February 7, 2018

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATION
DEPARTMENT OF ADMINISTRATION

DIVISION OF PURCHASES BID NO. 7584481

RHODE ISLAND DEPARTMENT OF TRANSPORTATION

RHODE ISLAND CONTRACT NO.2017-CB-078

FEDERAL-AID PROJECT NO. FAP Nos: BHO-0425(001)

Centerville Road Bridge No. 425 Rehabilitation

Centerville Road (Rte. 117) at Bald Hill Road (Rte. 2)

CITY/TOWN OF Warwick

COUNTY OF KENT

NOTICE TO PROSPECTIVE BIDDERS

ADDENDUM NO. 3 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. General Provisions - Contract Specific

1. CS-3

   Delete page CS-3 in its entirety and replace it with revised page CS-3(R-1) attached to this Addendum No. 3. The utility working time has been revised.

2. APPENDIX B

   Delete APPENDIX B in its entirety and replace it with revised APPENDIX B(R-1) attached to this Addendum No. 3. New National Grid Gas Documents are included.

B. Job Specific Specifications

1. JS-ii

   Delete page JS-ii in its entirety and replace it with revised page JS-ii(R-1) attached to this Addendum No. 3. Codes 702.9910 and 702.9911 have been added.

2. JS-47

   Delete page JS-47 in its entirety and replace it with revised page JS-47(R-1) attached to this Addendum No. 3. Price adjustments have been revised.

3. JS-59 and JS-60

   Insert new pages JS-59 and JS-60 attached to this Addendum No. 3. A new special provision has been added for gas work.

C. Distribution of Quantities

1. Index Pages

   Delete pages Index 1 through Index 3 in their entirety and replace them with revised pages Index 1 (R-1) through Index 3(R-1) attached to this Addendum No. 3. Items with changes are indicated in bold type.

2. Page 13

   Delete page 13 in its entirety and replace it with revised page 13(R-1) attached to this Addendum No. 3. Item No. 65 has been deleted.

3. Pages 26 and 27

   Delete page 26 in its entirety and replace it with revised page 26(R-1), and insert new page 27, both of which are attached to this Addendum No. 3. Item Nos. 116 thru 118 have been added.

D. Drawings/Plans - Change/Addition

1. Sheet No. 4 - Bridge General Notes - 2

   Revise Sheet No. 4 as shown on Sketch No. 1(R-1) attached to this Addendum No. 3. Structural Steel Note No. 13 has been added.

2. Sheet No. 8 - Sequence of Construction

   Revise Sheet No. 8 as shown on Sketch No. 2(R-1) attached to this Addendum No. 3. The Diaphragm Detail has been revised.

3. Sheet No. 15 - Existing Framing Plan

   Delete Sheet No. 15 in its entirety and replace it with revised Sheet No. 15(R-1) attached to this Addendum No. 3. Notes and details related to gas main construction have been added and revised.

4. Sheet No. 24 - Miscellaneous Details - 2

   Delete Sheet No. 24 in its entirety and replace it with revised Sheet No. 24(R-1) attached to this Addendum No. 3. The gas detail at backwall has been revised and a gas installation plan has been added.

5. Sheet No. 25 - Demolition Details

   Revise Sheet No. 25 as shown on Sketch No. 3(R-1) attached to this Addendum No. 3. Demolition Note No. 5 has been added.

RI Department of Transportation

Manager, Division of Project Management

ATTACHMENTS

The applicable utility/municipality representatives are as follows:

Utility/Municipality	Contact	Phone Number
AT&T	Mark P. Burkhart	203-266-4372
Cox Communications	David Velilla	401-615-1284
Verizon	Peter DeCosta	508-884-4950
National Grid – Electric	Thomas Capobianco	401-784-7248
National Grid – Gas	Thomas Capobianco	401-784-7248
Kent County Water Authority	Timothy Brown, P.E.	401-821-9300
Warwick DPW	David Picozzi	401-738-2000 x6500
Warwick Fire Department	Jeffrey S. McGuire	401-468-4008
RIDOT Maintenance	Richard Talbot	401-734-4809

The following utility involvement is anticipated.

Utility	Utility Working Time
National Grid - Gas	Tie in new gas and activate (2 weeks)

1. SPECIALTY ITEMS

The following items are hereby designated “Specialty Items":

a. Traffic Signal Items
b. Traffic Signing (Excluding Temporary Construction Signs)
c. Pavement Markings
d. Sodding Lawn Sod
e. Installation of Facilities for NGrid Gas

2. SEQUENCE OF CONSTRUCTION

The Contractor shall develop an orderly sequence of construction and time schedule for all work to be performed under this contract in accordance with Section 108.03 of the RI Standard Specifications for Road and Bridge Construction. Any deviations from the requirements stated here or detailed in the plans, as well as any deviations from the approved construction work sequence and time schedule, must be submitted to the Engineer in writing for approval.

The Contractor shall perform the work during the day and/or night as specified in the plans and specifications, and in accordance with the Traffic-Related Work Restrictions indicated the Transportation Management Plan (TMP).

The Contractor shall sequence the work in a manner that utilizes the work zones, right of way, and traffic lane configurations established in the Contract Documents and TMP; and which minimizes impacts and inconveniences to vehicular traffic. Due to the limited available area, multiple traffic persons and flagpersons may be required to periodically stop

APPENDIX B

NATIONAL GRID GAS DOCUMENTS

GAS UTILITY GENERAL NOTES

1. CONTRACTOR SHALL FOLLOW THE GUIDELINES LISTED IN NATIONAL GRID'S "GUIDELINES FOR WORKING AROUND GAS UTILITIES", DOCUMENT ATTACHED.

2. DEPTH OF GAS FACILITIES ARE UNKNOWN AND COULD BE SHALLOW, USE CAUTION WHEN WORKING IN THE VICINITY OF ANY GAS FACILITY, HAND DIGGING ONLY.

3. NATIONAL GRID REQUIRES A MINIMUM OF ONE FOOT OF SEPARATION BETWEEN CROSSING UTILITIES AND EXISTING GAS FACILITIES.

4. NATIONAL GRID REQUIRES A MINIMUM OF THREE FEET OF SEPARATION BETWEEN THE GAS MAIN AND THE PARALLEL FACILITY FOR STEEL AND PLASTIC GAS MAINS.

5. IF A **GAS MAIN IS** EXPOSED OR **GOING TO BE EXPOSED** CALL NATIONAL GRID DAMAGE PREVENTION DEPARTMENT FOR AN INSPECTOR TO BE DISPATCHED TO SITE. CALL DAVID SOLTYS 401-623-0579 OR RICK LEPAGE 508-948-8432.

6. IF A **GAS MAIN OR GAS MAIN COATING IS** DAMAGED CALL NATIONAL DISPATCH OFFICE AT 877-304-1203 FOR AN INSPECTOR TO BE DISPATCHED TO THE SITE FOR REPAIR BEFORE BACKFILL.

7. FOR ANY EXPOSED GAS FACILITY, PROVIDE BACKFILL MATERIALS AND COMPACT THE BACKFILL MATERIALS IN ACCORDANCE WITH NATIONAL GRID'S "GUIDELINES FOR BACKFILL AND COMPACTION AROUND GAS PIPES", DOCUMENT ATTACHED.

8. WHEN CROSSING OR EXPOSING A STEEL OR PLASTIC GAS FACILITY SUPPORT MAY BE REQUIRED. FOLLOW THE GUIDELINES LISTED AND ILLUSTRATED IN NATIONAL GRID'S "SUPPORT REQUIREMENTS FOR EXPOSED & UNDERMINED STEEL OR PLASTIC GAS FACILITIES", DOCUMENT (DWG NO. CNST-6045) ATTACHED.

9. ALL GAS VALVE BOXES SHALL BE ADJUSTED TO THE NEW ROAD/SIDEWALK SURFACE. VALVE BOXES, IF REQUIRED FOR REPLACEMENT, CAN BE OBTAINED AT NATIONAL GRID'S PROVIDENCE LOCATION, 477 DEXTER STREET, PROVIDENCE, RI OR LINCOLN LOCATION, 642 GEORGE WASHINGTON HIGHWAY (QUANTITIES 5 OR LESS). GAS VALVE BOXES NEED TO BE ACCESSIBLE AT ALL TIMES TO BE OPERATED BY NATIONAL GRID IN THE EVENT OF AN EMERGENCY.

10. ALL CATHODIC PROTECTION BOXES (BOXES THAT CONTAIN WIRES THAT GO DOWN TO THE GAS MAIN) SHALL BE ADJUSTED TO THE NEW ROAD/SIDEWALK SURFACE. CARE SHALL BE EXERCISED WHEN ADJUSTING SO AS NOT TO DAMAGE THE WIRES. IF THE WIRES ARE DAMAGED OR IF ASSISTANCE IS NEEDED, CONTACT NATIONAL GRID CORROSION ENGINEER TO VISIT THE SITE. CONTACT ASAD AKINFOLARIN AT 401-215-5678 OR RON VINCENT AT 617-438-5192. NEW BOXES, IF REQUIRED, CAN BE OBTAINED AT NATIONAL GRID'S PROVIDENCE FACILITY, 477 DEXTER ST, PROVIDENCE, RI OR NATIOANL GRID'S LINCOLN FACILITY, 642 GEORGE WASHINGTON HIGHWAY, LINCOLN, RI (QUANTITIES 5 OR LESS). CONTRACTOR SHALL FOLLOW THE GUIDELINES LISTED IN NATIONAL GRID'S "GUIDELINES FOR WORKING AROUND CORROSION CONTROL SYSTEM COMPONENTS", DOCUMENT ATTACHED.

11. DUE TO SYSTEM RELIABILITY AND PUBLIC SAFETY CONCERNS, IT IS NATIONAL GRID'S PRACTICE TO RESTRICT ALL CONSTRUCTION WORK ON OR NEAR GAS FACILITIES BETWEEN NOVEMBER 15TH AND APRIL 15TH. ALL SCHEDULED WORK SHOULD BE COMPLETED BETWEEN APRIL 15TH AND NOVEMBER 15TH. AS GAS USAGE PEAK DURING THE MONTHS OF DECEMBER TO MARCH DRIVEN BY HEATING NEEDS, NATIONAL GRID'S PRIORITY IS TO PROVIDE OUR CUSTOMERS WITH SAFE AND RELIABLE GAS SERVICE. ANY WORK ON OR NEAR THE GAS FACILITY WILL EXPOSE OUR CUSTOMERS TO UNNECESSARY RISK. EXCEPTIONS WILL BE CONSIDERED ON A CASE BY CASE BASIS. APPROVALS FROM GAS CONTROL, OPERATIONAL ENGINEERING, AND PROJECT ENGINEERING WILL BE REQUIRED FOR THESE CASES.

12. FOR A GAS LEAK CALL 800-640-1595.

13. FOR A DAMAGED GAS FACILITY CALL 800-870-1664.

14. NATIONAL GRID WILL PURGE OUR OLD GAS MAIN OF GAS, WIPE TEST SAMPLE THE INSIDE OF THE PIPE, CAP THE ENDS AND ABANDON IN PLACE. PIPE FOUR INCHES AND LESS IN DIAMETER CAN'T BE SAMPLED; THIS PIPE WILL BE ASSUMED TO BE CONTAMINATED. IF THE WIPE TEST RESULTS SHOW PCB CONTAMINATION AND A SECTION OR SECTIONS NEED TO BE REMOVED BY THE CONTRACTOR THEN THERE ARE TWO POSSIBILITIES: IF THE QUANTITY TO BE REMOVED IS SMALL THE CONTRACTOR COULD TRANSPORT THE REMOVED SECTIONS WITH SEALED ENDS TO EITHER OUR ALLENS AVE FACILITY AT 642 ALLENS AVE IN PROVIDENCE OR OUR DEXTER ST FACILITY AT 477 DEXTER ST IN PROVIDENCE AND PLACE THEM IN OUR RED OPEN TOP "PIPE TO BE CLEANED" CONTAINER ON SITE. NATIONAL GRID WOULD THEN HANDLE THE CLEANING AND PROPER DISPOSAL … OR … THE CONTRACTOR COULD HIRE CLEAN HARBORS TO DELIVER AN OPEN TOP CONTAINER TO THE SITE, PLACE THE REMOVED SECTION INTO THE DUMPSTER AND THEN ARRANGE TO HAVE CLEAN HARBORS PICK UP THE CONTAINER. THE CHARGES ASSOCIATED WITH DELIVERY, ONSITE RENTAL AND PICK UP OF THE DUMPSTER WOULD BE THE CONTRACTORS RESPONSIBILITY AND NATIONAL GRIDS RESPONSIBILITY WILL BE FOR THE CLEANING AND PROPER DISPOSAL. NATIONAL GRID ALSO REQUIRES THAT THE OPEN PIPE ENDS OF THE ABANDONED PIPE REMAINING IN THE GROUND BE CAPPED OR SEALED WITH EXPANDING FOAM.

