 16 in	> 16 in	< 1,500	1 hour	2 hours	4 hours	1,500 to 2,999	2 hours	4 hours	6 hours	3,000 to 4,499	3 hours	6 hours	8 hours	4,500 to 5,999	4 hours	8 hours	10 hours	\geq 6,000	Consult Gas Systems Engineering for pressure test durations			MAOP	Required Test Pressure	\leq 60 psig	90 psig	> 60 psig	1.5 times the MAOP	Pipeline	Test Pressure		Duration	Pipelines Operating at Low Pressure	Pipelines Operating above Low Pressure but below 100 psig	Cast Iron	10 psig	10 psig or 1.5 times MAOP, whichever is greater	See Table 1, with the exception that in New York the minimum duration is 2 hrs. for < 12" diameter pipe and < 1,500 ft. main.*	Steel	90 psig	90 psig	See Table 1
Main Length, (Ft)	Pipe Diameter																																															
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	<p>Test requirements for steel pipelines to operate at a hoop stress less than 30% of SMYS and at or above 100 psig:</p> <p>Whenever the test pressure on steel pipelines is 20% or more of SMYS and natural gas, inert gas, or air is the test medium, the line shall be checked for leaks either by a leak test at a pressure greater than 100 psig but less than 20% SMYS or by walking the line while the pressure is held at 20% SMYS (49 CFR 192.507)</p>																																															

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	NY Only: To allow for minimal interruption when large groups of customers are serviced, plastic piping in lengths not exceeding 1,500 feet that will be used for dead main insert renewals may be tested for 30 minutes prior to insertion followed by a 30-minute test after insertion at 90 psig or one and a half times MAOP, whichever is greater (16 NYCRR Part 255.507 (g)).
	<p>The plastic pipe surface shall not exceed 100°F during the pressure test (49 CFR 192.513 (d)). Exposed piping shall be protected from direct sunlight which may produce temperatures that exceed this during the pressure test. Several options are available for pressure testing on hot days:</p> <ul style="list-style-type: none"> • Conduct the pressure test in the morning before the temperature gets too hot • Cover the pipe with soil to protect the pipe from the sun • Perform the pressure test when the temperature cools down • Use an intercooler for the compressed air, if available
	No work shall be performed on pipelines undergoing a pressure test.

Pressure Test Failures

	Leaks indicated by a pressure loss not attributable to temperature variation or that cannot be detected by the standard soap and water test shall be cause to discontinue the pressure test. Any test failure shall be reported immediately to the National Grid supervisor. After any leaks are repaired, the pressure test shall be repeated in its entirety to the satisfaction of National Grid and the safety inspector, where applicable.
	If the failure is suspected to be material related, the National Grid Supervisor shall report the issue to Gas Standards, & Materials following the steps outlined in Gas Operating Procedure Reporting Nonconforming Material [GEN01009] . Furthermore, if the failed section involves PE pipe or fittings, and the failure is suspected to be due to installation or fusion error, the section should be cut out and removed in the "as-tested" configuration and returned with the Nonconforming Material Report. Do not disassemble or attempt to repair. Gas Materials & Standards shall investigate and determine the root cause. If a fitting, such as an untapped fused tee) can not be cut out due to field conditions, it may be abandoned in place, but a full report must still be submitted.

Pretested Pipe

	<p>Polyethylene (PE) and steel tie-in sections of pipe for mains shall be pressure tested.</p> <p>Piping for drop-in piece tie-ins made up from pipe, elbows and offset components (or a straight section of short pipe as required) shall be pre-tested in accordance with Table 1 prior to installation. The drop-in piece shall be tested as a whole to include the intermediate joints connecting the components.</p> <p>Once installed, the tie-in joints for this pretested pipe shall be soap tested with leak detection fluid at the operating pressure of the main (49 CFR 192.503 (d)).</p>
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FOR THE LATEST AUTHORIZED VERSION PLEASE REFER TO THE APPROPRIATE DEPARTMENT WEBSITE OR DOCUMENTUM™.



File: CNST04003 Pressure Testing Mains Operating Below 125 psig	Originating Department: Standards, Policies and Codes	Sponsor: Dan McNamara
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	<p>For complex drop-in pieces where it is impractical to handle, transport, or install the assembly in one piece (e.g., large-diameter pipe, full tees, unwieldy configurations, space constraints for fit-up), the complex drop-in piece may be installed in sections provided that the individual sections have been pre-tested.</p> <p>Once installed, all tie-in joints for the pre-tested complex drop-in piece pipe shall be soap tested with leak detection fluid at the operating pressure of the main (49 CFR 192.503 (d)).</p> <p>If field conditions permit, the drop-in piece, or straight section of pipe may be pressure tested at the worksite inside the excavation if space permits. If tested inside the excavation, the pipe may be capped and pressure tested independently or as part of the main line being tested and then cut off.</p> <p>A drop-in piece may be pretested off-site. Straight pipe to be used for drop-in pieces may be tested off-site and stored at designated off-site locations. Any pipe pretested off-site shall be identified by a suitable means including a traceable pressure test record which includes the information listed below under, "Test Records."</p> <p>Identification shall be maintained on the tested parent host pipe as it is drawn down from storage. Air or water may be used as the test medium. Pipe to be pretested shall have welded connections and welded end caps.</p> <p>Pipe pretesting shall be conducted in a manner that provides a safe environment for employees and the public during the test. Suitable steps shall be taken to keep persons not working on the testing operations out of the testing area.</p>
	<p>New York Only:</p> <p>For steel mains reconditioned with cured-in-place liners (CIP) if a single welded end cap component is the only item being added to the steel pipeline, the end cap does not require a pretest. Once installed, the weld shall be soap leak-tested with leak detection fluid at the operating pressure of the main (49 CFR 192.503 (d)).</p> <p>A single component with a valid ASME or MSS specification pressure rating (e.g., 150# Class, 300# Class) may be installed without a pressure test if its design test pressure is equal to or greater than the minimum test pressure shown in Table 1.</p>
	<p>MA Only: Pretested Pipe</p> <p>Per Mass. DPU letter of Interpretation dated April 04, 2008:</p> <ul style="list-style-type: none"> • Pre-tested pipe shall be used for mains only. • Pre-tested pipe shall be no more than 12 feet in length. • Pre-tested pipe shall be tested at least 90 psig or 1.5 times the MAOP of the main, whichever is greater. • Pre-tested pipe shall have been tested within twelve (12) months prior to the installation date. • Pre-tested pipe shall be visually inspected for damage at the time of installation. • Tie-in joints, for pre-tested pipe, shall be soap or leak-tested at the operating pressure of the main. No intermediate joints are permitted • Pipe used for bypasses shall be tested or pre-tested in accordance with this procedure.

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Reducing Pressures in the Pipeline Following the Pressure Test

	Bleed-down of the pressure medium shall be controlled in such a manner as to minimize the hazard to life and property.
	All internal pressure shall be released from the main prior to removing test equipment, end caps, and required blocking.


Mains Not Immediately Gassed-in Upon Completion of Construction

	On rare occasions, circumstances may prevent the pipeline from being gassed-in immediately following the pressure test. For example, this may occur when the pipeline needs to be installed in advance due to a road paving moratorium. Under these circumstances, it may be advantageous to leave residual air pressure (not greater than 15 psig) in the pipeline after the pipeline has been pressure tested.
	When there is a delay gassing-in a main residual air pressure, left in the pipeline, provides a way to detect whether the pipeline has been subject to third-party excavation damage. To ensure that this practice is performed only when necessary, prior approval shall be obtained from the director responsible for the area before leaving residual air pressure in a pipeline.
	<p>Once the area director provides approval, the requirements below shall be followed:</p> <ul style="list-style-type: none"> • Provide a valve and pressure gauge at a suitable location (e.g., at a service riser) • Do not exceed a maximum residual air pressure of 15 psig • On the pressure test tag, indicate the residual air pressure being left in the pipeline and attach the tag adjacent to the pressure gauge • Revise the SOP if the step of removing the air pressure from the pipeline prior to performing any other work was not already included • If the residual pressure remains in the pipeline for more than seven (7) days, then weekly pressure checks should be performed • Perform a pressure test just prior to gassing-in the main

Test Records

	<p>Each operator shall make a record of each test performed. The record shall contain at least the following information (49 CFR 192.517):</p> <ul style="list-style-type: none"> • The operator's name, the date, the name of the operator's employee responsible for making the test (including signature), and the name of any test company used. • Test medium used. • Test pressure.

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	<ul style="list-style-type: none"> • Test duration. • Pressure recording charts, or other record of pressure readings. • Elevation variations, whenever significant for the particular test. • Leaks and failures noted and their disposition.
	Each operator shall maintain the record for the useful life of the pipeline in accordance with regional practices.

6. Knowledge Base & References [\(Click here\)](#)

Knowledge Base		References
1 - Compliance History	5 - Job Aid	1 - Regulatory – Codes
2 - Data Capture	6 - Learning & Development	2 - Technical Documents
3 - Definitions	7 - Standard Drawings	3 - Tools Catalog
4 - Document History	8 - Tools & Equipment	

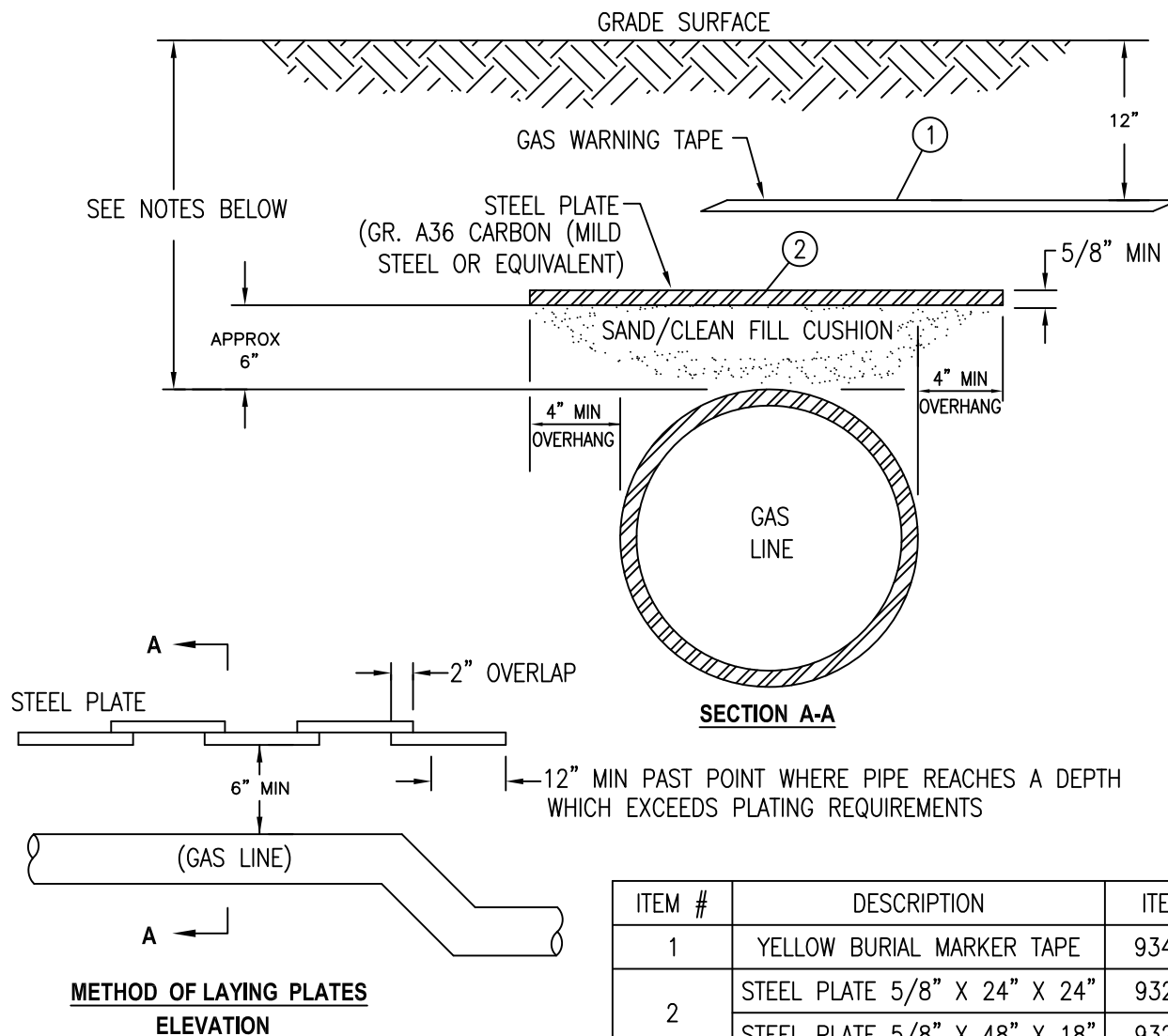
7. Attachments

Attachment 1: Pressure Test Guide

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Attachment 1: Pressure Test Guide

