

July 10, 2013

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATION
DEPARTMENT OF ADMINISTRATION

DIVISION OF PURCHASES BID NO. 7468370

RHODE ISLAND DEPARTMENT OF TRANSPORTATION

RHODE ISLAND CONTRACT NO.2012-CB-001

FEDERAL-AID PROJECT NO. FAP Nos: BRO-0182(002)

Replacement of Central Bridge No. 018201 & Access Improvements to Route 114

Sta. 0+56.00 to Sta. 16+38.00

CITY/TOWN OF Barrington

COUNTY OF BRISTOL

NOTICE TO PROSPECTIVE BIDDERS

ADDENDUM NO. 4 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. Distribution of Quantities

1. Index

Delete the Index in its entirety and insert Index (R-4) attached to this Addendum No. 4. Item Code 804.9906 has been added.

2. Cathodic Protection System

Replace Page 44(R-1) of 44 with Page 44(R-2) of 44 attached to this Addendum No. 4. Item 804.9906, Cathodic Protection System, has been added.

B. Specifications - Job Specific

1. Cathodic Protection System

Replace Page JS-iv with Page JS-iv(R-1) and insert Pages JS-189 to JS-191 attached to this Addendum No. 4. Item 804.9906, Cathodic Protection System, has been added.

2. Water Main

Replace Pages JS-64(R-1) and JS-67 with Pages JS-64(R-2) and JS-67(R-1) attached to this Addendum No. 4. The pipe bedding material has been changed to Bedding Sand and a reference to AWWA Standard C600 has been added.

3. Water Main on Bridge

Replace Page JS-74 with Page JS-74(R-1) attached to this Addendum No. 4. An expansion joint requirement has been added to the Materials section.

C. Drawings/Plans - Change/Addition

1. Sheet 63A - Cathodic Protection of Steel Pipe Piles
Insert Sheet 63A attached to this Addendum No. 4. Details for the Cathodic Protection System have been added.
2. Sheets 5 and 10
Sheets 5 and 10 are modified as shown in Sketches 27 and 28 attached to this Addendum No. 4. An expansion joint has been added to the water main on the bridge.
3. Sheet 28 - Details-1
Sheet 28 is modified as shown in Sketch 29 attached to this Addendum No. 4. The bedding material in the "Typical Trench for Water Main Installation" detail has been changed to sand.



RI Department of Transportation
Chief Engineer

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		SW RETURN WALL		29.00	0010	01
		SW WALL		55.00	0010	01
		WEST ABUTMENT		83.00	0010	01
Item 808.9905 Total:				389.00		
S178	804.9906	CATHODIC PROTECTION SYSTEM	LS			
		BRIDGE				
		BRIDGE		1.00	0010	01
Item 804.9906 Total:				1.00		

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JOB SPECIFIC
CODE 804.9906
CATHODIC PROTECTION SYSTEM

DESCRIPTION: The Work covered under this item consists of furnishing all plant, labor, materials, and equipment and performing all operations in connection with the furnishing, installation, and testing of the cathodic protection system on the pipe piles of Piers 1, 2, 3 and 4. The cathodic protection system for Piers 1, 2, 3 and 4 consists of galvanic anodes connected directly to the piles.

The following standards are an integral part of this section of these specifications:

1. NACE International Standard Practice SP0169-2007: "Control of External Corrosion on Underground or Submerged Metallic Piping Systems" latest revision.
2. NACE International Standard Test Method TM0497: "Measurement Techniques Related to Criteria for Cathodic Protection on Underground or Submerged Metallic Piping Systems", latest revision.
3. NACE International Standard Practice SP0387-2006: "Metallurgical and Inspection Requirements for Cast Galvanic Anodes for Offshore Applications", latest revision.
4. SSPC SP10, Near White Metal Blast Cleaning

SUBMITTALS: At least six weeks prior to the installation of the anodes, the Contractor shall submit to the Engineer for approval, the name(s), address(es) and qualifications of the subcontractor(s) intended to use to install the anodes and test the finished system. The Contractor shall submit certificates of conformance or compliance certifying that the anodes meet the requirements specified herein. In addition to the above, upon final testing of the system, the Contractor shall test the cathodic protection system to verify that the piles are protected from corrosion and submit a report to the Engineer detailing the results of the testing.