15. THE ENGINEERING ANALYSIS TO PERFORM THIS REPLACEMENT AND ASSOCIATED ESTIMATES ARE VALID FOR 12 MONTHS FROM THE DATE IT WAS REVIEWED AND APPROVED. AFTER THE 12 MONTHS THIS PROJECT WILL NEED TO REVIEW AGAIN FOR APPROVAL BY NATIONAL GRID.

16. IN ORDER TO COMPLY WITH BUY AMERICA, ALL STEEL AND IRON PRODUCTS USED IN THIS PROJECT WILL BE SPECIALLY ORDERED/NON-STOCK ITEMS. THE UTILITY EXPECTS THAT THE LEAD TIME FOR SECURING SUCH MATERIALS WILL TYPICALLY BE 7 TO 14 WEEKS, BUT MAY BE LONGER. THE UTILITY WILL ORDER SUCH MATERIALS WITHIN 30 DAYS OF GETTING A SIGNED AGREEMENT. RIDOT ACKNOWLEDGES AND AGREES THAT THE UTILITY MAY REQUIRE ADDITIONAL TIME FOR MATERIAL PROCUREMENT IN THE EVENT OF ANY UNFORESEEN CHANGES IN THE DESIGN OR FIELD CONDITIONS THAT RESULT IN ADDITIONAL BUY AMERICA MATERIALS BEING NEEDED FOR THE PROJECT. THE PARTIES ACKNOWLEDGE THAT THESE REQUIREMENTS MAY RESULT IN SIGNIFICANTLY LONGER-THAN-NORMAL CONSTRUCTION DURATIONS.

NATIONAL GRID APPROVED GAS PIPING CONTRACTORS IN RHODE ISLAND

Last Update 9/27/2017

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
InfraSource Construction, LLC	600 Clark Ave - Suite 3	King of Prussia	PA	19406	Stephen Sarmento	610-207-8661	stephen.sarmento@infrasourceinc.com	Plastic Installs ONLY

NATIONAL GRID

DOT REHABILITATION OF
CENTERVILLE ROAD BRIDGE NO. 425

MAIN INSTALLATIONS ACROSS BRIDGE

WARWICK

SECTION 100

JOB DESCRIPTION
AND
DESIGN SPECIFICS

February 6, 2018

101 **JOB DESCRIPTION**

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

101.11 Installation of (2) 12" steel casing pipes or "sleeves" through the bridge backwall sections and below the approach slabs, 4'-0" total (2'-0" each).

101.2 Work within this project by the state appointed gas contractor consists of:

101.21 Installation of approximately 150 feet of 8" steel pipe across the bridge and within the steel sleeves in the backwalls including: Pipe supports, link seals, casing spacers, casing end seals, and 45 degree elbows to anchor the pipe in the ground and bring pipe to match the depth of the existing gas main.

101.22 Installation of approximately 200 feet of 8" plastic street main including plastic valves, plastic tees, and plastic elbows to bring the pipe in alignment with the existing gas main end at each bridge end.

101.23 Fabrication of (2) tie-in sections each consisting of (1) 8"x 45 plastic elbow and (2) 3' pieces of 8" plastic pipe.

101.24 Fabrication of (1) tie-in sections each consisting of (1) 8"x6" plastic reducer and (1) 3' piece of 8" and 3' piece of 6" plastic pipe.

101.25 Pressure testing the main installed for the bridge to 150 psig for a minimum of 1 hour in accordance with Section 106 and installation of cathodic protection consisting of (5) two wire test stations each with (4) 17# anodes (Doc 030026-CS).

101.26 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 **Twelve-Inch Steel Pipe: (Sleeves Through the Backwalls – 2 Required)**

103.11 Length Required: Approximately 2'-0" each @ 2 = 4'-0" total

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: Pritec 10/40

103.2 **Eight-Inch Steel Pipe (Pipe Across Bridge):**

103.21 Length Required: Approximately 150 feet total

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

103.23 Wall Thickness – std wall(t): 0.322"

103.24 Longitudinal Joint Factor (E): 1.0

103.25 Minimum Specific Yield Strength (S); 35,000 psi

103.26 Design Hoop Stress @ psig =

$$\frac{(100)(P)(D)}{2(t)(E)(S)} = \frac{(100)(100)(8.625)}{(2)(0.322)(1.0)(35{,}000)} = 3.82\% \text{ of SMYS}$$

103.27 Pipe Coating: Pritec 15/50

103.3 **Eight-Inch Plastic Pipe: (Street Main for Bridge)**

103.31 Length Required: Approximately 200 feet

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

103.33 Wall Thickness (t): 0.784" (DR 11.0)

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

103.35 Maximum Operating Pressure $\frac{(2xSxtx0.32)}{(D-t)} = \frac{(2x1600x0.784x0.32)}{(8.625-0.784)} =$ 102 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 (3) 8"

104.3 **Weld Fittings:**

104.31 Elbow: (4) 8"x 45 degree
104.32 Reducer: None
104.33 Nipple: (2) 2"x 6"long TOE Extra Heavy
104.34 Transition Fitting: (2) 8"
104.35 Equalization Fitting: (5) 2"
104.36 TDW Shortstop Fitting: (3) 8"; (2) 6"

104.4 **Plastic Fittings**

104.41 Cap: (3) 8"
104.42 Tapping Tee: (2) 8"x 2"

104.43 Reducer: (1) 6"x 8"
104.44 Elbow: (4) 8"x 45 degree
104.45 Tee: (1) 8"
104.46 Transition Fitting: See Weld Fittings

104.5 **Other:**

104.51 (3) 8" Canusa Shrink Sleeves for above ground use
(6) 8" GlasMesh FRP Casing Insulators Type 220/240
(6) 8" LB&A Roller Support with Hold Down Strap
(2) 8"x 12" Casing End Seals
(4) 8"x 12" Link Seal
(4) 8"x 12" Casing Spacer
(10) Street Valve Box
(2) 2" Pre-Fab Riser
(2) 2" Meter Cock
(20) 17# Anodes
250' of 12 Gauge Black Wire
250' of 12 Gauge White Wire
250' of No. 12 Tracing Wire
250' of 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 mains on the bridge shall be in accordance with the RIDOT project plans.

105.4 All required cathodic protection shall be in accordance with National Grid Installation of Test Stations for Cathodic Protection 030026-CS – Two Wire Test Station.

105.5 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.

105.6 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 all piping to a pressure of 150 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/D ratios 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 prodecure 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 gascopes are required for each test when purging. Continuous sampling with two (2) gascopes 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) gascopes, 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) gascopes, 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 preceed 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) gascopes, 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.

211A 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.

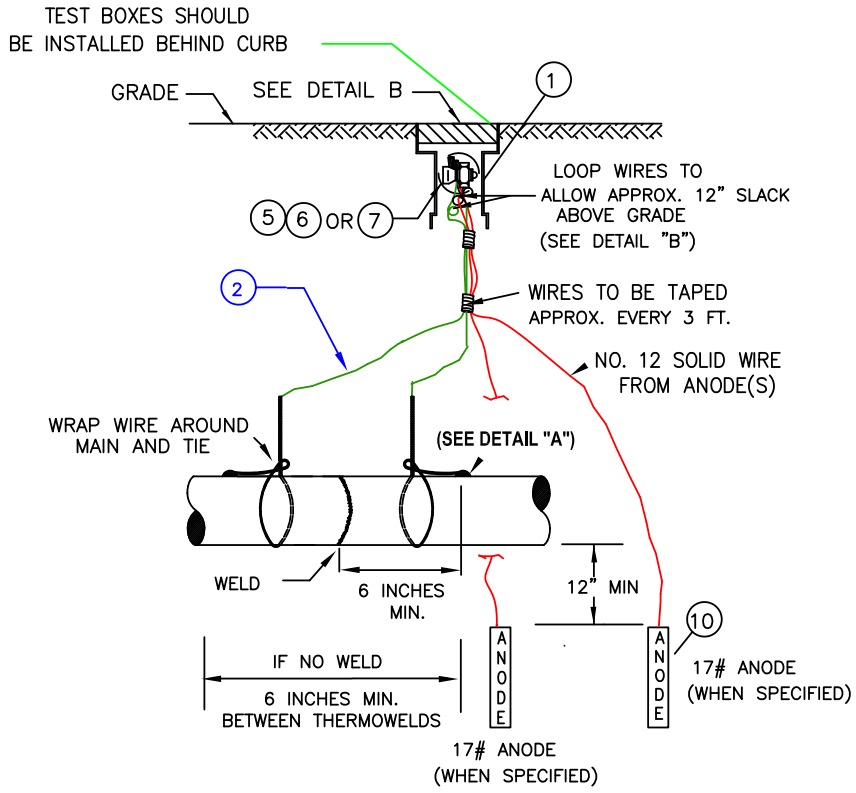
212.02A Care must be exercised when backfilling to insure that no sharp objects or rocks will be in contact with the pipe. Mechanical tamping shall not be used until 12 inches of cover has been placed over the pipe.

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.

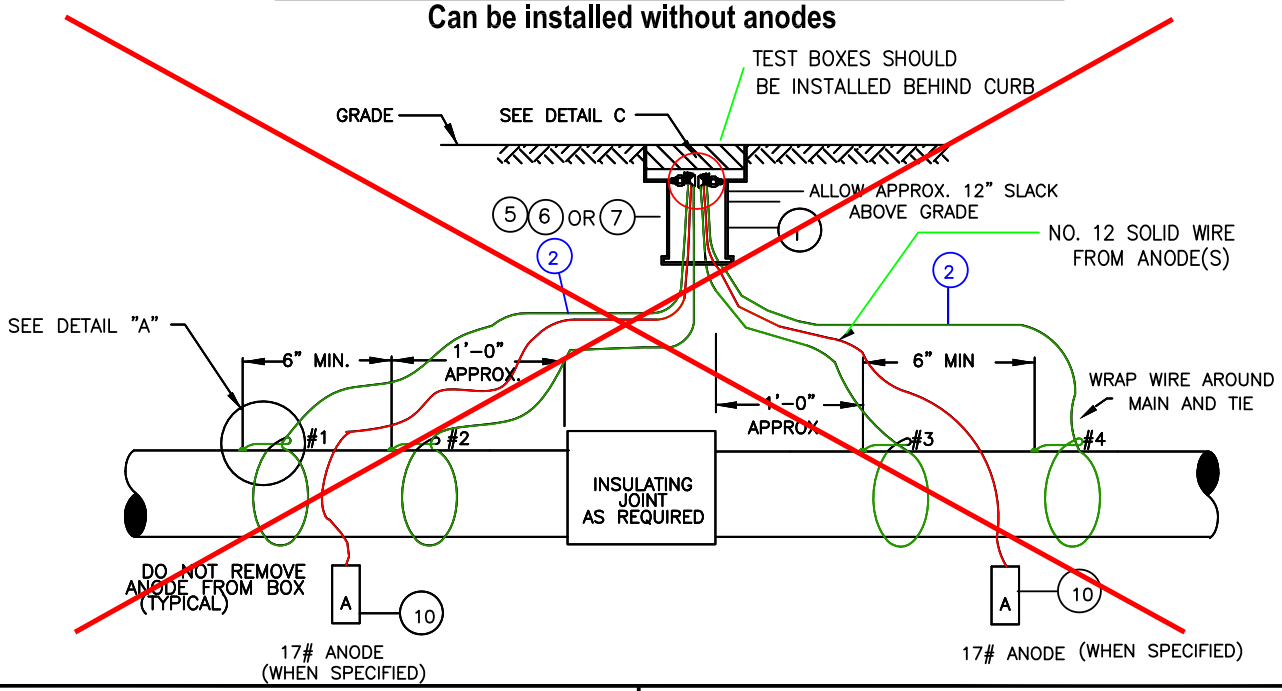
TWO WIRE TEST STATION WITH ANODE(S)