Pressure Test Guide Use as a guide during the job briefing session and during the pressure test. (For each category check all that apply)			
1. Type of Pipe Construction Under Test <input type="checkbox"/> Welded <input type="checkbox"/> Fused <input type="checkbox"/> Coupled <input type="checkbox"/> Cured-In-Place Lining	2. Type of Couplings <input type="checkbox"/> Self-Restraining Compression <input type="checkbox"/> Self-Restraining Hydraulic <input type="checkbox"/> Electrofusion <input type="checkbox"/> Non-Restraining Compression <input type="checkbox"/> Other _____		
3. Design MAOP Pressure <input type="checkbox"/> LP <input type="checkbox"/> HP - 15 PSIG <input type="checkbox"/> HP - 60 PSIG <input type="checkbox"/> Other: _____	4. Test Pressure <input type="checkbox"/> 90 PSIG <input type="checkbox"/> Other: _____	5. Test Medium <input type="checkbox"/> Air <input type="checkbox"/> Nitrogen <input type="checkbox"/> Water	6. Test Duration <input type="checkbox"/> 1 Hour <input type="checkbox"/> 2 Hours <input type="checkbox"/> 4 Hours <input type="checkbox"/> 6 Hours <input type="checkbox"/> Other: _____
7. Test Recorder <input type="checkbox"/> Dial Gauge <input type="checkbox"/> Recording Chart <input type="checkbox"/> Recording Chart w/Dead Weight Tester <input type="checkbox"/> Temperature Recording Chart	8. Pipe End Cap Blocking <input type="checkbox"/> None Required <input type="checkbox"/> Per CS-MAIN004 <input type="checkbox"/> Other – attach sketch	9. Strapping <input type="checkbox"/> None <input type="checkbox"/> Other: _____	10. Backfill <input type="checkbox"/> Entire Run Except Ends <input type="checkbox"/> Exposed/Inserted <input type="checkbox"/> Other: _____
11. <input type="checkbox"/> Barricades	12. <input type="checkbox"/> Warning Signs		
13. Soap Test <input type="checkbox"/> All exposed fittings. <input type="checkbox"/> Tie-in Connections & Couplings.			



PROTECTIVE PLATES ARE REQUIRED:

1. FOR ANY GAS TRANSMISSION LINE OPERATING IN EXCESS OF 125 PSIG AND HAVING LESS THAN THREE FEET (3') OF COVER.
2. FOR ANY GAS MAINS OPERATING AT LESS THAN 125 PSIG HAVING LESS THAN THREE FEET (3') OF COVER IN A STATE ROAD.
3. FOR ANY GAS MAINS OPERATING AT LESS THAN 125 PSIG HAVING LESS THAN TWO FEET (2') OF COVER IN A NON STATE ROAD.
4. FOR ANY SERVICE LOCATED IN THE PUBLIC RIGHT-OF-WAY HAVING LESS THAN EIGHTEEN INCHES (18") OF COVER.
5. FOR ANY SERVICE LOCATED IN PRIVATE PROPERTY HAVING LESS THAN TWELVE INCHES (12") OF COVER.

NOTES:

1. MAINS OR TRANSMISSION LINES INSTALLED WITH LESS THAN TWO FEET (2') OF COVER REQUIRE APPROVAL OF THE MASSACHUSETTS DPU.
2. MAINS OR TRANSMISSION LINES INSTALLED WITH LESS THAN THREE FEET (3') OF COVER IN MASSACHUSETTS STATE ROADWAYS/HIGHWAYS REQUIRE APPROVAL OF THE STATE AGENCY (E.G. MHD).
3. REFER TO NATIONAL GRID DOCUMENT CNST-5010 FOR REGULATORY COMPLIANCE REQUIREMENTS FOR SHALLOW MAIN AND SERVICE INSTALLATION (E.G. DTE WAIVER).
4. REFER TO ENG02001, ENG03001, & ENG04001 FOR ADDITIONAL DETAILS FOR GAS MAIN AND SERVICE INSTALLATIONS.
5. FIELD SUPERVISOR TO PROVIDE SKETCH (WHICH INCLUDES ALL DIMENSIONS AND TIES) OF THE NEWLY INSTALLED STEEL PLATE OVER GAS MAINS, TRANSMISSION LINES AND SERVICES.

nationalgrid

MASSACHUSETTS

PROTECTIVE STEEL PLATING FOR GAS MAINS AND SERVICES

REVISIONS: NEW DRAWING

Addendum No. 2 Attachments

DATE: 03/15/2019

DESIGN: W. FROMM

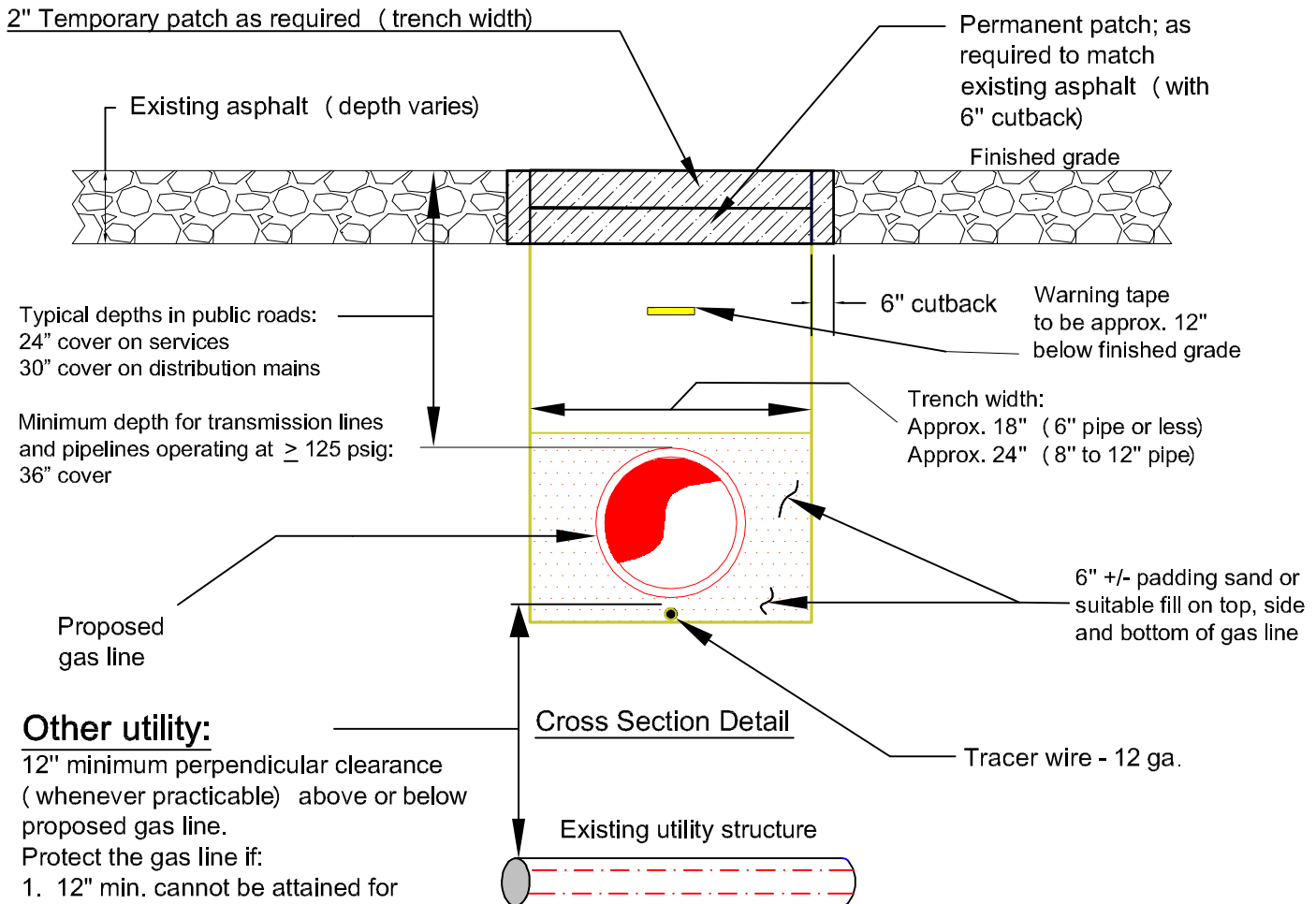
DRAWN: G. HURLEY / P.D.

EFFECTIVE DATE: 03/15/2019

STD. DWG.
NO.

CNST-6030

Typical Utility Crossing and Trench Guidelines



Other utility:

12" minimum perpendicular clearance (whenever practicable) above or below proposed gas line.

Protect the gas line if:

1. 12" min. cannot be attained for gas transmission lines and pipelines operating at ≥ 125 psig.
2. 6" min. cannot be attained for distribution mains.
3. 4" min. cannot be attained for services.

Minimum clearance when protection is provided against damage is 2" for all gas lines.

Pipeline backfill will consist of suitable materials (medium to coarse sands with little or no silts) placed in layers of no more than 8" to 12" after compaction. Trench spoil materials suitable for backfilling will be mechanically compacted to the industry standards of 95% (as measured by Drop-Cone Penetrometer method) or until a density comparable to the unexcavated material is achieved.

nationalgrid

RI

TYPICAL UTILITY CROSSING AND TRENCH GUIDELINES

Key Changes:

DATE: 09/15/2014

EFFECTIVE DATE: 09/15/2014

DESIGN: N. COSTANZO

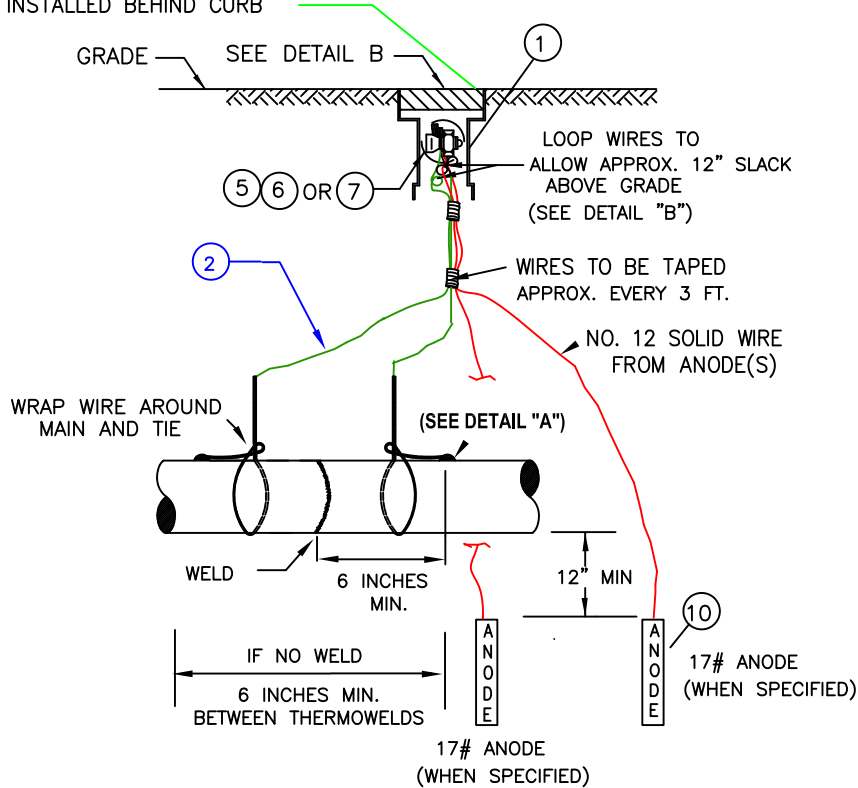
DRAWN: N. COSTANZO

STD. DWG. NO. **CS-CNST002**

TWO WIRE TEST STATION WITH ANODE(S)