MATERIALS: The Contractor shall furnish all labor, supervision, materials, equipment, and related hardware required for installing and testing the anodes for Piers 1, 2, 3 and 4. The anodes shall be cast of an aluminum-zinc-indium alloy, with a nominal anode weight of 120 pounds. The anode manufacturer shall provide certification that the anodes meet the following composition and properties tested in accordance with SP0387-2006:

Element	Percent
Zinc	2.8 to 3.5
Indium	0.01 to 0.02
Silicon	0.20 max.
Copper	0.006 max.
Iron	0.10 max.
Other, each	0.02 max.
Other, total	0.10 max.
Aluminum	Remainder

Electrochemical properties: The anode material shall conform to the following properties:

Property	Value
Electrode Potential to copper-copper sulfate	-1.15 volt
Nominal efficiency	85 percent
Nominal amperes hours per second	1150

The anodes shall be cast with a cast-in steel core with legs extending from one side to provide a standoff of (nominally) 4 inches in accordance with the corrosion control drawings. The steel core shall be carbon steel flat bar, 1/2 -inch thick by 2-inches wide. The anode shall be nominally 6 inches by 6 inches by 34 inches in length.

Dimensions, tolerances of the anode and the materials and fabrication used for the inserts shall be as listed in SP0387-2006.

Limitations on surface irregularities, cracks, shrinkage and other internal defects shall be as listed in SP0387-2006.

The exposed (external) surface of the anode shall be free from coating. Flush mounted anodes shall be coated on the side facing the mounting surface. The coating shall be minimum 100 microns epoxy mastic.

CONSTRUCTION METHODS:

1. Anodes shall be attached to the piles in a vertical orientation so that the anode is parallel to the pile once installed. The anode shall be secured to the pile by welding the steel pipe core to a doubler or gusset plate then welding the gusset plate to the pile. It is recommended to apply the gusset plates in the field prior to installation on the piles to avoid damage during transit.
2. Welds shall be fully continuous fillet welds using a welding rod and filler material compatible with the pile and anode core and acceptable to the Engineer. Partial or skip welds are not permitted.
3. Welds shall be inspected by the Engineer for conformance to the structure construction welding specifications.
4. Anodes shall be evenly distributed along the length of the submerged portion of the piles according to the drawings. Where required due to shallow depth of water at individual piles, the vertical spacing of the anodes shall be adjusted to achieve a uniform arrangement throughout the pile length. Where the anodes spacing must be adjusted to allow even anode distribution the contractor shall submit the anode layout and spacing for each pile to the Engineer for approval.
5. Anodes shall be stored, handled, and placed in a manner that will minimize their damage.

TESTING: Once installed, the cathodic protection system shall be tested to determine its effectiveness. A potential scan shall be conducted on each pile from the mud line to the bottom of the pile cap using 5 foot increments. The 850 mV copper-copper sulfate reference electrode (use the silver-silver chloride equivalent in seawater) pile-to-reference cell potential criterion of NACE International Standard Practice SP0169 shall be used as the cathodic protection criterion. It will be necessary to use a diver to obtain these readings. Testing shall be conducted under the direction of a NACE International Certificated Cathodic Protection Specialist or Corrosion Specialist. The Specialist shall submit a report to the Owner's Representative that includes all findings, data and conclusions with respect to the testing.

METHOD OF MEASUREMENT: "Cathodic Protection System" will be measured as a Lump Sum.

BASIS OF PAYMENT: "Cathodic Protection System" will be paid for at the Contract Lump Sum price as listed in the Proposal. The price so-stated constitutes full and complete compensation for all labor, materials, tools, equipment, and all other incidentals required to finish the work, complete and accepted by the Engineer.

3. Gaskets shall be specifically compounded new rubber polymer for superior shelf life and resistance to permanent set. Recommended for potable water use.
4. All bolts shall be stainless steel of an approved design meeting the approval of the Engineer.