Can be installed without anodes



FOUR WIRE TEST STATION WITH ANODES

Can be installed without anodes



nationalgrid

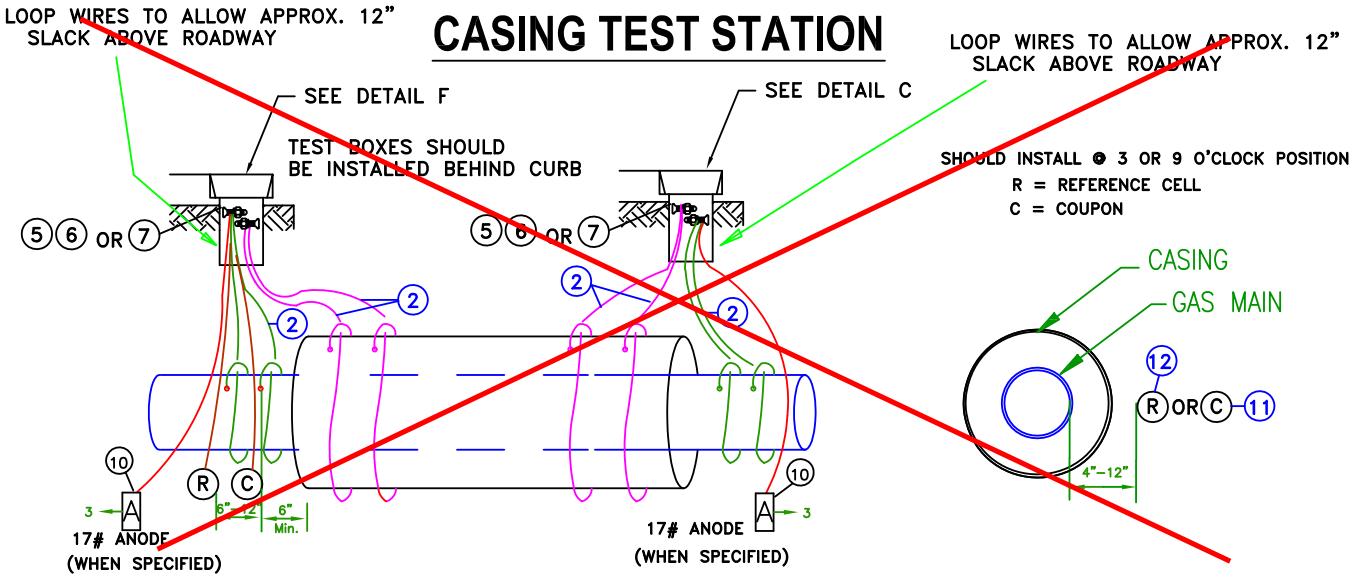
ALL REGIONS

INSTALLATION OF TEST STATIONS FOR CATHODIC PROTECTION

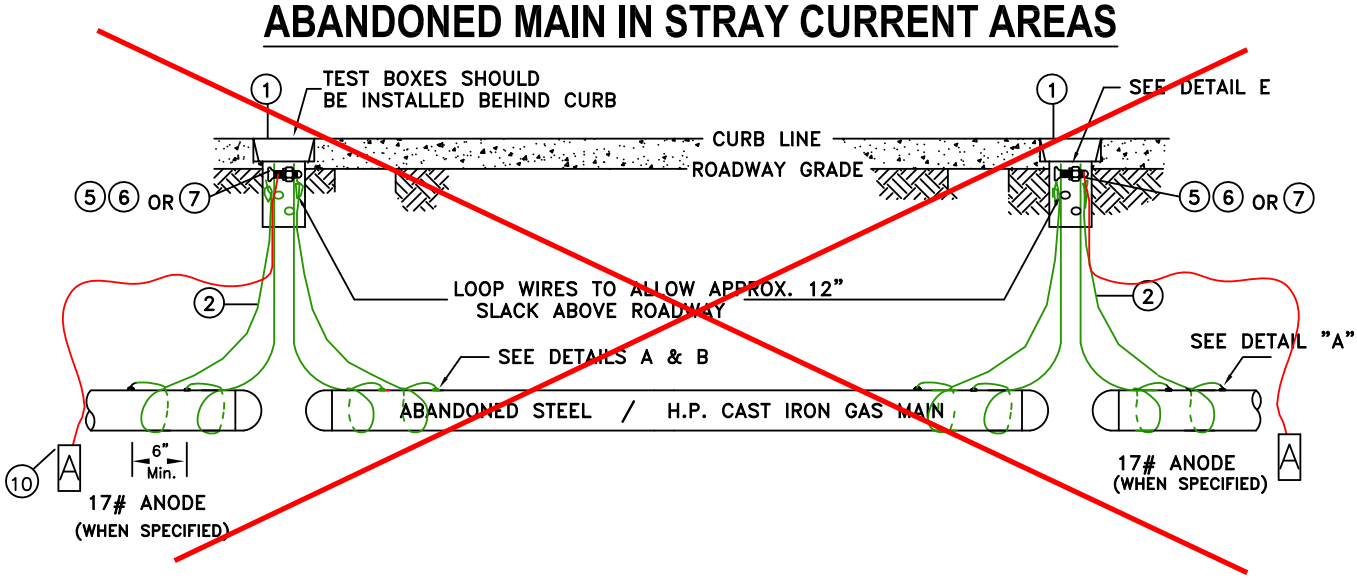
REVISIONS: REVISED USING SAP ITEM ID'S

DATE: 07/15/2010	EFFECTIVE DATE: 09/15/2013
DESIGN: PG	STD. DWG. NO. 030026-CS
APPROVED: PS	

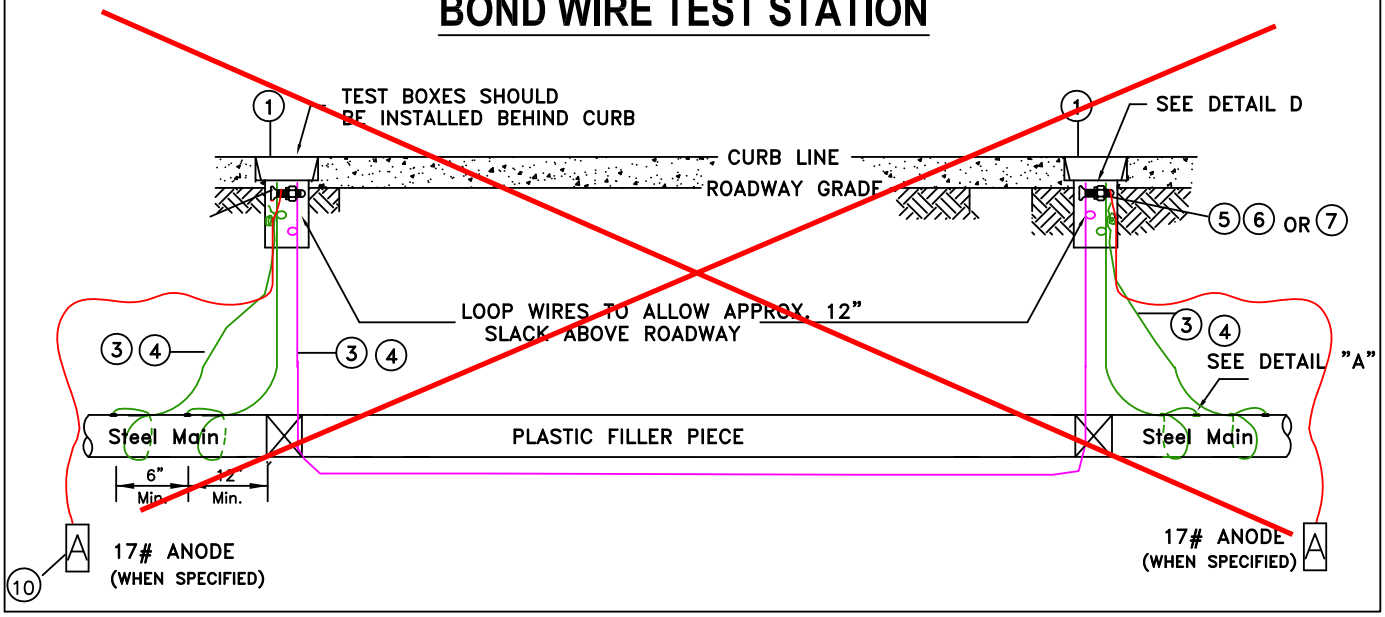
CASING TEST STATION



ABANDONED MAIN IN STRAY CURRENT AREAS

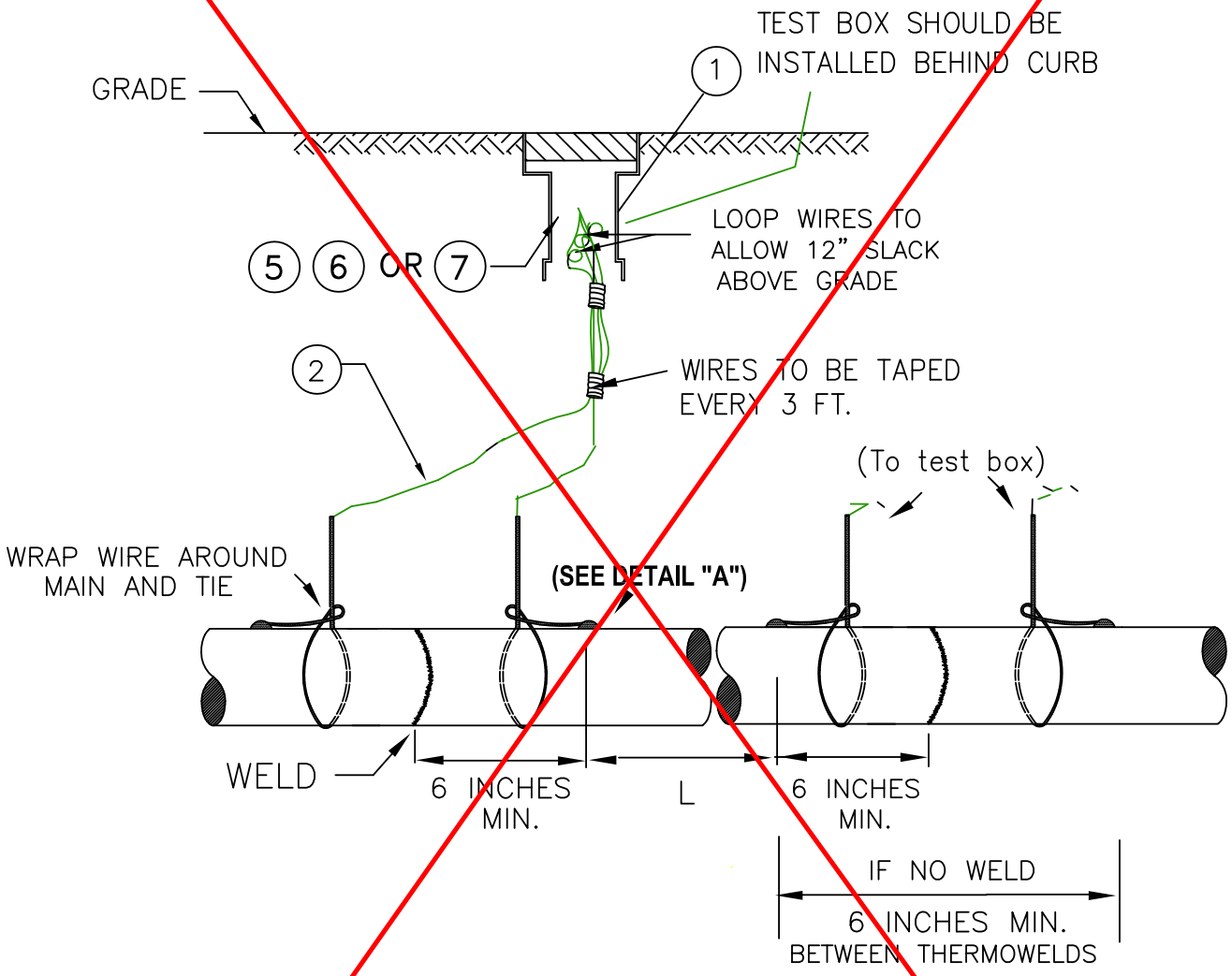


BOND WIRE TEST STATION



SHT. 2 OF 5 030026-CS

CURRENT DROP MEASURING TEST STATION

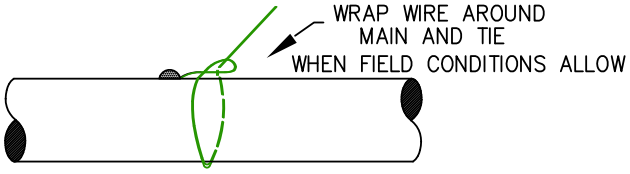


CURRENT DROP MEASURING TEST STATION SPACING

PIPE DIAMETER	"L"
3/4" – 4"	75'
6" – 10"	100'
12" AND OVER	125'