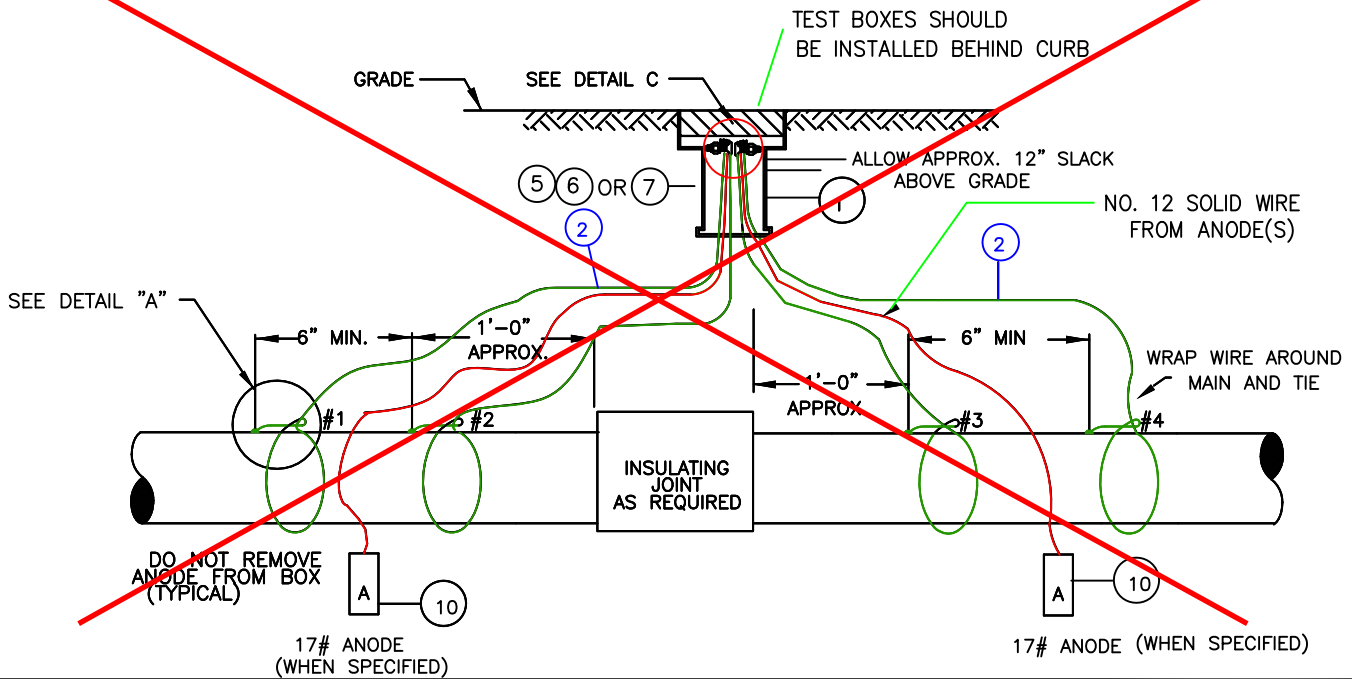
Can be installed without anodes

TEST BOXES SHOULD
BE INSTALLED BEHIND CURB



FOUR WIRE TEST STATION WITH ANODES

Can be installed without anodes



nationalgrid

ALL REGIONS

INSTALLATION OF TEST STATIONS FOR CATHODIC PROTECTION

REVISIONS: REVISED USING SAP ITEM ID'S

DATE: 07/15/2010

EFFECTIVE DATE: 09/15/2013

DESIGN: PG

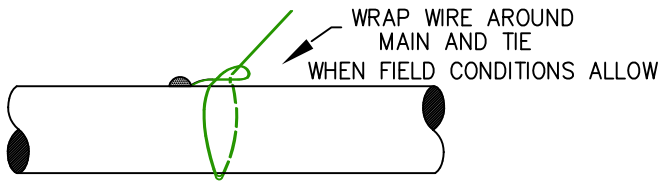
STD. DWG.

APPROVED: PS

NO.

030026-CS

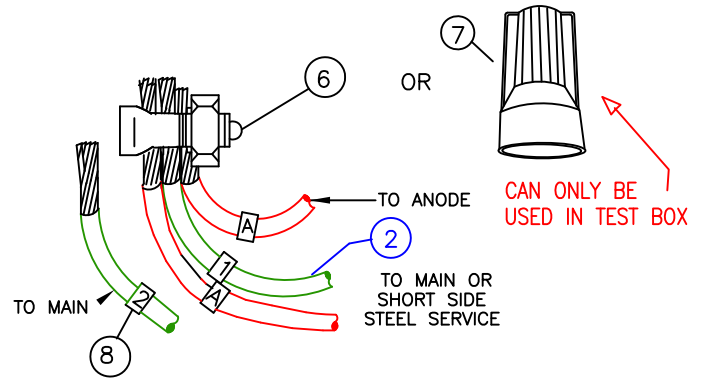
ATTACH WIRE IN ACCORDANCE
WITH APPROVED THERMOWELD PROCEDURE



DETAIL "A"

Two wire test station

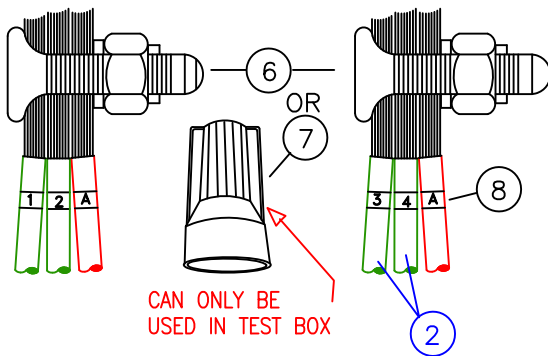
Shown with 2 anodes



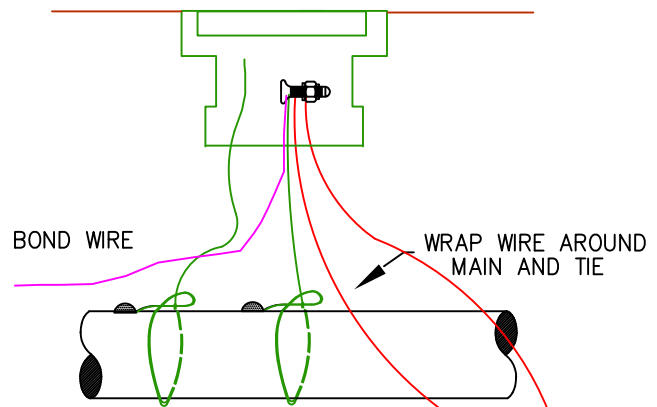
DETAIL "B"

Four wire test station

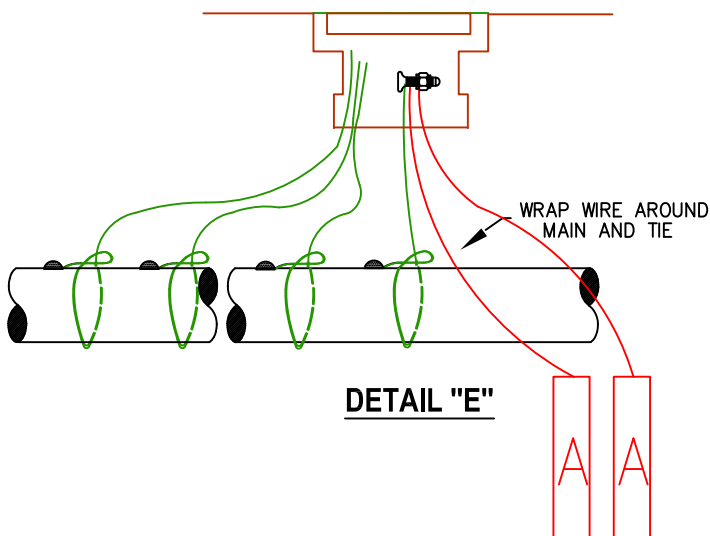
CONNECT ALL WIRES AS NEEDED



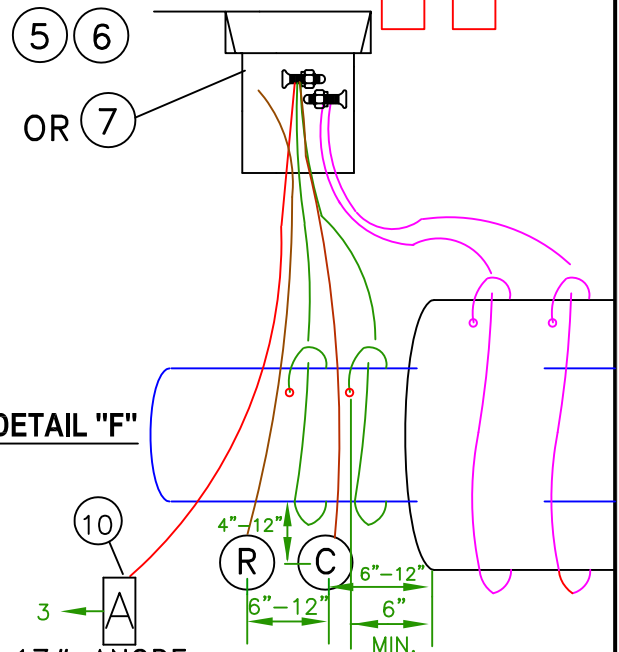
DETAIL "C" (typ)



DETAIL "D"



DETAIL "E"



DETAIL "F"

MATERIAL LIST

	Description	Down State SAP Item I.D	Upstate SAP Item I.D	New England SAP Item I.D	Rhode Island SAP Item I.D	MATERIAL NOTES
1	TEST BOX WITH COVER or TEST BOX 9" SQUARE HEAVY DUTY COVER FOR 9" SQUARE BOX	9339892 9339391 9339797	9312291 UPSTATE BOXES COME IN ONE PIECE	9339892 9339391 9339797	(Sm - 445) 9311209 or (Lg - 556) in Prov. 9311208	NON LOCKING COVER. DISCARD FOOT PIECE. (PREFERRED USAGE FOR GRASS AND DIRT AREAS) WEIGHS 95 LBS, STREET USE, WITHOUT COVER PREFERRED USAGE FOR ROADWAY INSTALLATIONS NON-LOCKING COVER
2	WIRE, NO. 8, 7 STRAND	9334425	9307539	9334425	9307539	TEST WIRE ONLY, NOT FOR GROUND BEDS, UPSTATE AND RI WIRE HAS 19 STRANDS.
3	WIRE, NO. 6, 7 STRAND	9334294	9311795	9334294	9311795	BOND WIRE ONLY, NOT FOR GROUND BEDS
4	WIRE 1/0 – 19 STRAND 600 V –1/C	9334171	NON STOCK	9334171	NON STOCK	USE IN STRAY CURRENT AREAS
5	TAPE, PVC - ¾" WIDE	9334056	9316070	9334056	9316070	NOT FOR PIPE COATING.
6	CONNECTOR, SPLIT BOLT, TYPE 6 CONNECTOR, SPLIT BOLT FOR #8 WIRE	9331578 9331641	9316630 9331641	9331578 9331641	NON STOCK 9331641	USE WITH NO. 6 CABLE
7	CONNECTOR, SPLIT BOLT, TYPE 1/01 CONNECTOR, TWIST-ON WIRE NUT	9331612 9330683	- 9314631	9331612 9330683	- 9314631	USE WITH 1/0 CABLE
8	TAG, ADHESIVE NUMBER 1 NUMBER 2 NUMBER 3 NUMBER 4 LETTER A	9340592 9340593 9340594 9340595 9340598	9307918 9307896 9307895 9307894 9307893	9340592 9340593 9340594 9340595 9340598	9307918 9307896 9307895 9307894 9307893	LABEL WITH #1 (N) OR (E), CONSECUTIVELY TO (S) OR (W) SEE DETAILS "B" AND "C" USE TO LABEL ANODES
9	GROUNDING CELL	NON STOCK	9315642	NON STOCK	NON STOCK	AS SPECIFIED BY CORROSION ENGINEERING
10	ANODE, MAGNESIUM 17LBS	9339399	9311183	9339399	9311183	SATURATE WITH WATER BEFORE BACKFILL. ANODE MAY BE INSTALLED VERTICALLY OR HORIZONTALLY.
11	COUPON	9386100	By Corrosion	9386100	By Corrosion	MC MILLER OR EQUAL
12	REFERENCE CELL	9385758	By Corrosion	9385758	By Corrosion	BORIN MFGR INC OR EQUAL

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RI CONTRACT NO. 2018-CB-088

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CODE 701.9901 12" DUCTILE IRON WATER PIPE – INSULATED – TEMPORARY
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CODE 701.9903 12" DUCTILE IRON WATER PIPE – INSULATED - PROPOSED
CODE 701.9904 12" DUCTILE IRON WATER PIPE – NON-INSULATED – PROPOSED

All work under this item shall be in accordance with Section 701 of the Rhode Island Standard Specifications for Road and Bridge Construction, 2004 Edition (Amended March 2018 and Compilations), the Rules and Regulations of the Kent County Water Authority, 2006 Edition with all Erratum up until September 17, 2015, and the American Water Works Association (AMWA) standards for water main construction. In the event of a conflict, the more stringent requirements shall govern, at the approval of the Engineer, at no additional cost.

The Kent County Water Department, through its authorized agents, reserves the right to make inspection of the work during its manufacture and/or progress at any time.

DESCRIPTION:

Ductile Iron Pipe: Work under these items shall consist of the furnishing and installation of 12" insulated and non-insulated water main along the temporary utility bridge and along the proposed alignment as per the plans and the limits described below. Also included within the respective items are the furnishing and installation of all fittings and pipe joints, furnishing and installing insertion valves, furnishing and installing roller supports on the temporary and proposed bridges, hauling and handling materials, filling and flushing of the pipe, disinfection, pressure testing required laboratory sampling, applicable excavation and the connection of the temporary and proposed pipes to the existing lines. Furnishing and installation of gate valves shall be paid under "Item 701.8112 12 Inch Gate Valve and Box". All required thrust blocks or restrained pipe sections shall be included, except the thrust restraints on the piers on the temporary utility bridge will be paid under Item 802.9901.