I. Pipe Bedding

1. Bedding sand shall consist of clean, hard, durable particles not frozen, and shall conform to the following gradation requirements:

<u>Sieve Size</u>	<u>Percent Passing</u>
3/8"	100
No. 4	80-100
No. 10	30-50
No. 40	5-25
No. 100	0-5

2. Backfill Gravel: Where ordered by the Engineer, gravel meeting the following specifications shall be used for backfill:
 - a) Gravel shall consist of natural bank gravel having durable particles graded from fine to coarse in a reasonable uniform combination with no boulders or stones larger than 2 inches in size. It shall be free from slag, cinders, ashes, refuse or other deleterious materials.

- b) Gravel shall meet the following gradation:

<u>Sieve Size</u>	<u>Percent Passing</u>
2"	100
No. 100	3-20
No. 200	0-10

3. Concrete for Thrust Blocks: Concrete for thrust blocks shall be Class "B" having a compressive strength at the end of 28 days of not less than 3,000 psi and shall conform to the requirements of Section 600 "Portland Cement Concrete" of the Rhode Island Standard Specifications for Road and Bridge Construction.
4. Other Materials: All other materials, not specifically described but required for proper and complete installation of the water distribution system shall be subject to the approval of BCWA.

CONSTRUCTION METHODS: Piping for water mains and appurtenances shall be of the types and materials specified herein. The pipe, fittings, accessories, and appurtenances shall be new and unused, and as approved. The interior of the pipe shall be thoroughly cleaned of all foreign matter before being lowered into the trench, and shall be kept clean during laying operations by plugging or other approved method. The full length of each section of pipe shall rest solidly upon the pipe bed, with recesses excavated to accommodate bells and joints. Any pipe that has the grade or joint disturbed after laying shall be taken up and relaid. Pipe shall not be laid in water, or when trench or weather conditions, are unsuitable for the work, except by permission of the Engineer. Water shall be kept out of the trench until the joints have been completed. Any section of pipe found to be defective before or after laying shall be replaced by the Contractor with sound pipe without additional expense. All bends and other locations indicated or directed shall be firmly reinforced with concrete thrust blocks of the size and shape indicated and as directed, and strapped where required, to prevent the pipe, pipe fittings, and appurtenances from being blown off the lines under pressure. Size of thrust blocks shall be determined as shown on the plans or as directed by the Engineer or BCWA.

INSTALLATION: Pipe, fittings, and accessories shall be handled in such a manner as to ensure delivery to the trench in sound, undamaged condition. Particular care shall be taken not to injure the pipe coating or lining and in the case of such damage the coating or lining shall be repaired by the Contractor in an approved manner. No other pipe or material of any kind shall be placed inside of a pipe valve fitting or appurtenance. Proper handling, storing and installation of the pipe and appurtenances shall be used. The installation shall be in accordance with AWWA Standard C600.

- K. Excavated Material: All surface materials which, in the opinion of the Engineer, are suitable for re-use in restoring the surface shall be kept separate from the general excavation material.

All excavated material shall be piled in a manner that will not endanger the work and that will avoid obstructing sidewalks and driveways.

Gutters shall be kept clear or other satisfactory provisions made for street drainage, and natural watercourses shall not be obstructed.

- L. Trenching by Hand: Hand methods for earth excavation shall be employed in locations where interfering structures, utilities, or Owner's services are indicated on the plans or by consultation with representatives of other utilities.

- M. Bedding and Backfilling: Bedding sand shall be placed and compacted to the depth shown on the plans. The bedding material shall be preshaped to a depth equal to the thickness of the pipewall. Bedding pipes on blocks will not be permitted. Recesses shall be excavated for bell and spigot pipe to prevent any loading on the bell. The pipe shall be placed on said previously compacted pre-shaped bedding material. All trench backfilling shall be done in the following manner:

1. Additional bedding sand material shall be deposited uniformly on both sides of the pipe for the entire width of the trench to a depth not higher than the springline of the pipe. This material shall be deposited directly on the previously placed and compacted bedding material in layers not exceeding six (6) inches in loose depth.