SHT. 3 OF 5 030026-CS

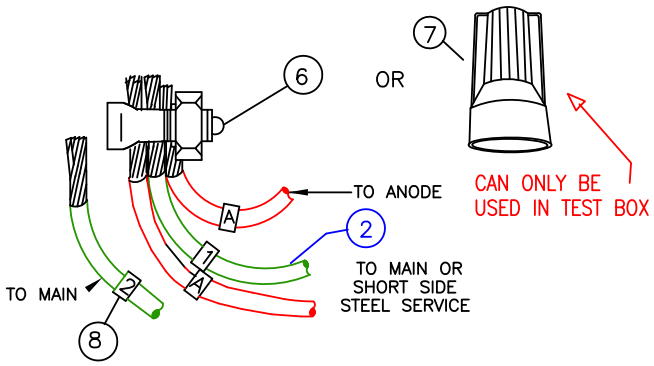
ATTACH WIRE IN ACCORDANCE
WITH APPROVED THERMOWELD PROCEDURE



DETAIL "A"

Two wire test station

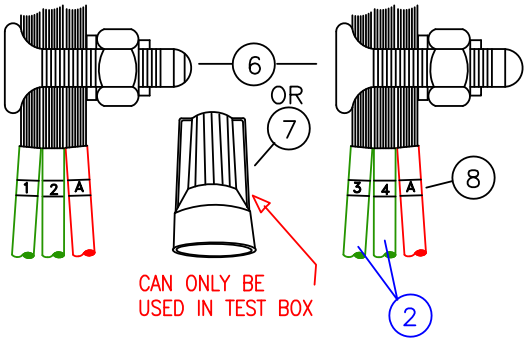
Shown with 2 anodes



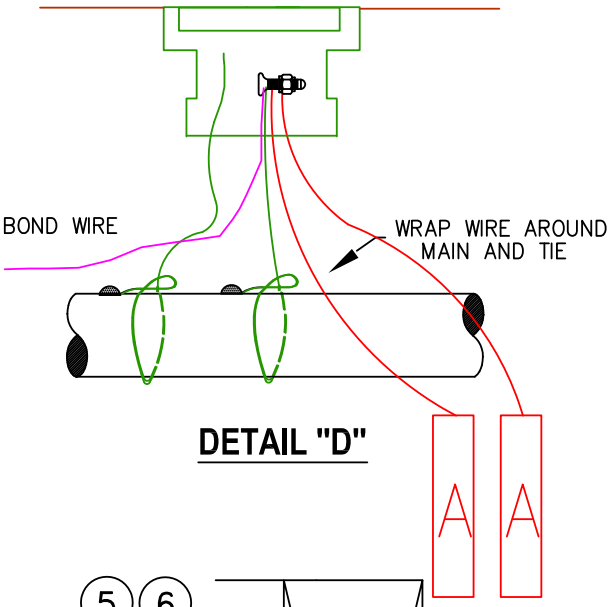
DETAIL "B"

Four wire test station

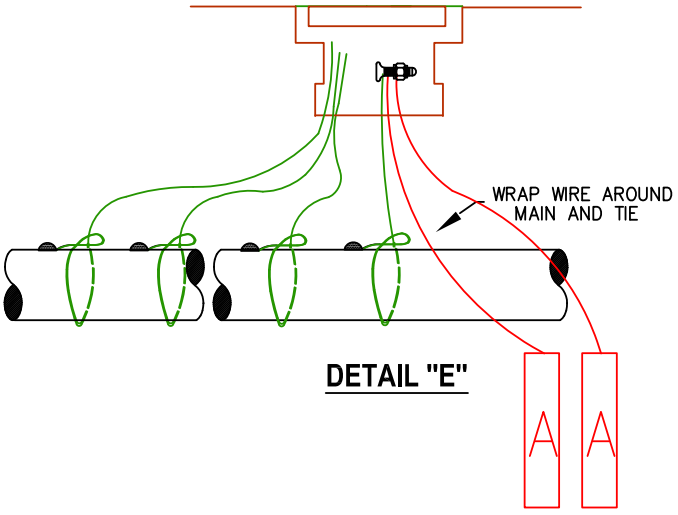
CONNECT ALL WIRES AS NEEDED



DETAIL "C" (typ)



DETAIL "D"



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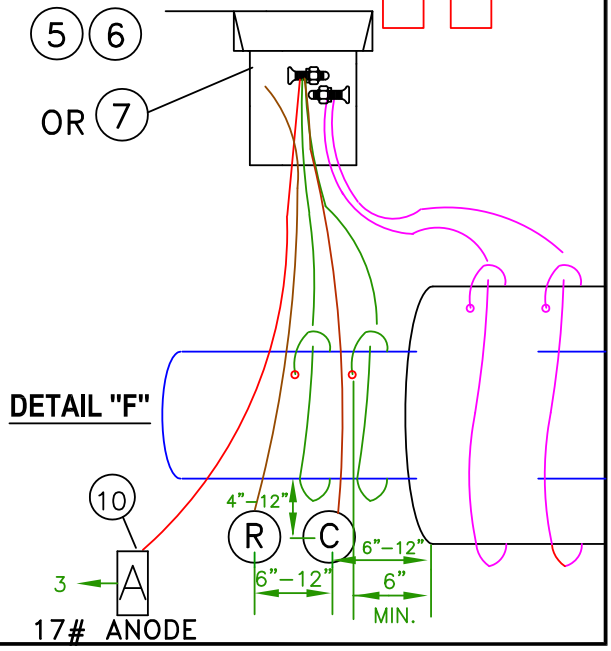


DETAIL "F"

SHT. 4 OF 5 030026-CS

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 7 CONNECTOR, SPLIT BOLT, TYPE 1/01 CONNECTOR, TWIST-ON WIRE NUT	9331578 9331641 9331612 9330683	9316630 9331641 - 9314631	9331578 9331641 9331612 9330683	NON STOCK 9331641 - 9314631	USE WITH NO. 6 CABLE 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

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.

GUIDELINES FOR WORKING AROUND CORROSION CONTROL SYSTEM COMPONENTS

DESCRIPTION

This guideline shall control work around existing Corrosion Control components. Replacement of test stations, anodes and test wire leads shall comply with Standards and Specifications stipulated by Nationalgrid. If design plans call for work in the area of Corrosion Control components, care must be taken to prevent damage to such components.

GENERAL NATIONALGRID CONSIDERATIONS

The contractor shall perform replacement of damaged corrosion control test boxes, resetting of disturbed test boxes, and ensure a minimum of 12” of excess wire above the rim of the test box after set to finished grade. Wires shall not be pulled taught to achieve the 12” above the box, as this will cause stress on the wire connection at the main. Wires needing to be lengthened, damaged corrosion control components i.e. wires, or wire coating, shall require notification to the Corrosion Control Department (525-5610 or 474-5171) to initiate inspection/repair or replacement of the damaged components.

Backfilling exposed Corrosion Control wire components should begin immediately after the work in that location is complete. The region within 6" alongside and on top of the connector wires shall be backfilled with padding sand (free of cinders, ash, and rock). Test wire leads must be kept with enough slack to prevent stress on the points where the wires connect to the gas main. 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 8” to 12” backfill layers shall be mechanically compacted to the industry standard of 95%.

nationalgrid

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

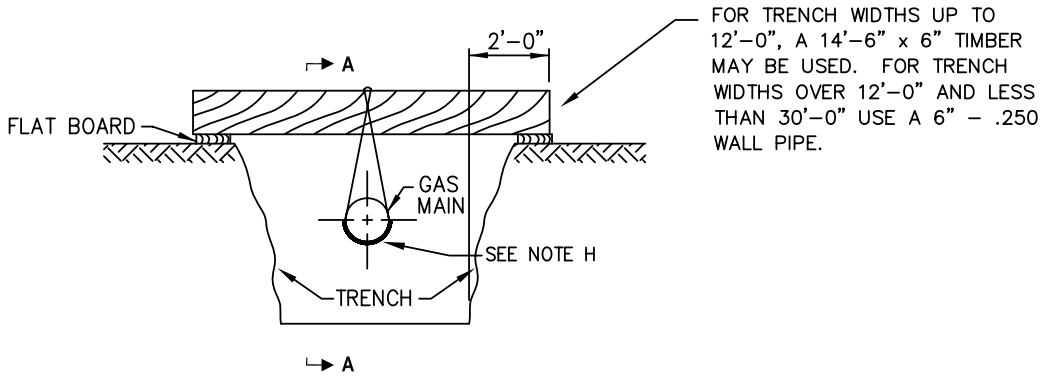
If any gas mains or services become exposed, National Grid must be notified to inspect the line before backfilling. Also any damage that may have been made to the pipe or pipe coating will need to be repaired by National Grid before backfilling. Contact our Dispatch office at (877) 304-1203 for inspection. 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.

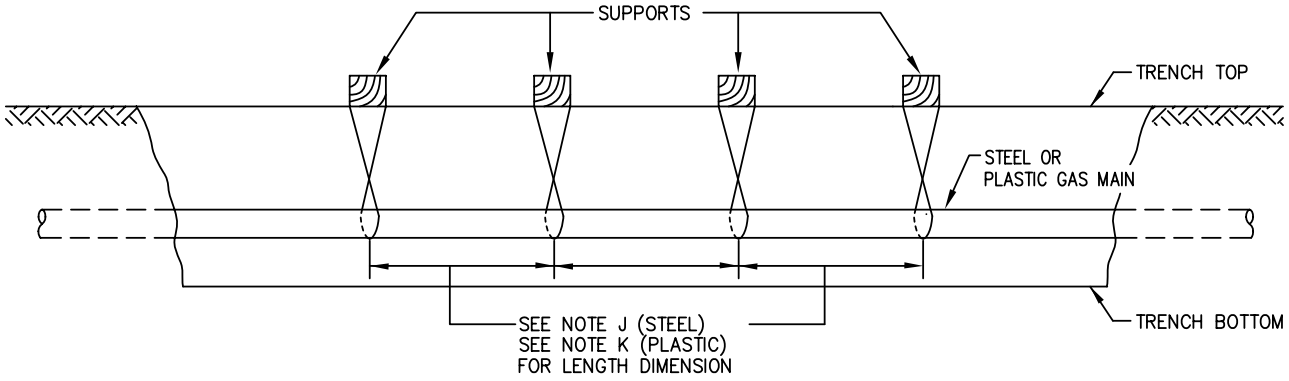
Blasting
National Grid must be notified of any blasting that will take place within 200 feet of a gas utility. National Grid must be supplied with a detailed blast plan for blasting in the vicinity of gas facilities. The evaluation of the blast plan by a National Grid engineer may take some time, therefore, 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.

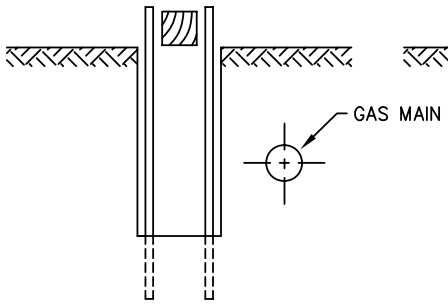
Clearance
Adequate clearance must be provided when installing other utilities, foundations, structures, etc. Contact National Grid engineer for guidance.



EXPOSED SUPPORT



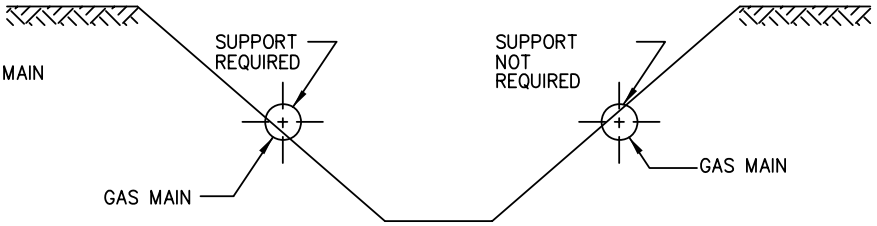
SUPPORTED LENGTH A-A



ADEQUATELY SHORED TRENCH

DETAIL A

SEE NOTE B



INADEQUATELY SHORED OR UNSHORED TRENCH

DETAIL B

SEE NOTE B

nationalgrid LI–MA–NH–NYC	**SUPPORT REQUIREMENTS FOR EXPOSED & UNDERMINED STEEL OR PLASTIC GAS FACILITIES**	
REVISIONS CLARIFIED NOTES B & C ADDED NOTE N.	DATE: 07/01/2003 DESIGN: A. GIULIANI DRAWN: P. DIMAIO	EFFECTIVE DATE: 03/24/2006 STD. DWG. NO. **CNST-6045**

SHT. 1 OF 2

NOTES:

A. THIS CONSTRUCTION STANDARD SHALL BE USED TO SUPPORT PLASTIC OR STEEL GAS FACILITIES WHICH ARE UNDERMINED AND EXPOSED BY CONSTRUCTION ACTIVITY.