Trenching will be in association with Section 205 of the Rhode Island Standard Specifications but will not be measured for payment. If rock is encountered when placing the temporary or proposed pipe, it will be removed in accordance with Item 205.0270 Trench Rock Excavation – Mechanical (0-7').

Work under the temporary ductile iron water pipe items will include the removal of the pipes at the end of the job. The connection of the existing pipes to the temporary pipe shall be paid under Item 701.9902. The connection of the proposed water pipe to the existing shall be paid under Item 701.9904. Insertion valves shall be paid under Item 701.9902.

The proposed pipe will be insulated within the vault on each end of the bridge and along the bridge. The proposed pipes that extend into the approach roadway from the back of the vault shall be non-insulated. All temporary pipes not covered by soil shall be insulated.

SUBMITTALS: The Contractor shall prepare temporary and proposed utility submissions for review and approval by the Kent County Water Authority. These submittals shall show all locations and details of tie-ins, thrust restraints, insertion valve locations and details, blow offs and installation sequences and procedures. These submittals shall also show any pertinent details relating to the Temporary Utility Bridge. All components, connections and details shall be designed, and the submittals sealed by a Professional Engineer registered in the State of Rhode Island, who shall provide complete design, detailed shop drawings and computations to Kent County Water Authority for review and approval. The designer shall coordinate with and complete all design in accordance with the respective utility

company requirements. Working drawings and calculations shall be submitted in accordance with Subsection 105.02. The submitted installation sequences shall include coordination with the Kent County Water Authority and provide a minimum of one weeks' notice prior to the commencement of work on any water utility throughout the progression of work.

MATERIALS

All materials shall conform to the applicable standards and shall be new, unused and purchased specifically for this Contract.

Ductile Iron (DI) Pipe: The ductile iron pipe for the temporary and proposed locations shall be a Class 52 double cement mortar lined zinc coated and shall have push-on type joints except at fittings, which shall be mechanical joints. The insulated pipes shall be insulated with an aluminum or stainless-steel cover.

CONSTRUCTION METHODS

Unless otherwise specified herein or in the Contract Documents, all work shall be performed in accordance with the referenced standards.

METHOD OF MEASUREMENT.

"12" DUCTILE IRON WATER PIPE – INSULATED – TEMPORARY" will be measured for payment by the number of "Linear Feet" of water main actually installed in accordance with the Plans and/or as directed by the Engineer.

"12" DUCTILE IRON WATER PIPE – NON-INSULATED – TEMPORARY" will be measured for payment by the number of "Linear Feet" of water main actually installed in accordance with the Plans and/or as directed by the Engineer.

"12" DUCTILE IRON WATER PIPE – INSULATED – PROPOSED" will be measured for payment by the number of "Linear Feet" of water main actually installed in accordance with the Plans and/or as directed by the Engineer.

"12" DUCTILE IRON WATER PIPE – NON-INSULATED – PROPOSED" will be measured for payment by the number of "Linear Feet" of water main actually installed in accordance with the Plans and/or as directed by the Engineer.

BASIS OF PAYMENT

The accepted quantity of "12" DUCTILE IRON WATER PIPE – INSULATED – TEMPORARY" will be paid for at the contract bid price per Linear Foot, as listed in the proposal. The price so-stated constitutes full and complete compensation for furnishing and installing new DI pipe and fittings, furnishing and installing mechanical joints as required by the Engineer or as shown on the drawings, furnishing and installing roller supports along the temporary utility bride, filling and flushing of the pipe, disinfection, pressure testing, required laboratory sampling and removal of the pipe at the end of the job.

"12" DUCTILE IRON WATER PIPE – NON-INSULATED – TEMPORARY" will be paid for at the contract bid price per Linear Foot, as listed in the proposal. The price so-stated constitutes full and complete compensation for furnishing and installing new DI pipe and fittings, furnishing and installing mechanical joints as required by the Engineer or as shown on the drawings, making connections

between temporary and existing water mains (including couplings), filling and flushing of the pipe, temporary plugging of inactive pipe sections, disinfection, pressure testing, thrust blocks, required laboratory sampling and all excavation related items including trench excavation, dewatering, support of excavations, furnishing and installing required bedding material, backfilling with suitable excavated material, furnishing and installing Common Borrow where suitable material does not exist, removing and disposing of pavement/concrete and removing excess soil and removing the pipe at the end of the job.

“12” DUCTILE IRON WATER PIPE – INSULATED – PROPOSED” will be paid for at the contract bid price per Linear Foot, as listed in the proposal. The price so-stated constitutes full and complete compensation for furnishing and installing new DI pipe and fittings, furnishing and installing roller supports along the proposed bridge, furnishing and installing mechanical joints as required by the Engineer or as shown on the drawings, filling and flushing of the pipe, disinfection, pressure testing required laboratory sampling and the connection of the pipe within the utility vault.

“12” DUCTILE IRON WATER PIPE – NON-INSULATED – PROPOSED” will be paid for at the contract bid price per Linear Foot, as listed in the proposal. The price so-stated constitutes full and complete compensation for furnishing and installing new DI pipe and fittings, furnishing and installing mechanical joints as required by the Engineer or as shown on the drawings, making connections between temporary and existing water mains (including couplings), plugging of unused water lines, filling and flushing of the pipe, disinfection, pressure testing, thrust blocks, required laboratory sampling and all excavation related items including trench excavation, dewatering, support of excavations, furnishing and installing required bedding material, backfilling with suitable excavated material, furnishing and installing Common Borrow where suitable material does not exist, removing and disposing of pavement/concrete and removing excess soil.

JOB SPECIFIC

**ITEM CODE 702.9902
STORMWATER TREATMENT UNIT (JELLYFISH)**

**JELLYFISH® MEMBRANE FILTRATION SYSTEM (JELLYFISH)
STORMWATER QUALITY – MEMBRANE FILTRATION SYSTEM
STANDARD SPECIFICATION**

1. GENERAL

1.1. The Contractor shall furnish and install the Jellyfish, complete and operable as shown and as specified herein, in accordance with the requirements of the plans and contract documents. The water quality treatment flow shall be as determined and approved by the Engineer of Record. The Jellyfish system removes pollutants from stormwater runoff through the unit operations of sedimentation, floatation, and membrane filtration.

1.2. The Jellyfish shall be a JF6-6-1 model as shown on the plans. The manufacturer of the Jellyfish shall be:

Contech Engineered Solutions LLC
9025 Centre Pointe Drive West
Chester, OH, 45069
Tel: 1 800 338 1122

If an approved equal product is proposed by the Contractor and accepted for use, the Contractor shall be responsible for preparing a permit modification and obtain approval from RIDEM without additional cost.

1.3. Submittals: Shop drawings for the structure and performance are to be submitted with each order to the contractor. Contractor shall forward shop drawing submittal to the consulting engineer for approval. Shop drawings are to detail the structure precast concrete and call out or note the fiberglass (FRP) internals/components.

1.4.American Society for Testing and Materials (ASTM) Reference Specifications:

- 1.4.1. ASTM C891: Standard Specification for Installation of Underground Precast Concrete Utility Structures
- 1.4.2. ASTM C478: Standard Specification for Precast Reinforced Concrete Manhole Sections
- 1.4.3. ASTM C858: Standard Specification of Underground Precast Concrete Utility Structures
- 1.4.4. ASTM C857: Standard Practice for Minimum Structural Design Loading for Underground Precast Concrete Utility Structures
- 1.4.5. ASTM C990: Standard Specification for Joints for Concrete Manholes Using Preformed Flexible Joint Sealants
- 1.4.6. ASTM D4101: Standard Specification for Copolymer steps construction
- 1.4.7. ASTM D4097: Standard Specification for Contact-Molded Glass-Fiber-Reinforced Thermoset Resin Corrosion-Resistant

2. MATERIALS

All materials shall be in conformance with Section 702 of the Rhode Island Department of Transportation Standard Specifications for Road and Bridge Construction (2013 and latest revisions).

2.1.Precast Concrete Structure: The device shall be an all concrete structure (including risers), constructed from precast concrete riser and slab components or monolithic precast structure(s). Precast concrete vault shall be provided according to ASTM C857 and C858 and manholes shall be provided according to ASTM C478. Both structure types shall be installed to conform to ASTM C891 and to any required state highway, municipal or local specifications; whichever is more stringent. All precast concrete components shall be manufactured to a minimum live load of HS-20 truck loading or greater based on local regulatory specifications, unless otherwise modified or specified by the design engineer.

2.2. Gaskets: The device shall be watertight. Gaskets and/or sealants to provide water tight seal between concrete joints. Joints shall be sealed with preformed joint sealing compound conforming to ASTM C990.

2.3. Internal Components:

2.3.1. Fiberglass: The fiberglass portion of the filter device shall be constructed in accordance with the following standard: ASTM D4097: Contact Molded Glass Fiber Reinforced Chemical Resistant Tanks.

2.3.2. Cartridge Deck: The cylindrical concrete device shall include a fiberglass insert. The rectangular concrete device shall include a coated aluminum insert. In

either instance, the insert shall be bolted and sealed watertight inside the precast concrete chamber. The insert shall serve as: (a) a horizontal divider between the lower treatment zone and the upper treated effluent zone; (b) a deck for attachment of filter cartridges such that the membrane filter elements of each cartridge extend into the lower treatment zone; (c) a platform for maintenance workers to service the filter cartridges (maximum manned weight = 450 pounds); (d) a conduit for conveyance of treated water to the effluent pipe.

2.3.3. Membrane Filter Cartridges: Filter cartridges shall be comprised of reusable cylindrical membrane filter elements connected to a perforated head plate. The number of membrane filter elements per cartridge shall be a minimum of eleven 2.75-inch (70-mm) or greater diameter elements. The length of each filter element shall be a minimum 15 inches (381 mm). Each cartridge shall be fitted into the cartridge deck by insertion into a cartridge receptacle that is permanently mounted into the cartridge deck. Each cartridge shall be secured by a cartridge lid that is threaded onto the receptacle, or similar mechanism to secure the cartridge into the deck. The maximum treatment flow rate of a filter cartridge shall be controlled by an orifice in the cartridge lid, or on the individual cartridge itself, and based on a design flux rate (surface loading rate) determined by the maximum treatment flow rate per unit of filtration membrane surface area. The maximum design flux rate shall be 0.21 gpm/ft² (0.142 lps/m²).

2.3.4. Each membrane filter cartridge shall allow for manual installation and removal. Each filter cartridge shall contain no less than 7 ft² of surface area per inch of length and have filtration membrane surface area and dry installation weight as follows (if length of filter cartridge is between those listed below, the surface area and weight shall be proportionate to the next length shorter and next length longer as shown below):

Filter Cartridge Length (in)	Minimum Filtration Membrane Surface Area (ft ² / m ²)	Maximum Filter Cartridge Dry Weight (lbs / kg)
15 / 381	106 / 9.8	10.0 / 4.5
27 / 686	190 / 17.7	14.5 / 6.6
40 / 1016	282 / 26.2	19.5 / 8.9
54 / 1372	381 / 35.4	25.0 / 11.4

2.3.5. Backwashing Cartridges: The filter device shall have a weir extending above the cartridge deck, or other mechanism, that encloses the high flow rate filter cartridges when placed in their respective cartridge receptacles within the cartridge deck. The weir, or other mechanism, shall collect a pool of filtered water

during inflow events that backwashes the high flow rate cartridges when the inflow event subsides. All filter cartridges and membranes shall be reusable and allow for the use of filtration membrane rinsing procedures to restore flow capacity and sediment capacity; extending cartridge service life.

- 2.3.6. Maintenance Access to Captured Pollutants: The filter device shall contain an opening(s) that provides maintenance access for removal of accumulated floatable pollutants and sediment, removal of and replacement of filter cartridges, cleaning of the sump, and rinsing of the deck. Access shall have a minimum clear height over all of the filter cartridges (length of cartridge + 6 inches), or be accessible by a hatch or other mechanism that provides vertical clear space over all of the filter cartridges such that the cartridges can be lifted straight vertically out of the receptacles and deck for the entire length of the cartridge.
- 2.3.7. Baffle: The filter device shall provide a baffle that extends from the underside of the cartridge deck to a minimum length equal to the length of the membrane filter elements. The baffle shall serve to protect the membrane filter elements from contamination by floatables and coarse sediment. The baffle shall be flexible and continuous in cylindrical configurations, and shall be a straight concrete or aluminum wall in rectangular configurations.
- 2.3.8. Sump: The device shall include a minimum 24 inches (610 mm) of sump below the bottom of the cartridges for sediment accumulation, unless otherwise specified by the design engineer. Depths less than 24 inches may have an impact on the total performance and/or longevity between cartridge maintenance/replacement of the device.
- 2.3.9. Steps: Steps shall be constructed according to ASTM D4101 of copolymer polypropylene, and be driven into preformed or pre-drilled holes after the concrete has cured, installed to conform to applicable sections of state, provincial and municipal building codes, highway, municipal or local specifications for the construction of such devices.
- 2.3.10. Double-Wall Containment of Hydrocarbons: The cylindrical precast concrete device shall provide double-wall containment for hydrocarbon spill capture by a combined means of an inner wall of fiberglass, to a minimum depth of 12 inches (305 mm) below the cartridge deck, and the precast vessel wall.
- 2.4. Bend Structure: The device shall be able to be used as a bend structure with minimum angles between inlet and outlet pipes of 90-degrees or less in the stormwater conveyance system.
- 2.5. Frame and Cover: Frame and covers must be manufactured from cast-iron or other composite material tested to withstand H-20 or greater design loads, and as approved by the local regulatory body. Frames and covers must be embossed with the Contech

or the Jellyfish brand name.