B. IF AN EXCAVATION IS MADE AT ANY DISTANCE PARALLEL TO THE GAS FACILITY WITH ADEQUATE OSHA STRUCTURAL SHORING, AS SHOWN IN DETAIL "A", OR IF A STABLE SOIL CONDITION WITH SUFFICIENT COVER ABOVE THE PIPE'S CENTERLINE EXISTS, AS SHOWN IN DETAIL "B", THEN SUPPORTS ARE NOT REQUIRED. UNSTABLE SOIL IS DEFINED AS A SOIL WHICH CAN CAUSE "SOIL RUN OUT" FROM BENEATH THE PIPE (e.g., WASHOUT, SOFT CLAY, etc.,) OR CAN SHIFT DUE TO CONSTRUCTION ACTIVITY, VIBRATIONS, etc.; AND CAUSE A SOIL SCENARIO TO OCCUR AS SHOWN IN DETAIL "B" TO REQUIRE PIPE SUPPORT.

C. IF AN EXCAVATION CROSSES OR RUNS PARALLEL TO A GAS FACILITY, SUPPORTS MAY NOT BE REQUIRED IF THE EXPOSED SECTION OF PLASTIC PIPES IS 3' OR LESS AND STEEL PIPES 7' OR LESS.

D. ALL EXCAVATIONS SHALL BE PERFORMED IN ACCORDANCE WITH THE REQUIREMENTS OF THE ONE CALL DIG SAFE PROGRAM USING THE APPROPRIATE MARK OUT, TEST HOLES AND EXCAVATION TO AVOID DAMAGE TO PIPE OR PIPE COATINGS:
- NEW YORK STATE CODE RULE 753
- MA CHAPTER 82 - SECTION 40, GENERAL LAWS, REGULATING NOTICE REQUIREMENTS FOR EXCAVATION IN PUBLIC WAYS
- NH DIG SAFE LAW, RSA 374 – REGULATING UNDERGROUND UTILITY DAMAGE PREVENTION SYSTEM

E. USE OF THIS CONSTRUCTION STANDARD DOES NOT RELIEVE THE CONSTRUCTION AGENCY OR AUTHORITY OR THEIR RESPECTIVE CONTRACTORS OF RESPONSIBILITY FOR DAMAGES. ALL DAMAGES WILL BE REPAIRED IN ACCORDANCE WITH EXISTING STANDARDS AND THE APPROPRIATE PARTY SHALL BE BILLED FOR ALL EXPENSES.

F. GAS FACILITIES SHOULD NOT BE UNDERMINED WITHOUT ADEQUATE SUPPORT (DETAIL A). ALL SUPPORT LINES SHALL BE TENSIONED SO THAT NO DEFLECTION WILL OCCUR WHEN THE FACILITY IS UNDERMINED. THIS TENSION SHALL BE CHECKED AT THE START AND END OF EACH DAY AND ADJUSTED AS NECESSARY.

G. WHERE A COUPLING, GAS SERVICE, CLAMP, VALVE, DRIP LINE OR OTHER APPURTENANCE EXISTS ON THE EXPOSED SECTION OF MAIN, AN ADDITIONAL SUPPORT SHALL BE INSTALLED AT THE LOCATION.

H. WHEN SUPPORTING AN EXPOSED FACILITY, THE PIPE COATING SHALL BE PROTECTED WITH ROCK SHIELD (ITEM ID 00301097), OR OTHER LIKE MATERIAL CUT TO A MINIMUM WIDTH OF ½ THE SUPPORTED PIPE DIAMETER. SUPPORT LINES SHALL BE A MINIMUM OF ¾" POLYPROPYLENE OR BETTER.

I. SUPPORTS FOR GAS TRANSMISSION FACILITIES SHALL BE REVIEWED WITH GAS ENGINEERING PRIOR TO INSTALLATION.

J. THE MAXIMUM SPACING BETWEEN SUPPORTS FOR STEEL FACILITIES SHALL BE AS FOLLOWS:
7' SPACING FOR ¾" AND 1 ¼" STEEL
10' SPACING FOR 2" STEEL
15' SPACING FOR 3" AND 4" STEEL
20' SPACING FOR 6" AND LARGER STEEL

K. THE MAXIMUM SPACING BETWEEN SUPPORTS FOR PLASTIC FACILITIES SHALL BE AS FOLLOWS :
3 ' SPACING FOR 2" AND SMALLER PLASTIC
6' SPACING FOR 4" AND LARGER PLASTIC

L. VIBRATING MACHINES ARE ALLOWED OVER STEEL OR PLASTIC FACILITIES WITH 24" OR GREATER COVER. HAND HELD MECHANICAL. TAMPER IS ACCEPTABLE OVER ANY FACILITY WITH 12" OR GREATER COVER.

M. WHEN CONSTRUCTION ACTIVITY IS COMPLETED, CLEAN FILL SHALL BE COMPACTED AROUND AND UNDER THE GAS FACILITY BEFORE REMOVING SUPPORTS.

N. SEE REGIONAL PBWK5010 PROCEDURES FOR **REPLACEMENT** REQUIREMENTS OF CAST IRON PIPE.

No.	**ITEM**	**CODE No.**

BILL OF MATERIAL

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.

STOP	The pipeline subjected to the pressure test shall be isolated from all other piping containing gas or combustible material. Closed valves are not 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.
	Attachment 1: 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

STOP	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

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.

Table 1: Minimum Pressure Test Durations for Plastic Pipelines (≤ 12-inch diameter) and Steel Pipelines Operating Below 20% of SMYS[1]

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
≥ 6,000	Consult Gas Systems Engineering for pressure test durations		

Note 1: The minimum required test pressures are as follows:

MAOP	Required Test Pressure
≤ 60 psig	90 psig
> 60 psig	1.5 times the MAOP

Table 2: Cast Iron and Steel Mains Reconditioned with Cured-in Place Liners

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

*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".

Test requirements for steel pipelines to operate at a hoop stress less than 30% of SMYS and at or above 100 psig:

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)

	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)).
	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: • 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

	Polyethylene **(**PE) and steel tie-in sections of pipe for mains shall be pressure tested. 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. 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)).

	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. 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)). 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. 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.” 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. 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.
	New York Only: 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)). 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.
	MA Only: Pretested Pipe Per Mass. DPU letter of Interpretation dated April 04, 2008: • 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.

Reducing Pressures in the Pipeline Following the Pressure Test

STOP	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.
	Once the area director provides approval, the requirements below shall be followed: • 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

	Each operator shall make a record of each test performed. The record shall contain at least the following information (49 CFR 192.517): • 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.

	• 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

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
- [ ] Welded
- [ ] Fused
- [ ] Coupled
- [ ] Cured-In-Place Lining

2. Type of Couplings
- [ ] Self-Restraining Compression
- [ ] Self-Restraining Hydraulic
- [ ] Electrofusion
- [ ] Non-Restraining Compression
- [ ] Other _____

3. Design MAOP Pressure
- [ ] LP
- [ ] HP - 15 PSIG
- [ ] HP - 60 PSIG
- [ ] Other: _____

4. Test Pressure
- [ ] 90 PSIG
- [ ] Other: _____

5. Test Medium
- [ ] Air
- [ ] Nitrogen
- [ ] Water

6. Test Duration
- [ ] 1 Hour
- [ ] 2 Hours
- [ ] 4 Hours
- [ ] 6 Hours
- [ ] Other: _____

7. Test Recorder
- [ ] Dial Gauge
- [ ] Recording Chart
- [ ] Recording Chart w/Dead Weight Tester
- [ ] Temperature Recording Chart

8. Pipe End Cap Blocking
- [ ] None Required
- [ ] Per CS-MAIN004
- [ ] Other – attach sketch

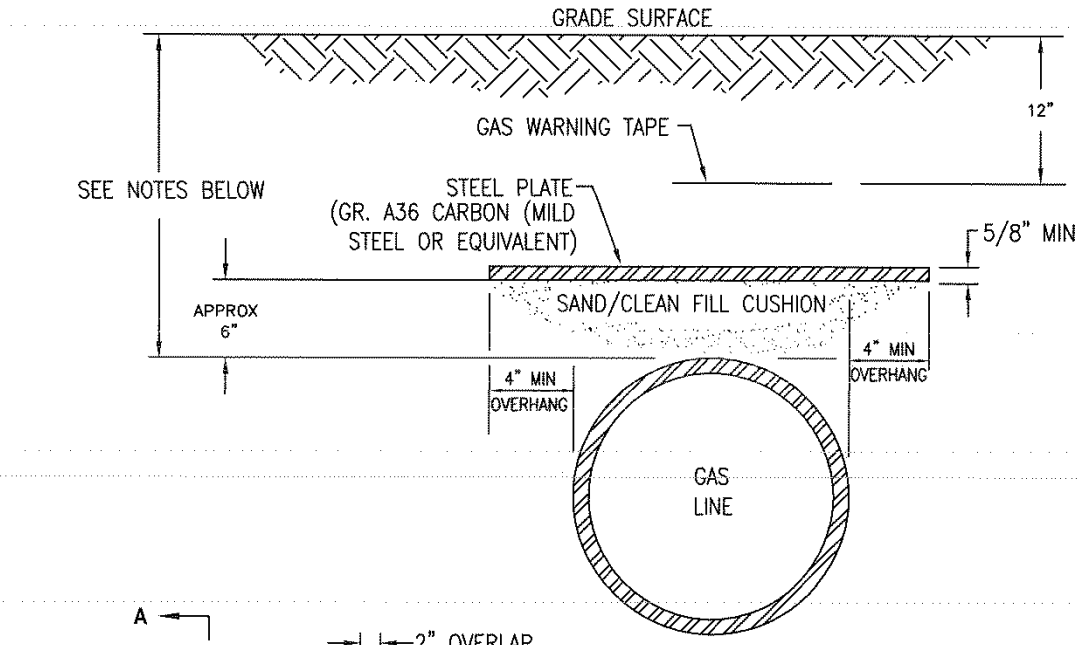
9. Strapping
- [ ] None
- [ ] Other: _____

10. Backfill
- [ ] Entire Run Except Ends
- [ ] Exposed/Inserted
- [ ] Other: _____

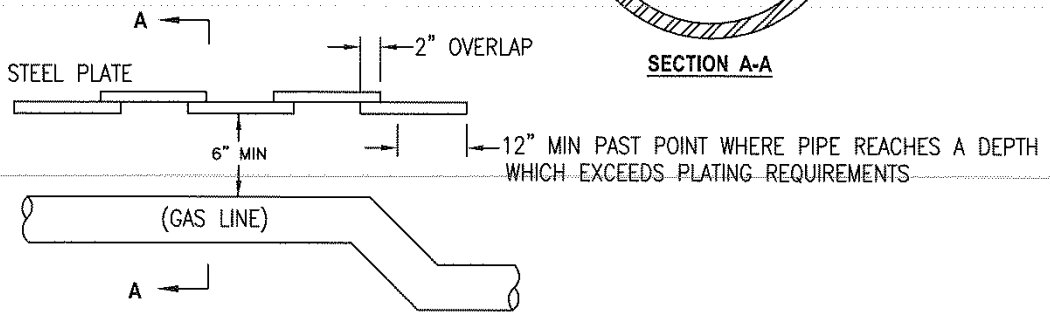
11. [ ] **Barricades**

12. [ ] **Warning Signs**

13. Soap Test
- [ ] All exposed fittings.
- [ ] Tie-in Connections & Couplings.



SECTION A-A



METHOD OF LAYING PLATES
ELEVATION

PROTECTIVE PLATES ARE REQUIRED:

1. FOR ANY GAS MAIN OR TRANSMISSION LINE OPERATING IN EXCESS OF 200 PSIG AND HAVING LESS THAN THREE FEET (3') OF COVER.
2. FOR ANY GAS MAINS OPERATING AT LESS THAN 200 PSIG HAVING LESS THAN TWO FEET (2') OF COVER.
3. FOR ANY SERVICE LOCATED IN THE PUBLIC RIGHT-OF-WAY HAVING LESS THAN EIGHTEEN INCHES (18") OF COVER.
4. FOR ANY SERVICE LOCATED IN PRIVATE PROPERTY HAVING LESS THAN TWELVE INCHES (12") OF COVER.

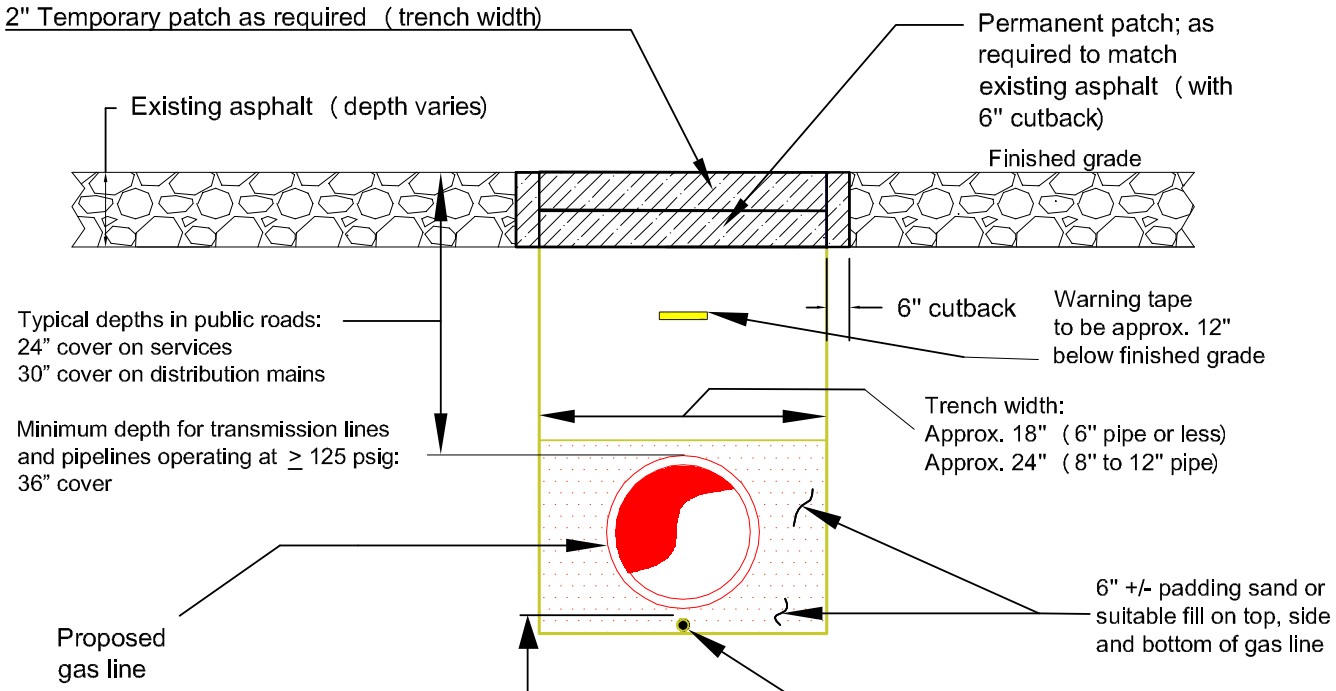
NOTES:

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 STD. DWG. No. CNST-6025 FOR TYPICAL 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	DATE: 02/07/2006	EFFECTIVE DATE: 02/07/2006
	DESIGN: W. FROMM	STD. DWG. NO. **CNST-6030**
	DRAWN: G. HURLEY / P.D.	

SHT. 1 OF 1

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	STD. DWG. NO. **CS-CNST002**
DRAWN: N. COSTANZO	

INDEX **(R-1)**
SPECIFICATIONS – JOB SPECIFIC

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 $ 427.50 per ton.

* In the case of modified asphalt binder, this price adjustment provision shall only apply to the neat liquid asphalt component. This provision shall not apply to the modifier component, manufacture, storage, transportation or other associated costs.

b. Diesel Fuel. The Base Price of Diesel Fuel as required to implement **Subsection 938.03.2** of the Standard Specifications is $ 2.2153 per gallon.

The Base Prices listed above were determined by RIDOT as being effective on February 1, 2018.

CODE 702.9910 INSTALL 8" POLYETHYLENE GAS MAIN AND FITTINGS ON APPROACHES

CODE 702.9911 INSTALL 8" STEEL GAS MAIN AND FITTINGS ON BRIDGE

DESCRIPTION. This work consists of installing polyethylene gas main on approaches and welded steel gas main on bridge as shown on the Plans, and in accordance with the National Grid Gas Documents included in Appendix B of the Contract Specific General Provisions, and these Special Provisions. The Contractor will be required to cooperate fully with the Gas Company, and shall give the Gas Company at least six (6) weeks advance notice as to when materials (being supplied by the Gas Company) will be needed and the actual installation work will be performed.

Existing Gas mains shall be removed by the Contractor under item 201.0414. Pipe will be tested for PCB contamination by National Grid Gas. If pipe is found to be contaminated then the Contractor shall cap the ends and dispose of pipe at 642 Allens Avenue, Providence, RI per National Grid direction. If pipe is not contaminated then Contractor shall legally dispose of pipe. All ends of pipe to remain shall be capped by Contractor. Capping ends of pipe shall conform to National Grid requirements at no extra cost.

Construction on or near gas facilities is restricted from November 15th to April 15th as described in the National Grid Gas Documents. Contractor must request and receive written approval from National Grid to perform any work within a distance of 7 feet from gas facilities within this time frame. No extra payment or time extension will be granted in connection with complying with this requirement, regardless of whether or not National Grid approves any such request.

MATERIALS.

Material provided by contractor includes padding sand and backfill for trenches. All other materials, including pipe hangers and sleeves through backwalls, will be provided by National Grid.

All materials shall conform to the National Grid Gas Documents.

CONSTRUCTION.

Installation of gas facilities shall be by a National Grid Approved Gas Piping Contractor, and shall conform to the requirements of National Grid Gas Documents.

Gas tie-ins will be by National Grid.

METHOD OF MEASUREMENT.

"Install 8" Polyethylene Gas Main and Fittings on Approaches" will be measured by the number of linear feet actually installed and accepted, measured along the centerline of the pipe.

“Install 8" Steel Gas Main and Fittings on Bridge” will be measured by the number of linear feet actually installed and accepted, measured along the centerline of the pipe.

BASIS OF PAYMENT:

The accepted quantity of “Install 8" Polyethylene Gas Main and Fittings on Approaches” will be paid for at the contract unit price per linear foot as listed in the Proposal. The price so-stated shall constitute full and complete compensation for all loading and hauling materials supplied by the Gas Company, furnishing all materials not supplied by the Gas Company, and for all equipment, tools and labor, including excavation, backfill and padding sand, as detailed on the plans and described in these Special Provisions, complete, in place, and accepted by the Gas Company and the Engineer.

The accepted quantity of “Install 8" Welded Steel Gas Main and Fittings on Bridge” will be paid for at the contract unit price per linear foot as listed in the Proposal. The price so-stated shall constitute full and complete compensation for loading and hauling materials supplied by the Gas Company, furnishing all materials not supplied by the Gas Company, and for all equipment, tools and labor, including, but not limited to, installing hangers on bridge and casing pipes thru backwalls, as detailed on the plans and described in these Special Provisions, complete, in place, and accepted by the Gas Company and the Engineer.

The above pay items shall include installation of all materials supplied by the gas company.

Table of Contents - Distribution of Quantities

Project Name - Centerville Road Bridge No. 425 Rehabilitation
Estimate Name - Addendum No. 3
R.I. Contract No. - 2017-CB-078
FAP Nos: BHO-0425(001)

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FAP Nos: BHO-0425(001)

Item No.	Item Code	Description	UM	Qty.	Pay Code	Seq. No.
061	**914.5010 Cont.**	STAGE 1 (4MTHS/30D/8HR) X2		1,920.00	0014	01
		STAGE 2 (3MTHS/30D/8HR) X2		1,440.00	0014	01
		STAGE 3 (4MTHS/30D/8HR) X2		1,920.00	0014	01
		Item 914.5010 Total:		**6,000.00**		
062	**914.5020**	**FLAGPERSONS - OVERTIME**	**MHRS**			
		PROJECT WIDE				
		FROM ITEM 914.5010 (~25%)		1,500.00	0014	01
		Item 914.5020 Total:		**1,500.00**		
063	**916.0600**	**SHOCK ABSORBING BARRIER MODULES**	**GRP**			
		CENTERVILLE ROAD				
		STAGE 1		2.00	0014	01
		ROUTE 2				
		NB		1.00	0014	01
		SB		1.00	0014	01
		Item 916.0600 Total:		**4.00**		
064	**916.0650**	**REMOVE, RELOCATE AND RESET SHOCK ABSORBING BARRIER MODULES**	**GRP**			
		CENTERVILLE ROAD				
		STAGE 1 TO STAGE 2		2.00	0014	01
		STAGE 2 TO STAGE 3		2.00	0014	01
		ROUTE 2				
		NB - LEFT TO RIGHT		1.00	0014	01
		SB - LEFT TO RIGHT		1.00	0014	01
		Item 916.0650 Total:		**6.00**		
065	**920.9901**	**FILTER FABRIC FOR CATCH BASIN INLET PROTECTION**	**SY**			
		CENTERVILLE ROAD				
		FROM ITEM 707.2000			0014	01
		Item 920.9901 Total:		****DELETED****		

Distribution of Quantities

Project Name - Centerville Road Bridge No. 425 Rehabilitation
Estimate Name - Addendum No. 3
R.I. Contract No. - 2017-CB-078
FAP Nos: BHO-0425(001)

Item No.	Item Code	Description	UM	Qty.	Pay Code	Seq. No.
S112	**T20.2014**	**4 INCH EPOXY RESIN PAVEMENT MARKINGS YELLOW**	**LF**			
		CENTERVILLE ROAD				
		105+35 - 106+75		560.00	0014	01
		106+75 - 107+90		230.00	0014	01
		99+25 - 104+20		850.00	0014	01
		AS DIRECTED BY THE ENGINEER		160.00	0014	01
		Item T20.2014 Total:		**1,800.00**		
S113	**T20.2016**	**6 INCH EPOXY RESIN PAVEMENT MARKINGS YELLOW**	**LF**			
		ROUTE 2				
		AS DIRECTED BY THE ENGINEER		155.00	0014	01
		NB LEFT EDGE LINE		690.00	0014	01
		SB LEFT EDGE LINE		655.00	0014	01
		Item T20.2016 Total:		**1,500.00**		
S114	**T20.2018**	**8 INCH EPOXY RESIN PAVEMENT MARKINGS YELLOW**	**LF**			
		CENTERVILLE ROAD				
		WB LT LANE		100.00	0014	01
		Item T20.2018 Total:		**100.00**		
S115	**T20.2020**	**EPOXY RESIN PAVEMENT ARROW - STRAIGHT, LEFT, RIGHT, OR COMBINED STANDARD 20.1.0**	**EACH**			
		CENTERVILLE ROAD				
		EB LT LANE		2.00	0014	01
		RTE 2 SB OFF-RAMP		2.00	0014	01
		WB LT LANE		2.00	0014	01
		Item T20.2020 Total:		**6.00**		
116	**201.0414**	**REMOVE AND DISPOSE PIPE - ALL SIZES**	**LF**			

Distribution of Quantities

Project Name - Centerville Road Bridge No. 425 Rehabilitation
Estimate Name - Addendum No. 3
R.I. Contract No. - 2017-CB-078
FAP Nos: BHO-0425(001)

Item No.	Item Code	Description	UM	Qty.	Pay Code	Seq. No.
116	**201.0414 Cont.**	BRIDGE NO. 425				
		BRIDGE NO. 425		110.00	0014	01
		Item 201.0414 Total:		**110.00**		
117	**702.9910**	**INSTALL 8" POLYETHYLENE GAS MAIN AND FITTINGS ON APPROACHES**	**LF**			
		BRIDGE NO. 425				
		APPROACHES		200.00	0014	01
		Item 702.9910 Total:		**200.00**		
118	**702.9911**	**INSTALL 8" STEEL GAS MAIN AND FITTINGS ON BRIDGE**	**LF**			
		BRIDGE NO. 425				
		ON BRIDGE		150.00	0014	01
		Item 702.9911 Total:		**150.00**		