2.6. Doors and Hatches: If provided shall meet designated loading requirements or at a minimum for incidental vehicular traffic.

3. PERFORMANCE

3.1. Function: The Jellyfish filter shall function to remove pollutants by the following unit treatment processes; sedimentation, floatation, and membrane filtration.

3.2. Pollutants: The Jellyfish filter shall remove oil, debris, trash, coarse and fine particulates, particulate-bound pollutants, metals and nutrients from stormwater during runoff events.

3.3. Bypass: The Jellyfish filter shall typically utilize an external bypass to divert excessive flows. Where an internal bypass is utilized, systems shall be equipped with a floatable baffle, and bypass water shall not pass through the treatment sump or cartridge filtration zone.

3.4. Treatment Flux Rate (Surface Loading Rate): The Jellyfish filter shall treat 100% of the required water quality treatment flow based on a maximum design flux rate (surface loading rate) across the membrane filter cartridges not to exceed 0.21 gpm/ft² (0.142 lps/m²).

3.5. Field Testing: At a minimum, the Jellyfish filter shall have been field tested and verified with a minimum 25 qualifying storm events and field monitoring conducted according to the TARP Tier II or TAPE field test protocol, and have received NJCAT verification.

3.6. Suspended Solids Removal: The Jellyfish filter shall have demonstrated a minimum median TSS removal efficiency of 85% and a minimum median SSC removal efficiency of 95%.

3.7. Fine Particle Removal: The Jellyfish filter shall have demonstrated the ability to capture fine particles as indicated by a minimum median removal efficiency of 75% for the particle fraction less than 25 microns, an effluent d50 of 15 microns or lower for all monitored storm events, and an effluent turbidity of 15 NTUs or lower.

3.8. Nutrient (Total Phosphorus & Total Nitrogen) Removal: The Jellyfish filter shall have demonstrated a minimum median Total Phosphorus removal of 55%, and a minimum median Total Nitrogen removal of 50%.

3.9. Metals (Total Zinc & Total Copper) Removal: The Jellyfish filter shall have demonstrated a minimum median Total Zinc removal of 50%, and a minimum median

Total Copper removal of 75%.

4. EXECUTION

Installation and construction shall be in conformance with Section 702 of the Rhode Island Department of Transportation Standard Specifications for Road and Bridge Construction (2013 and latest revisions).

4.1. Handling and Storage: Prevent damage to materials during storage and handling.

4.2. Precast Concrete Structure: The installation of a watertight precast concrete device should conform to ASTM C891 and to any state highway, municipal or local specifications for the construction of manholes, whichever is more stringent. Selected sections of a general specification that are applicable are summarized below.

4.2.1. The watertight precast concrete device is installed in sections in the following sequence:

- aggregate base
- base slab
- treatment chamber and cartridge deck riser section(s)
- bypass section
- connect inlet and outlet pipes
- concrete riser section(s) and/or transition slab (if required)
- maintenance riser section(s) (if required)
- frame and access cover

4.2.2. The precast base should be placed level at the specified grade. The entire base should be in contact with the underlying compacted granular material. Subsequent sections, complete with joint seals, should be installed in accordance with Contech's recommendations.

4.2.3. Adjustment of the Jellyfish filter can be performed by lifting the upper sections free of the excavated area, re-leveling the base, and re-installing the sections. Damaged sections and gaskets should be repaired or replaced as necessary to restore original condition and watertight seals. Once the Jellyfish filter has been constructed, any/all lift holes must be plugged watertight with mortar or non-shrink grout.

4.3. Inlet and Outlet Pipes: Inlet and outlet pipes should be securely set into the device using approved pipe seals (flexible boot connections, where applicable) so that the structure is watertight, and such that any pipe intrusion into the device does not impact the device functionality.

4.4. Frame and Cover Installation: Adjustment units (e.g. grade rings) should be installed to set the frame and cover at the required elevation. The adjustment units should be laid

in a full bed of mortar with successive units being joined using sealant recommended by Contech. Frames for the cover should be set in a full bed of mortar at the elevation specified.

- 4.5. In some instances the Maintenance Access Wall, if provided, shall require an extension attachment and sealing to the precast wall and cartridge deck at the job site, rather than at the precast facility. In this instance, installation of these components shall be performed according to instructions provided by Contech.

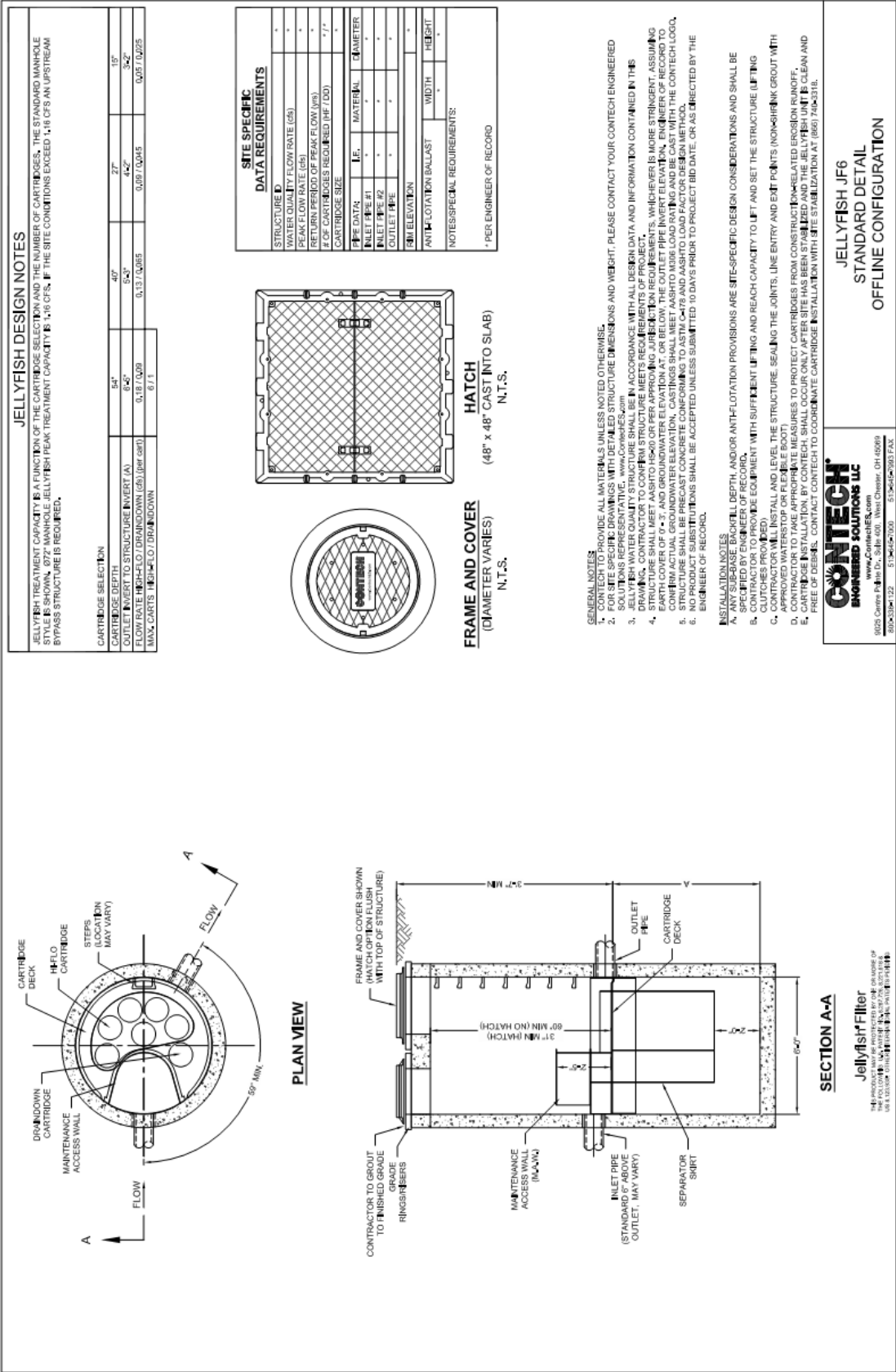
5. ACTIVATION, INSPECTION AND MAINTENANCE

- 5.1. Filter cartridges shall be installed in the cartridge deck after the construction site is fully stabilized and in accordance with the Contech's guidelines and recommendations. Contractor to contact Contech to schedule cartridge delivery and review procedures/requirements to be completed to the device prior to installation of the cartridges and activation of the system.
- 5.2. Contech shall coordinate delivery of filter cartridges and other internal components with contractor. Filter cartridges shall be delivered and installed complete after site is stabilized and unit is ready to accept cartridges. Unit is ready to accept cartridges after it has been cleaned out and any standing water, debris, and other materials have been removed. Contractor shall take appropriate action to protect the filter cartridge receptacles and filter cartridges from damage during construction, and in accordance with Contech's recommendations and guidance. For systems with cartridges installed prior to full site stabilization and prior to system activation, the contractor shall plug inlet and outlet pipes to prevent stormwater and other influent from entering the device. Plugs are to be removed during the activation process.
- 5.3. Durability of membranes are subject to good handling practices during inspection and maintenance (removal, rinsing, and reinsertion) events, and site specific conditions that may have heavier or lighter loading onto the cartridges, and pollutant variability that may impact the membrane structural integrity. Membrane maintenance and replacement shall be in accordance with Contech's recommendations.
- 5.4. Inspection; which includes trash and floatables collection, sediment depth determination, and visible determination of backwash pool depth; shall be easily conducted from grade (outside the structure).
- 5.5. Manual rinsing of the reusable filter cartridges shall promote restoration of the flow capacity and sediment capacity of the filter cartridges, extending cartridge service life.

- 5.6. The filter device shall have a minimum 12 inches (610 mm) of sediment storage depth, and a minimum of 12 inches between the top of the sediment storage and bottom of the filter cartridge tentacles, unless otherwise specified by the design engineer. Variances may have an impact on the total performance and/or longevity between cartridge maintenance/replacement of the device.
- 5.7. Sediment removal from the filter treatment device shall be able to be conducted using a standard maintenance truck and vacuum apparatus, and a minimum one point of entry to the sump that is unobstructed by filter cartridges.
- 5.8. Maintenance access shall have a minimum clear height over all of the filter cartridges (length of cartridge + 6 inches), or be accessible by a hatch or other mechanism that provides vertical clear space over all of the filter cartridges such that the cartridges can be lifted straight vertically out of the receptacles and deck for the entire length of the cartridge.
- 5.9. After construction and installation, and during operation, the device shall be inspected and cleaned as necessary based on Contech's recommended inspection and maintenance guidelines and the local regulatory agency/body.
- 5.10. When replacement membrane filter elements and/or other parts are required, only membrane filter elements and parts approved by Contech for use with the Jellyfish filter shall be installed.
- 5.11. Filter cartridges shall be able to be maintained without the use of additional lifting equipment.
- 5.12. Contech shall provide an Owner's Manual upon request.

6. METHOD OF MEASUREMENT: Item Code 702.9901 "Stormwater Treatment Unit (Jellyfish)" shall be measured per each by the number of units actually installed in accordance with the Plans and/or as directed by the Engineer.

7. BASIS OF PAYMENT: The accepted quantities of Item Code 702.9901 "Stormwater Treatment Unit (Jellyfish)" shall be paid for at the contract unit price per "Each" as listed in the proposal. The price so stated constitutes full and complete compensation for all labor, material, equipment including excavation, excavation support, backfill material, placing and compacting backfill, dewatering, and all other incidentals required to complete the work, complete in place and accepted by the Engineer.



MSE walls installed for temporary use and subsequently removed, or left in place at the Contractor's option with approval of the Engineer, will not be measured for payment under "MECHANICALLY STABILIZED EARTH RETAINING WALL SYSTEM".

"MECHANICALLY STABILIZED EARTH RETAINING WALL SYSTEM – TEMPORARY" will be measured for payment by the number of "Square Yards" of front faces of all walls within neat lines bounded by the top of the leveling pad, the ends of walls and the top or bottom of the reinforcement, actually installed in accordance with the Plans and/or as directed by the Engineer, and are removed or directed by the Engineer to be removed, as part of the final constructed project.

MSE walls installed for temporary use and subsequently left in place at the Contractor's option with approval of the Engineer, will be measured for payment under "MECHANICALLY STABILIZED EARTH RETAINING WALL SYSTEM - TEMPORARY".

BASIS OF PAYMENT: The accepted quantity of "MECHANICALLY STABILIZED EARTH RETAINING WALL SYSTEM" will be paid for at its respective contract unit price per "Square Yards" as listed in the Proposal. The price so stated shall constitute full and complete compensation for all labor, materials, tools and equipment, and all other incidentals required to complete the work as described in these Special Provisions and elsewhere in the Contract Documents, complete in place and accepted by the Engineer. Reinforced Backfill shall be paid for separately under Item Code 202.0800, "Gravel Borrow". Any excavation and backfill required under the wall shall be paid under separate pay items as well. Quantities of MSE Retaining Wall System as shown on the plans may be increased or decreased at the direction of the Engineer based on construction procedures and actual site conditions.

The accepted quantity of "MECHANICALLY STABILIZED EARTH RETAINING WALL SYSTEM - TEMPORARY" will be paid for at its respective contract unit price per "Square Yards" as listed in the Proposal. The price so stated shall constitute full and complete compensation for all labor, materials, tools and equipment, and all other incidentals required to complete the work, including removal, as described in these Special Provisions and elsewhere in the Contract Documents, complete in place and subsequently removed, and accepted by the Engineer. Reinforced Backfill shall be paid for separately under Item Code 202.0800, "Gravel Borrow". Any excavation and backfill required under the wall shall be paid under separate pay items as well. Quantities of Temporary MSE Retaining Wall System as shown on the plans may be increased or decreased at the direction of the Engineer based on construction procedures and actual site conditions.

CODE 808.9901
CONCRETE SUPERSTRUCTURE CLASS HP 3/8" BRIDGE DECK CLOSURE POURS

All work under this item shall be in accordance with Section 808 and 601 of the Rhode Island Standard Specifications for Road and Bridge Construction, 2004 Edition (Amended March 2018 and Compilations), revised as follows:

MATERIALS

All concrete for closure pours shall be Class HP High Early Strength. Class HP High Early Strength shall conform to the requirements of Class HP concrete as specified in Section 600 of the Standard Specifications. Class HP High Early Strength Concrete shall reach a minimum compressive strength (f'_c) of 1000psi within 8 hours of placement and 5000psi within 28 days of placement. No flash set will be permitted. Prequalification for shrinkage and permeability will not be required. Acceptance of material or construction shall be in accordance with Section 601 of the Standard Specifications and shall be based on the 28-day compressive strength. Additional sampling and testing to confirm interim compressive strength will be required earlier than the specified 28-day compressive strength and/or at 4 hours, as determined by the Engineer, as a prerequisite to subsequent construction activities shall be the Contractor's responsibility as part of the Contractor's quality/process control system.

CONSTRUCTION METHODS

The concrete within the deck closure pours shall develop a minimum concrete strength (f'_c) of 1000psi prior to subjecting it to loading from subsequent construction activities, including, but not limited to vehicle and construction equipment loading, installing materials or storage of materials. Concrete shall reach 1000psi before the bridge is opened to traffic.

The closure pour shall be to one-half inch (1/2"), with tolerance of minus 0, plus 1/4", above the proposed final top of deck grades similar to the rest of the bridge deck. The rest of the bridge deck and the length of the closure pour shall be ground to remove the extra 1/2" of concrete under the Item **814.0100 DIAMOND GRINDING OF CONCRETE BRIDGE DECKS.**

METHOD OF MEASUREMENT

"CONCRETE SUPERSTRUCTURE CLASS HP 3/8" BRIDGE DECK CLOSURE POURS" will be measured by the number of cubic yards of concrete actually provided in accordance with the Plans and/or as directed by the Engineer.

a. Deductions. Deduction in volume will be allowed for the following elements embedded in concrete:

1. The volume of major structural steel with the exception of steel sheet piling.
2. The volume of timber piles on the basis of 0.8 cubic feet per linear foot of pile.
3. The volume of concrete on combination piles.

No deduction in volume will be allowed for reinforcing steel, floor drains, weep holes, drainage holes, expansion joint material and minor structural elements embedded in concrete.

BASIS OF PAYMENT

The accepted quantities of "CONCRETE SUPERSTRUCTURE CLASS HP 3/8" BRIDGE DECK

CLOSURE POURS" will be paid for at the respective contract unit prices per cubic yard as listed in the Proposal. The prices so-stated constitute full and complete compensation for all labor, materials and equipment, and all incidentals required to finish the work, complete and accepted by the Engineer

SECTION 825
PAINTING STRUCTURAL STEEL

825.02.2 Topcoat Color Add the following:

Topcoat Color shall be semi-gloss and match Federal Standard 25183.

Bridge Railing shall be semi-gloss and match Federal Standard 27038.

CODE 938.1000
PRICE ADJUSTMENTS

DESCRIPTION

- a. Liquid Asphalt Cement.** The Base Price of Liquid Asphalt Cement as required to implement **Subsection 938.03.1** of the Standard Specifications is \$547.50 per ton as of April 22, 2019.
- b. Diesel Fuel.** The Base Price of Diesel Fuel as required to implement **Subsection 938.03.2** of the Standard Specifications is \$2.2234 per gallon as of April 22, 2019.
- c. Steel.** The Base Prices of Steel (effective January 2019) as required to implement Subsection 938.03.3 of the Standard Specifications are listed in the following table.

01-31-2019

January 2019 Structural Steel & Rebar Base Prices for Contracts
Note 1: This list goes into effect January 1, 2019 and will remain in effect until revised.
Note 2: This list supersedes and replaces any earlier list.
Note 3: This list is based on the January 2019 Worksheet.

ITEM NO.	DESCRIPTION	NOVEMBER PRICE		NOVEMBER PRICE	
		PER POUND		PER KILOGRAM	
1	ASTM A615/A615M Grade 60 (AASHTO M31 Grade 420) Reinforcing Steel	\$ 0.40	\$	\$ 0.88	
2	ASTM A27 (AASHTO M103) Steel Castings: H-Pile Points & Pipe Pile Shoes (See Note (1) below.)	\$ 0.54	\$	\$ 1.19	
3	ASTM A668 / A668M (AASHTO M102) Steel Forgings	\$ 0.54	\$	\$ 1.19	
4	ASTM A108 (AASHTO M169) Steel Forgings for Shear Studs	\$ 0.60	\$	\$ 1.33	
5	ASTM A709/A709M Grade 36 / AASHTO M270M/M270 Grade 250 Structural Steel Plate	\$ 0.65	\$	\$ 1.44	
6	ASTM A709/A709M Grade 36 / AASHTO M270M/M270 Grade 250 Structural Steel Shapes	\$ 0.46	\$	\$ 1.02	
7	ASTM A709/A709M Grade 50 / AASHTO M270M/M270 Grade 345 Structural Steel Plate	\$ 0.58	\$	\$ 1.27	
8	ASTM A709/A709M Grade 50 / AASHTO M270M/M270 Grade 345 Structural Steel Shapes	\$ 0.46	\$	\$ 1.02	
9	ASTM A709/A709M Grade 50WT / AASHTO M270M/M270 Grade 345WT Structural Steel Plate	\$ 0.68	\$	\$ 1.50	
10	ASTM A709/A709M Grade 50WT / AASHTO M270M/M270 Grade 345WT Structural Steel Shapes	\$ 0.52	\$	\$ 1.14	
11	ASTM A709/A709M Grade 50W / AASHTO M270M/M270 Grade 345W Structural Steel Plate	\$ 0.62	\$	\$ 1.36	
12	ASTM A709/A709M Grade 50W / AASHTO M270M/M270 Grade 345W Structural Steel Shapes	\$ 0.48	\$	\$ 1.05	
13	ASTM A709/A709M Grade HPS 50W / AASHTO M270M/M270 Grade HPS 345W Structural Steel Plate	\$ 0.69	\$	\$ 1.53	
14	ASTM A709/A709M Grade HPS 70W / AASHTO M270M/M270 Grade HPS 485W Structural Steel Plate	\$ 0.73	\$	\$ 1.61	
15	ASTM A514/A514M-05 Grade HPS 100W / AASHTO M270M/M270 Grade HPS 690W Structural Steel Plate	\$ 1.12	\$	\$ 2.46	
16	ASTM A276 Type 316 Stainless Steel	\$ 3.32	\$	\$ 7.32	
17	ASTM A240 Type 316 Stainless Steel	\$ 3.32	\$	\$ 7.32	
18	ASTM A148 Grade 80/50 Steel Castings (See Note (1) below.)	\$ 1.15	\$	\$ 2.54	
19	AASHTO M270M/M270 Grade 345W Structural Steel Plate - same as Item #11.	Same as Item #11.			
20	AASHTO M270M/M270 Grade HPS 345W Structural Steel Plate - same as Item #13.	Same as Item #13.			
21	AASHTO M270M/M270 Grade 250 Structural Steel Plate - same as Item #5.	Same as Item #5.			
22	ASTM A53 Grade B Structural Steel Pipe	\$ 0.74	\$	\$ 1.63	
23	ASTM A500 Grades A, B, 36 & 50 Structural Steel Pipe	\$ 0.74	\$	\$ 1.63	
24	ASTM A252, Grades 240 (36 KSI) & 414 (60 KSI) Pipe Pile	\$ 0.57	\$	\$ 1.26	
25	ASTM 252, Grade 2 Permanent Steel Casing	\$ 0.57	\$	\$ 1.26	
26	ASTM A36 (AASHTO M183) H-piles, steel supports and sign supports	\$ 0.50	\$	\$ 1.09	
27	ASTM A328 / A328M, Grade 50 (AASHTO M202) Steel Sheetpiling	\$ 1.09	\$	\$ 2.41	
28	ASTM A572 / A572M, Grade 50 Sheetpiling	\$ 1.09	\$	\$ 2.40	
29	ASTM A36/36M, Grade 50	\$ 0.64	\$	\$ 1.41	
30	ASTM A570, Grade 50	\$ 0.64	\$	\$ 1.40	
31	ASTM A572 (AASHTO M223), Grade 50 H-Piles	\$ 0.47	\$	\$ 1.03	
32	ASTM A1085 Grade A (50 KSI) Steel Hollow Structural Sections (HSS), heat-treated per ASTM A1085 Supplement S1	\$ 0.74	\$	\$ 1.64	

NOTES:

(1) Steel Castings are generally used only on moveable bridges. Cast iron frames, grates and pipe are not "steel" castings and will not be considered for price adjustments.

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201.0320	CLEARING AND GRUBBING	1
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201.0406	REMOVE AND DISPOSE HIGHWAY BOUNDS	2
201.0409	REMOVE AND DISPOSE FLEXIBLE PAVEMENT	2
201.0410	REMOVE AND DISPOSE CATCH BASINS	2
201.0414	REMOVE AND DISPOSE PIPE - ALL SIZES	2
201.0415	REMOVE AND DISPOSE GUARDRAIL AND POST ALL TYPES	3
201.0419	REMOVE AND DISPOSE FENCE	3
201.0428	REMOVE AND DISPOSE FRAME AND GRATE OR FRAME AND COVER	3
201.0432	REMOVE AND DISPOSE HEADWALL	3
201.0613	REMOVE AND STOCKPILE LIGHT STANDARDS	4
201.0616	REMOVE AND DISPOSE LIGHT STANDARD FOUNDATIONS	4
201.0622	REMOVE AND DISPOSE OVERHEAD SIGN PANEL	4
201.9902	INSPECTION AND TESTING FOR ASBESTOS CONTAINING MATERIALS	4
201.9903	REMOVE AND DISPOSAL OF ASBESTOS CONTAINING MATERIALS	4
202.0100	EARTH EXCAVATION	5
202.0700	COMMON BORROW	5
203.0100	STRUCTURAL EXCAVATION EARTH	6
203.0220	STRUCTURAL EXCAVATION ROCK MECHANICAL	6
203.0650	CRUSHED STONE FILL UNDER STRUCTURES	6
204.0100	TRIMMING AND FINE GRADING	6
205.0270	TRENCH ROCK EXCAVATION-MECHANICAL (0-7')	7
206.0312	COMPOST FILTER SOCK 12 INCH DIAMETER	7
209.0110	BALED HAY CATCH BASIN INLET PROTECTION STANDARD 9.8.0	7
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301.9902	STONE FILL FOR PROTECTIVE SLEEVES	8
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403.0300	ASPHALT EMULSION TACK COAT	10
410.1000	TEMPORARY PATCHING MATERIAL/TRENCHES	11
603.1000	CONTROLLED LOW STRENGTH MATERIAL	11
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701.9903	12" DUCTILE IRON WATER PIPE - INSULATED - PROPOSED	13
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701.9905	INSTALL 6" GAS MAIN ACROSS BRIDGE	13
701.9906	INSTALL 6" GAS MAIN ACROSS TEMPORARY UTILITY BRIDGE	13
701.9907	INSTALL 6" GAS MAIN	13
702.0516	FRAME AND GRATE, HIGH CAPACITY, STANDARD 6.3.4	14
702.0517	FRAME AND GRATE, STANDARD 6.3.2	14
702.0522	FRAME AND COVER STANDARD 6.2.1	14
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708.9040	CLEANING AND FLUSHING PIPE ALL SIZES	16
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Item No.	Item Code	Description	UM	Qty.	Pay Code	Seq. No.
010	201.0415	REMOVE AND DISPOSE GUARDRAIL AND POST ALL TYPES	LF			
		DIVISION ST PERMANENT				
		47+95.07 TO 49+00.00, RT		110.00	0011	01
		48+48.00 TO 48+97.00, LT		50.00	0011	01
		51+03.44 TO 51+50.81, RT		50.00	0011	01
		51+05.46 TO 52+02.39, LT		110.00	0011	01
		ROUTE 4 PERMANENT				
		NORTHBOUND		1,425.00	0011	01
		SOUTHBOUND		1,400.00	0011	01
Item 201.0415 Total:				3,145.00		
011	201.0419	REMOVE AND DISPOSE FENCE	LF			
		DIVISION STREET				
		STA 47+29 TO 48+77, LT		160.00	0011	01
		STA 51+56 TO 52+74, LT		120.00	0011	01
Item 201.0419 Total:				280.00		
012	201.0428	REMOVE AND DISPOSE FRAME AND GRATE OR FRAME AND COVER	EACH			
		DIVISION ST PERMANENT				
		47+00 Lt		1.00	0011	01
		48+52, LT		1.00	0011	01
		48+52, RT		1.00	0011	01
		53+48, LT		1.00	0011	01
		53+48, RT		1.00	0011	01
		53+59 Lt		1.00	0011	01
		ROUTE 4				
		428+22.19		1.00	0011	01
Item 201.0428 Total:				7.00		
013	201.0432	REMOVE AND DISPOSE HEADWALL	EACH			
		DIVISION STREET				