7. WASHERS MEETING ASTM DESIGNATION F436 ARE TO BE USED OVER ALL HOLES THAT ARE MORE THAN 1/16" IN DIAMETER GREATER THAN THE BOLT DIAMETER AND UNDER ALL PARTS TURNED DURING ASSEMBLY.
8. PRIOR TO FABRICATION, ALL MATERIALS SHALL BE BLAST-CLEANED TO AT LEAST SSPC-SP6 TO REMOVE ALL OIL, DIRT, GREASE, MILL SCALE AND OTHER DELETERIOUS MATERIALS FROM THE SURFACES OF THE STEEL TO BE FABRICATED.
9. PRIOR TO SHOP COATING AS SPECIFIED IN SECTION 825 OF THE RI STANDARD SPECIFICATIONS, ALL CORNERS AND EDGES OF STEEL WHICH HAVE BEEN FLAME CUT OR OTHERWISE HARDENED SHALL BE SOFTENED BY GRINDING OR BLAST-CLEANING TO PROVIDE A SURFACE SUITABLE FOR APPLICATION OF THE SPECIFIED PAINT SYSTEM.
10. WELDING OF ATTACHMENTS TO GIRDER FLANGES OR WEBS FOR CONSTRUCTION PURPOSES IS NOT PERMITTED EXCEPT WHEN APPROVED BY THE ENGINEER.
11. ALL SHEAR STUD CONNECTORS SHALL BE WELDED BY THE AUTOMATIC TIMED ELECTRIC ARC PROCESS. SHEAR STUDS SHALL BE INSPECTED AND TESTED IN ACCORDANCE WITH SECTION 824 OF THE RI STANDARD SPECIFICATIONS.
12. WHEN STEEL DIE STAMPS ARE USED TO IDENTIFY PIECES AND MEMBERS, FABRICATORS SHALL UTILIZE LOW STRESS STAMPS.
13. THE STEEL ERECTOR/CONTRACTOR FOR THIS PROJECT SHALL BE CERTIFIED FOR "ADVANCED CERTIFIED STEEL ERECTOR (ASCE)" IN ACCORDANCE WITH THE AISC QUALITY CERTIFICATION PROGRAM. THE ERECTOR/CONTRACTOR OF THE STRUCTURAL STEEL SHALL BE REQUIRED TO SUBMIT PROOF OF CURRENT CERTIFICATION AS SPECIFIED.

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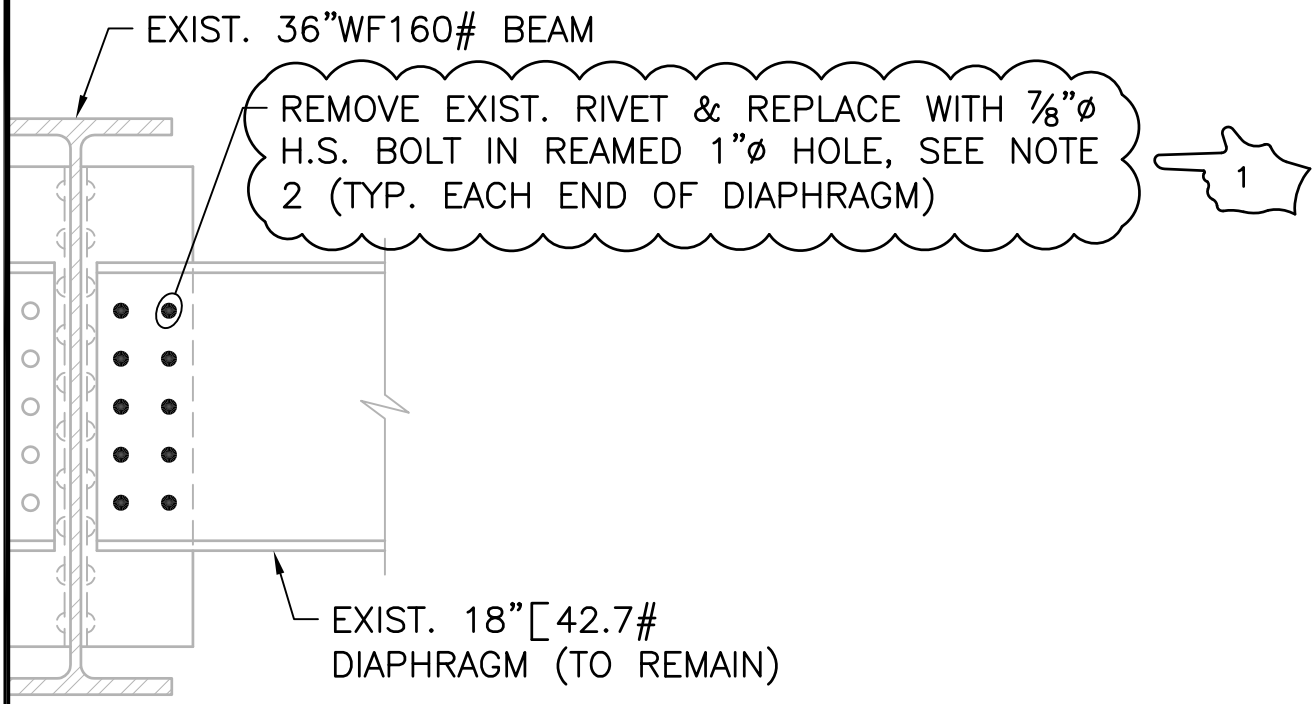
Gordon R. Archibald, Inc. Civil and Environmental Engineers	TITLE OF SKETCH **REHABILITATION OF CENTERVILLE ROAD BRIDGE NO. 425** **BRIDGE GENERAL NOTES - 2**	R.I. CONTRACT NO. 2017–CB–078 **SKETCH NO. 1**
DATE: 2/07/2018	ADDENDUM NUMBER 3	REVISION TO SHEET NO. 4



ES:

HIS DETAIL PERTAINS TO ALL INTERMEDIATE DIAPHRAGMS OCATED WITHIN BAYS BENEATH THE CLOSURE POURS AS OTED IN SECTIONS.

XISTING RIVETS SHALL BE REPLACED WITH H.S. BOLTS, STALLED FINGER–TIGHT, PRIOR TO THE REMOVAL OF HE EXISTING CONCRETE DECK WITHIN A STAGE ADJACENT O THE DIAPHRAGM. FINAL TIGHTENING OF THE BOLTS HALL BE COMPLETED JUST PRIOR TO PLACING ONCRETE IN THE CLOSURE POUR BETWEEN ADJACENT TAGES.

DIAPHRAGM DETAIL

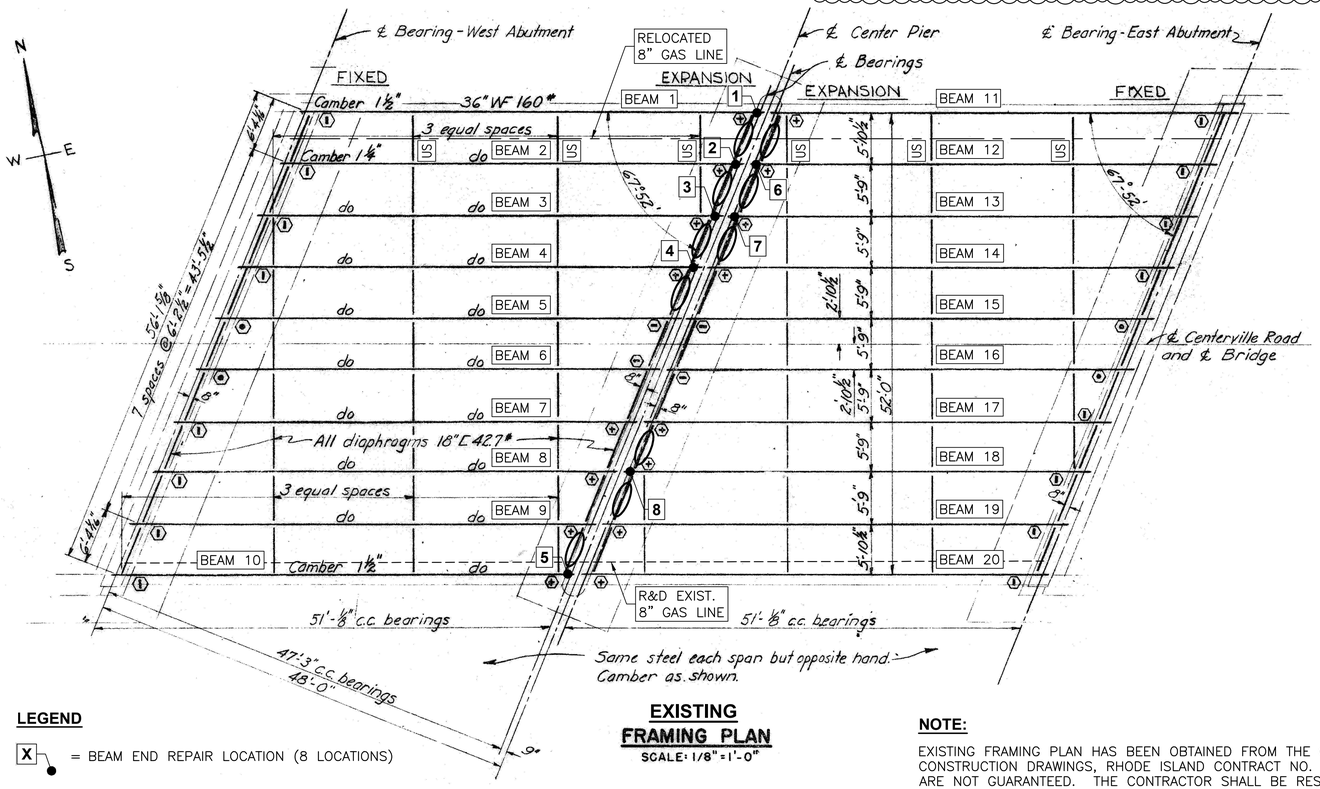
SCALE: 1" = 1'–0"

Gordon R. Archibald, Inc. Civil and Environmental Engineers	TITLE OF SKETCH **REHABILITATION OF CENTERVILLE ROAD BRIDGE NO. 425** **SEQUENCE OF CONSTRUCTION**	R.I. CONTRACT NO. 2017–CB–078 **SKETCH NO. 2**
DATE: 2/07/2018	ADDENDUM NUMBER 3	REVISION TO SHEET NO. 8

FED. ROAD DIV. NO.	STATE	FEDERAL AID PROJECT NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
1	RI	BHO-0425(001)	2017	15	38

GAS MAIN PROTECTION NOTES

1. NO OPEN FLAME CUTTING SHALL BE ALLOWED WITHIN THE BAY CONTAINING THE GAS MAIN.
2. GAS MAIN PROTECTION SHALL BE INSTALLED PRIOR TO BEGINNING STEEL REPAIR AND DIAPHRAGM REPLACEMENT WORK.
3. GAS MAIN PROTECTION SHALL BE PROVIDED DURING PAINTING OPERATIONS.



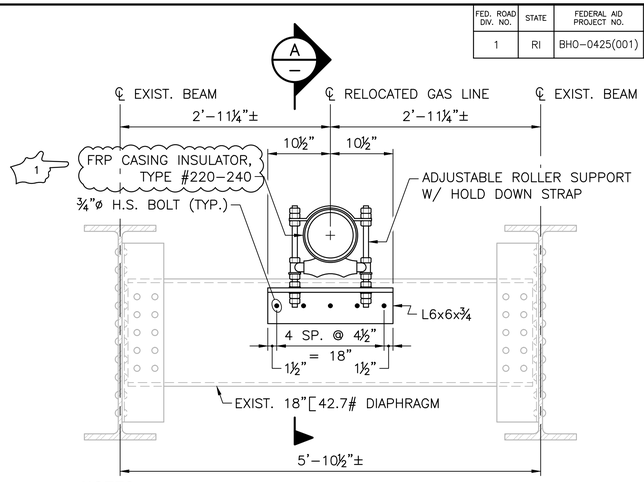
EXISTING FRAMING PLAN
SCALE: 1/8" = 1'-0"

LEGEND

- X = BEAM END REPAIR LOCATION (8 LOCATIONS)
- ⬭ = REMOVE EXIST. DIAPHRAGM AND REPLACE WITH NEW MC18x42.7 DIAPHRAGM (10 LOCATIONS)
- US = UTILITY SUPPORT (6 LOCATIONS)

NOTE:

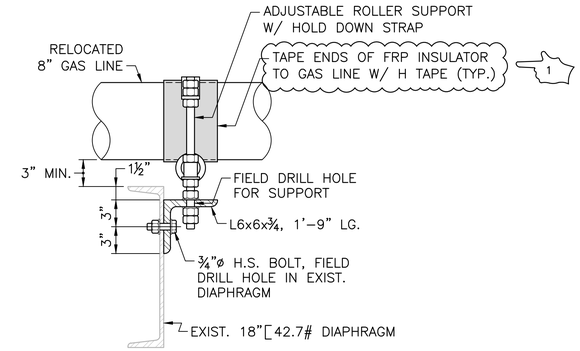
EXISTING FRAMING PLAN HAS BEEN OBTAINED FROM THE ORIGINAL CONSTRUCTION DRAWINGS, RHODE ISLAND CONTRACT NO. 5101, AND ARE NOT GUARANTEED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE EXISTING CONDITIONS PRIOR TO CONSTRUCTION.