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Item No.	Item Code	Description	UM	Qty.	Pay Code	Seq. No.
013	201.0432 Cont.	STA 48+92 LT		1.00	0011	01
		STA 49+12 RT		1.00	0011	01
		STA 50+88 LT		1.00	0011	01
Item 201.0432 Total:				3.00		

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Item No.	Item Code	Description	UM	Qty.	Pay Code	Seq. No.
018	201.9903	Cont.	Item 201.9903 Total:		200.00	
019	202.0100	EARTH EXCAVATION	CY			
		DIVISION ST PERMANENT				
		44+94.92 TO 48+84.92		4,560.00	0011	01
		DIVISION ST TEMPORARY				
		144+72.20 TO 148+9302		1,935.00	0011	01
		TEMP ROADWAY FILL REMOVAL		2,450.00	0011	01
		TEMP ROADWAY GRAVEL REMOVAL		1,685.00	0011	01
		INFILTRATION BASIN				
		BR 760		480.00	0011	01
		ROUTE 4 TEMPORARY				
		TEMP ROADWAY FILL REMOVAL		475.00	0011	01
		TEMP ROADWAY GRAVEL REMOVAL		510.00	0011	01
Item 202.0100 Total:				12,095.00		
020	202.0700	COMMON BORROW	CY			
		BRIDGE 760				
		MISC			0011	01
		PROP EAST ABUT			0011	01
		PROP ROADWAY			0011	01
		PROP WEST ABUT			0011	01
		TEMP AND PROP PIER		500.00	0011	01
		TEMP EAST ABUT			0011	01
		TEMP WEST ABUT			0011	01
		DIVISION ST FINAL ROADWAY				
		FINAL FILL		90.00	0011	01
		DIVISION ST TEMP ROADWAY				
		TEMP FILL		2,820.00	0011	01
		ROUTE 4 TEMPORARY				
		WIDENING		475.00	0011	01
Item 202.0700 Total:				3,885.00		

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Item No.	Item Code	Description	UM	Qty.	Pay Code	Seq. No.
021	203.0100	STRUCTURAL EXCAVATION EARTH	CY			
		BRIDGE 760				
		MISC		95.00	0011	01
		PROP EAST ABUT		1,655.00	0011	01
		PROP WEST ABUT		3,463.00	0011	01
		TEMP AND PROP PIER		773.00	0011	01
		TEMP EAST ABUT		1,035.00	0011	01
		TEMP EAST ABUT REMOVAL		992.00	0011	01
		TEMP WEST ABUT		2,020.00	0011	01
		TEMP WEST ABUT REMOVED		1,967.00	0011	01
Item 203.0100 Total:				12,000.00		
022	203.0220	STRUCTURAL EXCAVATION ROCK	CY			
		MECHANICAL				
		BRIDGE 760				
		MISC		95.00	0011	01
		PROP EAST ABUT		160.00	0011	01
		PROP WEST ABUT		342.00	0011	01
		TEMP AND PROP PIER		83.00	0011	01
		TEMP EAST ABUT		54.00	0011	01
		TEMP WEST ABUT		866.00	0011	01
Item 203.0220 Total:				1,600.00		
023	203.0650	CRUSHED STONE FILL UNDER STRUCTURES	CY			
		BRIDGE 760				
		EAST ABUT		1,000.00	0011	01
Item 203.0650 Total:				1,000.00		
024	204.0100	TRIMMING AND FINE GRADING	SY			
		PROJECT WIDE				
		PROJECT WIDE		7,150.00	0011	01
Item 204.0100 Total:				7,150.00		

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Item No.	Item Code	Description	UM	Qty.	Pay Code	Seq. No.
025	205.0270	TRENCH ROCK EXCAVATION-MECHANICAL (0-7')	CY			
		BRIDGE 760				
		BR 760		30.00	0011	01
Item 205.0270 Total:				30.00		
026	206.0312	COMPOST FILTER SOCK 12 INCH DIAMETER	LF			
		DIVISION ST TEMPORARY				
		45+25 TO 49+05, RT		440.00	0011	01
		45+75 TO 48+95, LT		465.00	0011	01
		50+68.12 TO 55+42.55, LT		610.00	0011	01
		50+95 TO 53+25, RT		300.00	0011	01
		53+57.41 TO 55+77.11, RT		225.00	0011	01
		ROUTE 4				
		425+58 TO STA 432+92		800.00	0011	01
		426+94 TO STA 435+14		925.00	0011	01
		428+53 TO STA 428+53		125.00	0011	01
		431+36 TO STA 431+36		110.00	0011	01
Item 206.0312 Total:				4,000.00		
027	209.0110	BALED HAY CATCH BASIN INLET PROTECTION STANDARD 9.8.0	LF			
		BRIDGE 760				
		45+57.37 LT		12.00	0011	01
		47+04.59 LT		12.00	0011	01
		47+04.59 RT		12.00	0011	01
		48+50.78 LT		12.00	0011	01
		48+51.83 RT		12.00	0011	01
		52+10.96 LT		12.00	0011	01
		52+11.26 RT		12.00	0011	01
		53+00.00 RT		12.00	0011	01
		53+48.48 LT		12.00	0011	01

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Item No.	Item Code	Description	UM	Qty.	Pay Code	Seq. No.
035	403.0300	Cont. OVERLAY: SOUTHBOUND		6,545.00	0011	01
Item 403.0300 Total:				40,190.00		
036	410.1000	TEMPORARY PATCHING	TON			
		MATERIAL/TRENCHES				
		PROJECT WIDE				
		5% OF 401.1000		150.00	0011	01
		5% OF 401.2000		80.00	0011	01
		5% OF 401.3000		95.00	0011	01
Item 410.1000 Total:				325.00		
037	603.1000	CONTROLLED LOW STRENGTH MATERIAL	CY			
		BRIDGE 760				
		ABUTMENT PILES		90.00	0011	01
Item 603.1000 Total:				90.00		
038	701.0612	REINFORCED CONCRETE PIPE M 170	LF			
		CLASS V 12 INCH				
		DIVISION STREET				
		STA 45+57.37 LT TO 47+04.59		147.00	0011	01
		LT				
		STA 47+04.59 LT TO 47+04.59		146.00	0011	01
		LT				
		STA 47+04.59 LT TO 48+51.83		67.00	0011	01
		RT				
		STA 47+04.59 RT TO 48+51.83		147.00	0011	01
		RT				
		STA 52+10.96 LT TO 53+00.00		88.00	0011	01
		LT				
		STA 52+10.96 LT TO 54+93.32		13.00	0011	01
		LT				
		STA 52+11.26 RT TO 52+10.96		67.00	0011	01
		LT				

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Item No.	Item Code	Description	UM	Qty.	Pay Code	Seq. No.
038	701.0612	Cont.				
		STA 53+00.00 RT TO 54+93.32		67.00	0011	01
		LT				
		ROUTE 4 PERMANENT				
		NORTHBOUND, RT		228.00	0011	01
Item 701.0612 Total:				970.00		
039	701.0618	REINFORCED CONCRETE PIPE M 170	LF			
		CLASS V 18 INCH				
		DIVISION STREET				
		STA 48+51.83 RT TO 54+93.32		20.00	0011	01
		LT				
		STA 52+10.96 LT TO 54+93.32		32.00	0011	01
		LT				
		STA 53+00.00 LT TO 52+10.96		48.00	0011	01
		LT				
		STA 54+93.32 LT TO 54+93.32		70.00	0011	01
		LT				
Item 701.0618 Total:				170.00		
040	701.5812	12 INCH DUCTILE IRON WATER PIPE	LF			
		CLASS 56, MECHANICAL JOINT				
		DIVISION STREET				
		STA 47+86 TO 51+82			0011	01
Item 701.5812 Total:				**DELETED**		
041	701.8112	12 INCH GATE VALVE AND BOX	EACH			
		BR 760				
		EAST AND WEST PROP. LOCATIONS		8.00	0011	01
Item 701.8112 Total:				8.00		
042	701.9901	12" DUCTILE IRON WATER PIPE -	LF			
		INSULATED - TEMPORARY				
		BR 760				

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Item No.	Item Code	Description	UM	Qty.	Pay Code	Seq. No.
048	701.9907 Cont.	BR 760				
		DIVISION ST		600.00	0011	01
		Item 701.9907 Total:		600.00		
049	702.0516	FRAME AND GRATE, HIGH CAPACITY, STANDARD 6.3.4	EACH			
		DIVISION STREET PERMANENT				
		STA 48+50.78 TO 53+58.49		13.00	0011	01
		Item 702.0516 Total:		13.00		
050	702.0517	FRAME AND GRATE, STANDARD 6.3.2	EACH			
		DIVISION STREET PERMANENT				
		STA 57+57.37 TO 48+51.83		5.00	0011	01
		Item 702.0517 Total:		5.00		
051	702.0522	FRAME AND COVER STANDARD 6.2.1	EACH			
		DIVISION STREET PERMANENT				
		40+60		1.00	0011	01
		53+00		1.00	0011	01
		RT 4 PERMANENT				
		428+22.19 LT		1.00	0011	01
		NB AND SB, RT AND LT		2.00	0011	01
		Item 702.0522 Total:		5.00		
052	702.0542	GRANITE APRON STONE 5FT. STANDARD 7.3.7	EACH			
		BRIDGE 760				
		45+57.37 LT		1.00	0011	01
		47+04.59 LT		1.00	0011	01
		47+04.59 RT		1.00	0011	01
		48+50.78 LT		1.00	0011	01
		48+51.83 RT		1.00	0011	01
		52+10.96 LT		1.00	0011	01

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Item No.	Item Code	Description	UM	Qty.	Pay Code	Seq. No.
052	702.0542	Cont.	52+11.26 RT	1.00	0011	01

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Item No.	Item Code	Description	UM	Qty.	Pay Code	Seq. No.
052	702.0542 Cont.	53+00.00 RT		1.00	0011	01
		53+48.48 LT		1.00	0011	01
		53+58.49 RT		1.00	0011	01
		54+93.32 LT		1.00	0011	01
Item 702.0542 Total:				11.00		
053	702.0630	PRECAST MANHOLE 4' DIAMETER	EACH			
		STANDARD 4.2.0				
		DIVISION STREET PERMANENT				
		40+60		1.00	0011	01
		53+00		1.00	0011	01
		ROUTE 4 PERMANENT				
		NORTHBOUND		1.00	0011	01
		SOUTHBOUND		1.00	0011	01
Item 702.0630 Total:				4.00		
054	702.0704	CATCH BASIN TYPE 'F' SQUARE	EACH			
		STANDARD 3.3.2				
		DIVISION STREET PERMANENT				
		45+57.37 LT		1.00	0011	01
		47+04.59 LT		1.00	0011	01
		47+04.59 RT		1.00	0011	01
		53+48.48 LT		1.00	0011	01
Item 702.0704 Total:				4.00		
055	702.0717	DOUBLE GRATE CATCH BASIN STANDARD	EACH			
		3.3.5				
		DIVISION STREET PERMANENT				
		48+50.78 LT		1.00	0011	01
		48+51.83 RT		1.00	0011	01
		52+10.96 LT			0011	01
		52+11.26 RT			0011	01
		53+00 RT		1.00	0011	01

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Item No.	Item Code	Description	UM	Qty.	Pay Code	Seq. No.
055	702.0717	Cont.	Item 702.0717 Total:	3.00		
056	702.0722	SOLID BLOCK SHALLOW TYPE "F" SQUARE CATCH BASIN STANDARD 3.5.0 DIVISION STREET PERMANENT 54+93.32 LT	EACH	1.00	0011	01
		Item 702.0722 Total:		1.00		
057	702.0725	SOLID BLOCK SHALLOW DOUBLE GRATE CATCH BASIN STANDARD 3.5.2 DIVISION STREET PERMANENT 53+58.49 RT	EACH	1.00	0011	01
		Item 702.0725 Total:		1.00		
058	702.9901	MODIFIED PRECAST PERPENDICULAR DOUBLE GRATE CATCH BASIN 4' SQUARE BRIDGE 760 52+10.97 LT 52+11.27 RT	EACH	1.00 1.00	0011 0011	01 01
		Item 702.9901 Total:		2.00		
059	706.9000	PLUG AND CAP PIPE ALL SIZES DIVISION STREET PERMANENT 430+50 RT 430+75 LT	EACH	1.00 1.00	0011 0011	01 01
		Item 706.9000 Total:		2.00		
060	708.9040	CLEANING AND FLUSHING PIPE ALL SIZES DIVISION ST PERMANENT 45+20.00 TO 45+35.00 RT 53+59.00 TO 53+69.00	LF	35.00 25.00	0011 0011	01 01
		Item 708.9040 Total:		60.00		

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Item No.	Item Code	Description	UM	Qty.	Pay Code	Seq. No.
065	802.9901 Cont.	BRIDGE 760				
		UTILITY BRIDGE		1.00	0011	01
		Item 802.9901 Total:		1.00		
066	803.0000	REMOVAL OF EXISTING BRIDGES	LS			
		DIVISION STREET				
		48+69.34 TO 51+19.34		1.00	0011	01
		Item 803.0000 Total:		1.00		
067	803.0500	TEMPORARY DECK UNDERSIDE AND SIDE	SF			
		PROTECTIVE SHIELDING				
		DIVISION STREET				
		48+89.34 TO 50+99.34		19,300.00	0011	01
		Item 803.0500 Total:		19,300.00		
068	803.9901	REMOVAL OF TEMPORARY BRIDGE	LS			
		ELEMENTS				
		BRIDGE 760				
		ABUTMENTS		1.00	0011	01
		Item 803.9901 Total:		1.00		
069	804.9901	STEEL H PILES, FURNISH AND PLACE	LF			
		14IN 117 LB/FT				
		BRIDGE 760				
		EAST AND WEST ABUT		640.00	0011	01
		Item 804.9901 Total:		640.00		
070	804.9902	CORRUGATED PLASTIC PROTECTIVE	LF			
		SLEEVES				
		BRIDGE 760				
		EAST AND WEST ABUT		900.00	0011	01
		Item 804.9902 Total:		900.00		

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Item No.	Item Code	Description	UM	Qty.	Pay Code	Seq. No.
071	804.9903	STEEL H PILES FURNISH AND PLACE 14 LF IN 117 LB/FT - TEMPORARY BRIDGE 760 EAST AND WEST ABUT		560.00	0011	01
Item 804.9903 Total:				560.00		
072	804.9905	PREBORING BRIDGE 760 EAST ABUT WEST ABUT	EACH	25.00 25.00	0011 0011	01 01
Item 804.9905 Total:				50.00		
073	805.4100	SOLDIER PILES DRIVE, STEEL BRIDGE 760 EAST ABUT WEST ABUT	EA	10.00 10.00	0011 0011	01 01
Item 805.4100 Total:				20.00		
074	805.4400	TIMBER LAGGING - INSTALLED BRIDGE 760 EAST ABUT WEST ABUT	SF	785.00 1,515.00	0011 0011	01 01
Item 805.4400 Total:				2,300.00		
075	805.9901	MSE WRAP FACE RETAINING WALL SYSTEM SY BRIDGE 760 BACKWALLS FRONT FACE EAST ABUT FRONT FACE WEST ABUT SE WINGWALL SW WINGWALL		618.00 120.00 230.00 10.00 42.00	0011 0011 0011 0011 0011	01 01 01 01 01
Item 805.9901 Total:				1,020.00		

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Item No.	Item Code	Description	UM	Qty.	Pay Code	Seq. No.
076	805.9902	MSE WRAP FACE RETAINING WALL	SY			
		SYSTEM - TEMPORARY				
		BRIDGE 760				
		TEMP BACKWALLS		701.00	0011	01
		TEMP EAST ABUT FRONT FACE		119.00	0011	01
		TEMP NORTHEAST WINGWALL		33.00	0011	01
		TEMP NW WINGWALL		170.00	0011	01
		TEMP WEST ABUT FRONT FACE		277.00	0011	01
Item 805.9902 Total:				1,300.00		
077	805.9903	MSE WALLS PRECAST CONCRETE FACING	SY			
		BRIDGE 760				
		BACKWALL			0011	01
		FRONT FACE EAST ABUT		125.00	0011	01
		FRONT FACE WEST ABUT		275.00	0011	01
		SE WINGWALL			0011	01
		SW WINGWALL			0011	01
Item 805.9903 Total:				400.00		
078	808.0322	CONCRETE SUBSTRUCTURE CLASS HP	CY			
		3/4" END POSTS				
		DIVISION STREET				
		48+69.34 TO 51+19.34		10.00	0011	01
Item 808.0322 Total:				10.00		
079	808.0501	CONCRETE SUBSTRUCTURE CLASS XX	CY			
		3/4" FOOTINGS				
		BRIDGE 760				
		PIER FOOTING		134.00	0011	01
		ROCK SOCKETS		50.00	0011	01
		TEMP FOOTING		140.00	0011	01
Item 808.0501 Total:				324.00		

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Item No.	Item Code	Description	UM	Qty.	Pay Code	Seq. No.
084	808.1502	CONCRETE SUPERSTRUCTURE CLASS HP 3/4'' BRIDGE SIDEWALKS DIVISION STREET 48+86.84 TO 51+01.84	CY	85.00	0011	01
Item 808.1502 Total:				85.00		
085	808.1503	CONCRETE SUPERSTRUCTURE CLASS HP 3/4'' PARAPETS DIVISION STREET 48+86.84 TO 51+01.84	CY	25.00	0011	01
Item 808.1503 Total:				25.00		
086	808.1640	PREFORMED POLYETHYLENE FOAM JOINT FILLER 1/2'' BRIDGE 760 APP SLAB AND CURTAIN WALL JT CHEEKWALL AND END DIAPH JT E&W ABUTMENT TAB	SF	90.00 117.00 93.00	0011 0011 0011	01 01 01
Item 808.1640 Total:				300.00		
087	808.1642	PREFORMED POLYETHYLENE FOAM JOINT FILLER 1'' BRIDGE 760 TOP OF BACKWALL E&W	SF	400.00	0011	01
Item 808.1642 Total:				400.00		
088	808.9901	CONCRETE SUPERSTRUCTURE CLASS HP 1/2" BRIDGE DECKS CLOSURE POURS BRIDGE 760 EAST AND WEST ABUTMENTS	CY	20.00	0011	01
Item 808.9901 Total:				20.00		
089	810.0200	STANDARD BARS GRADE 60	LBS			

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Item No.	Item Code	Description	UM	Qty.	Pay Code	Seq. No.
166	T16.0100	Cont. BRIDGE 760				
		PROJECT LIMITS		24.00	0011	01
Item T16.0100 Total:				24.00		
167	T17.0100	OVERHEAD SIGN PANELS	SF			
		BRIDGE 760				
		EXIT 8		20.00	0011	01
		EXIT 8B		20.00	0011	01
		MERGE AHEAD		176.00	0011	01
		ROUTE 4 401 TO ROUTE 2		212.00	0011	01
		ROUTE 4 SOUTH		132.00	0011	01
Item T17.0100 Total:				560.00		
168	T17.0203	OVERHEAD SIGN STRUCTURE 26-30 FOOT EACH				
		CANTILEVER - STEEL				
		BRIDGE 760				
		ROUTE 4 SB		1.00	0011	01
Item T17.0203 Total:				1.00		
169	T17.0211	OVERHEAD SIGN STRUCTURE 66-70 FOOT EACH				
		SPAN - STEEL				
		BRIDGE 760				
		PROJECT LIMITS		1.00	0011	01
Item T17.0211 Total:				1.00		
170	T17.9901	OVERHEAD STRUCTURE 81' TO 85' SPAN EACH				
		- STEEL				
		DIVISION STREET				
		BR 760			0011	01
Item T17.9901 Total:				**DELETED**		
171	T20.1000	REMOVE EXISTING PAVEMENT MARKINGS	LF			
		DIVISION ST PERMANENT				

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Estimate Name - Addendum No. 2 to Bridge 760 - Advertising
R.I. Contract No. - 2018-CB-088
FAP Nos: BRO-0760-003

Item No.	Item Code	Description	UM	Qty.	Pay Code	Seq. No.
171	T20.1000	Cont.				
		44+48.20 TO 55+77.12, LT		3,450.00	0011	01
		44+48.20 TO 55+77.12, RT		3,670.00	0011	01

Distribution of Quantities

Project Name - Bridge Group 58A - Division St
 Estimate Name - Addendum No. 2 to Bridge 760 - Advertising
 R.I. Contract No. - 2018-CB-088
 FAP Nos: BRO-0760-003

Item No.	Item Code	Description	UM	Qty.	Pay Code	Seq. No.
174	T20.2014 Cont.	ROUTE 4 PERMANENT				
		NORTHBOUND		1,100.00	0011	01
		SOUTHBOUND		1,065.00	0011	01
Item T20.2014 Total:				4,480.00		
S175	T20.2206	6 INCH TEMPORARY EPOXY RESIN	LF			
		PAVEMENT MARKINGS WHITE				
		DIVISION ST TEMPORARY				
		144+50.00 TO 156+08.50, LT		3,260.00	0011	01
		144+50.00 TO 156+08.50, RT		3,010.00	0011	01
Item T20.2206 Total:				6,270.00		
S176	T20.2306	6 INCH TEMPORARY EPOXY RESIN	LF			
		PAVEMENT MARKINGS YELLOW				
		DIVISION ST TEMPORARY				
		144+50.00 TO 156+08.50, LT		1,160.00	0011	01
		144+50.00 TO 156+08.50, RT		1,210.00	0011	01
		ROUTE 4 TEMPORARY				
		STAGE 2 NORTHBOUND		1,050.00	0011	01
		STAGE 2 NORTHBOUND EXIT		305.00	0011	01
		STAGE 2 SOUTHBOUND		1,045.00	0011	01
		STAGE 2 SOUTHBOUND EXIT		475.00	0011	01
Item T20.2306 Total:				5,245.00		
177	201.0412	REMOVE AND DISPOSE MANHOLE	EACH			
		DIVISION ST PERMANENT				
		428+22.19 LT		1.00	0011	01
Item 201.0412 Total:				1.00		
178	201.0623	REMOVE AND DISPOSE OVERHEAD SIGN	EACH			
		STRUCTURE				
		ROUTE 4				
		428+60		1.00	0011	01

Distribution of Quantities

Project Name - Bridge Group 58A - Division St
 Estimate Name - Addendum No. 2 to Bridge 760 - Advertising
 R.I. Contract No. - 2018-CB-088
 FAP Nos: BRO-0760-003

Item No.	Item Code	Description	UM	Qty.	Pay Code	Seq. No.
178	201.0623	Cont.		1.00		
Item 201.0623 Total:				1.00		
179	202.0800	GRAVEL BORROW	CY			
		BRIDGE 760				
		PROP EAST ABUT		1,580.00	0011	01
		PROP WEST ABUT		2,595.00	0011	01
		TEMP EAST ABUT		900.00	0011	01
		TEMP WEST ABUT		1,925.00	0011	01
Item 202.0800 Total:				7,000.00		
180	702.9902	STORMWATER TREATMENT UNIT	EACH			
		(JELLYFISH)				
		DIVISION ST PERMANENT				
		48+63.43 RT		1.00	0011	01
		ROUTE 4				
		428+22.19 LT		1.00	0011	01
Item 702.9902 Total:				2.00		
181	T16.0300	GROUND MOUNTED PRIMARY DIRECTIONAL	EACH			
		SIGN POST-STEEL BREAKAWAY				
		DIVISION ST PERMANENT				
		BRIDGE 760		2.00	0011	01
Item T16.0300 Total:				2.00		