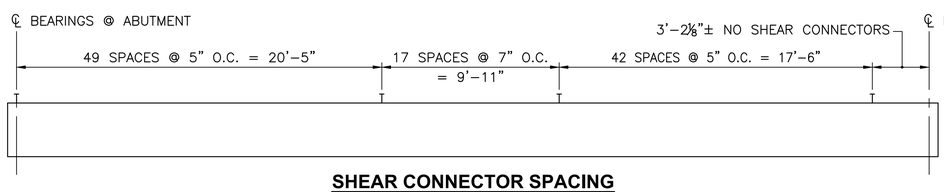
NOTES:

1. STEEL SUPPORT ANGLE SHALL BE PREPARED AND PRIMED IN THE SHOP. THE INTERMEDIATE AND FINAL TOP COAT SHALL BE APPLIED IN THE FIELD.
2. EXISTING STEEL CONTACT SURFACES SHALL BE CLEANED AND PRIMED IN ACCORDANCE WITH ITEM CODE 825.9910 IMMEDIATELY PRIOR TO INSTALLING NEW STEEL SUPPORT ANGLE.
3. GAS LINE TO BE INSTALLED WITH A MINIMUM CLEARANCE OF 8" FROM THE TOP OF THE PIPE TO THE UNDERSIDE OF THE SIDEWALK SLAB. CONTRACTOR SHALL FIELD VERIFY LOCATION OF EXIST. DIAPHRAGM, PRIOR TO INSTALLING THE SUPPORT ANGLES, TO ENSURE THIS CLEARANCE CAN BE OBTAINED. IF THIS CLEARANCE CANNOT BE OBTAINED, THE ENGINEER SHALL BE CONTACTED, AND ANY ADJUSTMENTS APPROVED, PRIOR TO INSTALLING THE SUPPORT ANGLES.

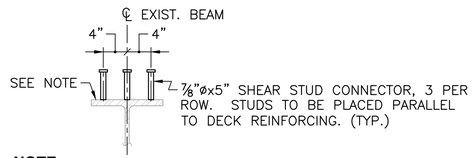
UTILITY SUPPORT - US
SCALE: 1" = 1'-0"



SECTION
SCALE: 1½" = 1'-0"



SHEAR CONNECTOR SPACING
NOT TO SCALE



NOTE:

THE CONTRACTOR SHALL PREPARE THE TOP SURFACE OF THE FLANGE TO ENSURE THAT NO CONDITIONS EXIST THAT WOULD ADVERSELY AFFECT THE WELDING OPERATION. THE ENGINEER SHALL APPROVE THE CONDITION OF THE SURFACE PRIOR TO ANY WELDING OF THE SHEAR CONNECTORS. ANY WORK REQUIRED TO CORRECT THE CONDITION OF THE SURFACE SHALL BE DONE BY THE CONTRACTOR AT NO ADDITIONAL COST.

SHEAR CONNECTOR DETAIL
SCALE: 1" = 1'-0"

REVISIONS		
NO.	DATE	BY
1	2/07/18	JSC

RHODE ISLAND
DEPARTMENT OF TRANSPORTATION

REHABILITATION OF
CENTERVILLE ROAD BRIDGE NO. 425

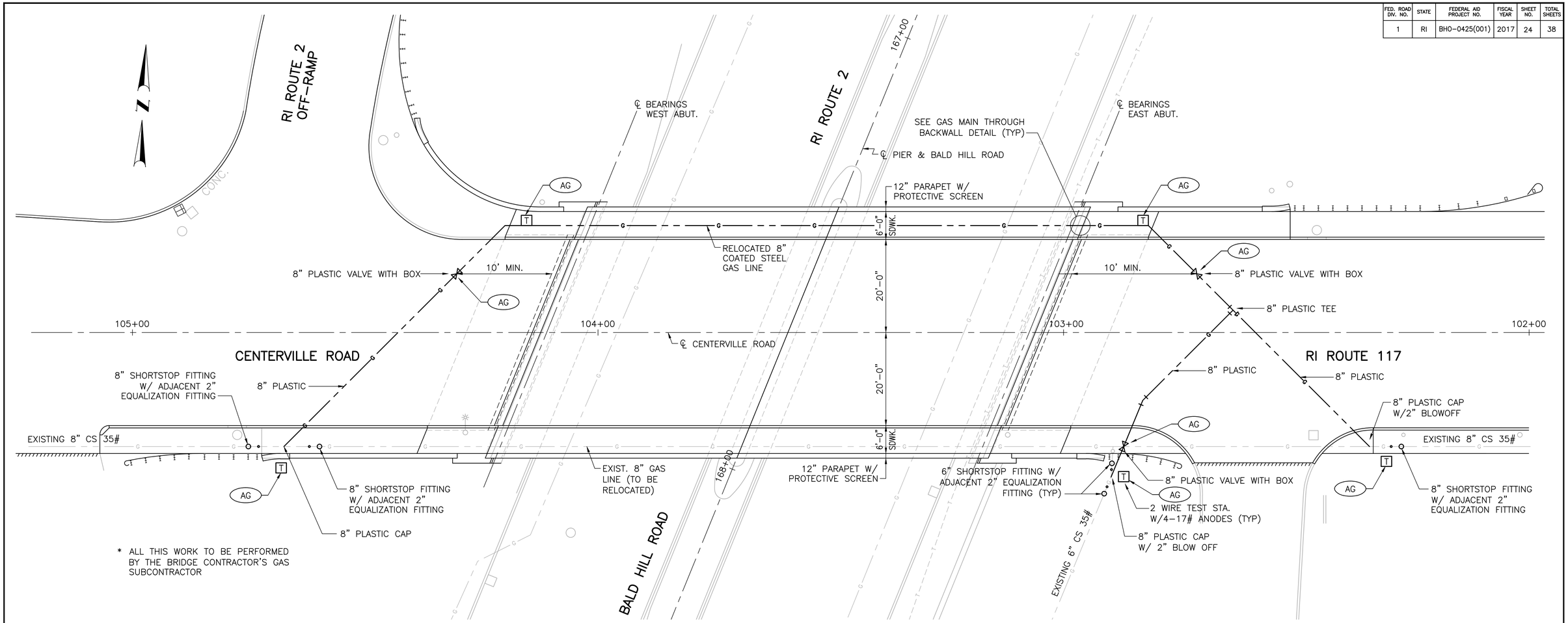
WARWICK, RHODE ISLAND

EXISTING FRAMING PLAN

CHECKED BY _____ DATE _____ SCALE AS SHOWN

Gordon R. Archibald, Inc.
Civil and Environmental Engineers
Pawtucket, Rhode Island

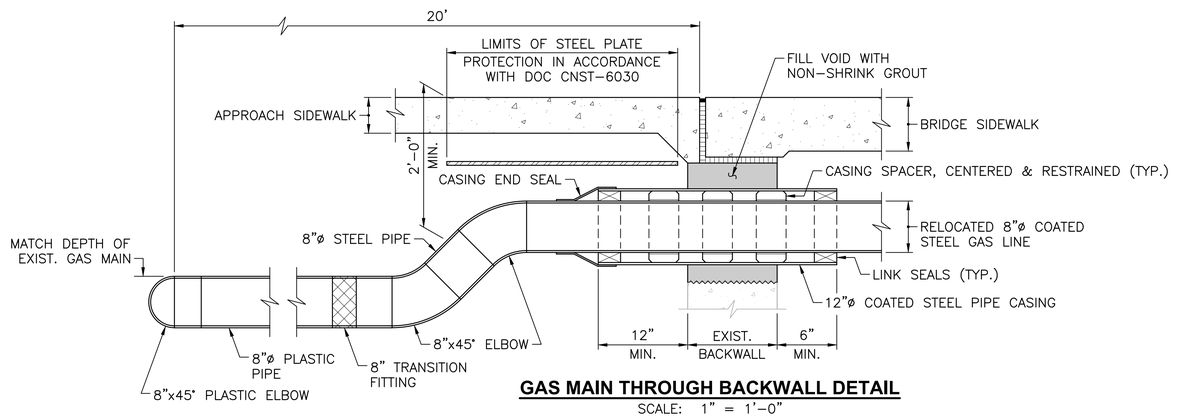
FED. ROAD DIV. NO.	STATE	FEDERAL AID PROJECT NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
1	RI	BHO-0425(001)	2017	24	38



* ALL THIS WORK TO BE PERFORMED BY THE BRIDGE CONTRACTOR'S GAS SUBCONTRACTOR

GAS LINE INSTALLATION PLAN

SCALE: 1" = 10'



GAS MAIN THROUGH BACKWALL DETAIL

SCALE: 1" = 1'-0"

1 ENTIRE SHEET REVISED

REVISIONS		
NO.	DATE	BY
1	2/07/18	JSC

RHODE ISLAND
DEPARTMENT OF TRANSPORTATION

REHABILITATION OF
CENTERVILLE ROAD BRIDGE NO. 425

WARWICK, RHODE ISLAND

MISCELLANEOUS DETAILS - 2

Gordon R. Archibald, Inc.
Civil and Environmental Engineers
Pawtucket, Rhode Island

CHECKED BY _____ DATE _____ SCALE AS SHOWN

DEMOLITION NOTES

1. EXISTING DETAILS, DIMENSIONS AND ELEVATIONS SHOWN HEREIN HAVE BEEN OBTAINED FROM THE ORIGINAL CONSTRUCTION PLANS (RHODE ISLAND CONTRACT NO. 5101) AND ARE NOT GUARANTEED. THE CONTRACTOR SHALL CONDUCT HIS OWN INDEPENDENT EXAMINATION OF SITE CONDITIONS AND TAKE MEASUREMENTS OF EXISTING FEATURES FOR THE PURPOSE OF BIDDING AND DEMOLITION ASSOCIATED WITH THIS PROJECT. ANY RECOURSE UPON INFORMATION MADE AVAILABLE BY THE ENGINEER SHALL BE AT THE CONTRACTOR'S RISK.
2. ACTUAL BELOW GRADE CONDITIONS ARE UNKNOWN.
3. THE CONTRACTOR SHALL NOTE THE PRESENCE OF HAZARDOUS MATERIALS INCLUDING BUT NOT LIMITED TO LEAD PAINT. THE CONTRACTOR SHALL REFER TO THE PLANS AND SPECIAL PROVISIONS FOR FURTHER INFORMATION.
4. FOR EXISTING UTILITIES NOT SHOWN WITHIN THE DEMOLITION DETAILS, SEE THE BRIDGE GENERAL PLAN.
5. AFTER REMOVAL OF THE EXISTING GAS LINE, PLUG THE ENDS WITH 12" MIN. OF MORTAR. THIS WORK SHALL BE CONSIDERED INCIDENTAL TO THE R&D OF THE PIPE; NO ADDITIONAL PAYMENT WILL BE MADE.

1

SPOSE AREA

REVISIONS		
NO.	DATE	BY
1	2/07/18	JSC

RHODE ISLAND
DEPARTMENT OF TRANSPORTATION

REHABILITATION OF
CENTERVILLE ROAD BRIDGE NO. 425
WARWICK, RHODE ISLAND

DEMOLITION DETAILS

Gordon R. Archibald, Inc.
Civil and Environmental Engineers
Pawtucket, Rhode Island

Gordon R. Archibald, Inc.
Civil and Environmental Engineers

TITLE OF SKETCH
REHABILITATION OF CENTERVILLE ROAD BRIDGE NO. 425
DEMOLITION DETAILS

R.I. CONTRACT NO. 2017–CB–078

SKETCH NO. 3

DATE: 2/07/2018

ADDENDUM NUMBER 3

REVISION TO SHEET NO. 25

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