Each six (6) inch layer shall be uniformly compacted by tamping under and on each side of the pipe to provide uniformly solid bearing along the full length of the pipe.

2. Above the springline and to a depth of not less than twelve (12) inches over the crown of the pipe, the sand material shall be placed in layers not exceeding nine (9) inches in depth. Each nine (9) inch layer shall be hand or mechanically tamped and consolidated to a density equal to ninety (90) percent of maximum compaction as determined in accordance with Method A or D of AASHTO Test Designation: T 1980.
3. From a point twelve (12) inches over the crown of the pipe to the existing ground level, in non- roadway areas and to within 14" of the surrounding grade in paved roadway areas, the upper sections of the trenches shall be backfilled with material consisting of sound tough durable particles of crushed or uncrushed gravel, sand or native material free of soft elongated pieces, vegetable matter or other deleterious substances having no stone larger than eight (8) inches in size. This material shall be placed in layers not exceeding twelve (12) inches in depth and shall be mechanically consolidated to a degree of compaction equal to the adjoining trench walls and capable of sustaining vehicle traffic immediately upon completion. The mechanical compaction of the upper twelve (12) inch layers shall be affected by at least four (4) passes of an approved type of mechanical tamper, each pass of the equipment shall cover the entire area of the backfill surface. Moisture content of backfill materials shall be proper at all times to produce the optimum density, and puddling of the backfill will be permitted only with the express consent of the Engineer.
4. In non-roadway areas top surfaces of backfilled trenches shall be left free of loose materials and only slightly rounded above the adjoining surfaces.

- b) The insulated material shall be ridged polyurethane foam with a density of 2.2 to 3 lbs/feet, (ASTM D1622), less than 4% moisture absorption and a compressive strength of 30 lbs/in² standard operating temperatures will be -49°F to 250°F.
 - c) The outer jacket shall consist of 50 mil UV inhibited polyethylene jacket minimum tensile strength of 55 lbs/in. with Butyle Rubber Sealant.
2. Insulation Adhesive
- a) Insulation adhesive shall be a 2-part urethane modified asphaltic adhesive for bonding insulation to itself or to pipe surfaces.
3. Fabricated asphalt emulsion coating shall be used to seal the ends of all buried insulation material.
- D. Insulation Sealant: A fabricated asphalt emulsion coating shall be used to seal the ends of all buried insulation material.
- E. Support hardware shall be supplied by Piping Technology & Products, Inc., PHD Manufacturing, Inc., Osburn Associates, Inc., or approved equal.
- F. At the backwall, the space between the pipe and steel pipe sleeve shall be sealed using a neoprene type compression seal as shown on the plans. All work shall be approved by BCWA prior to installing compression seal.
- G. Expansion Joints: Expansion joints shall be TR TELE FLEX Coupling or approved equal.

CONSTRUCTION METHODS:

A. Ductile Iron Pipe

- 1. Ductile Iron Pipe and appurtenant materials shall be installed in accordance with the Manufacturer's instructions.
- 2. Any and all field installation of insulation shall be done in such a manner as to provide watertight joints.

METHOD OF MEASUREMENT: "Furnish And Install 8-Inch Diameter Water Main on Bridge No. 182" will be measured by the number of linear feet of pipe actually installed in accordance with the plans and/or as directed by the Engineer. Measurement will be made between the back faces of backwalls at the abutments.

BASIS OF PAYMENT: "Furnish And Install 8-Inch Diameter Water Main on Bridge No. 182" 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 labor, tools, materials (including supports, seals, expansion joints, and insulation), equipment, transportation, cleaning, pressure testing of pipe, and other incidentals required to finish the work, complete in place and accepted by the Engineer and BCWA.

NUP NEW UTILITY POLE

NWBO FURNISH AND INSTALL NEW 2" BLOWOFF VALVE AND BOX

NWEJ FURNISH AND INSTALL NEW WATER MAIN EXPANSION JOINT

P BITUMINOUS CONCRETE PAVEMENT



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8 BLACKSTONE VALLEY PLACE
LINCOLN, RI 02885
401-334-4100

**JOB SPECIFIC PLAN
SYMBOLS, LEGEND,
& NOTES**

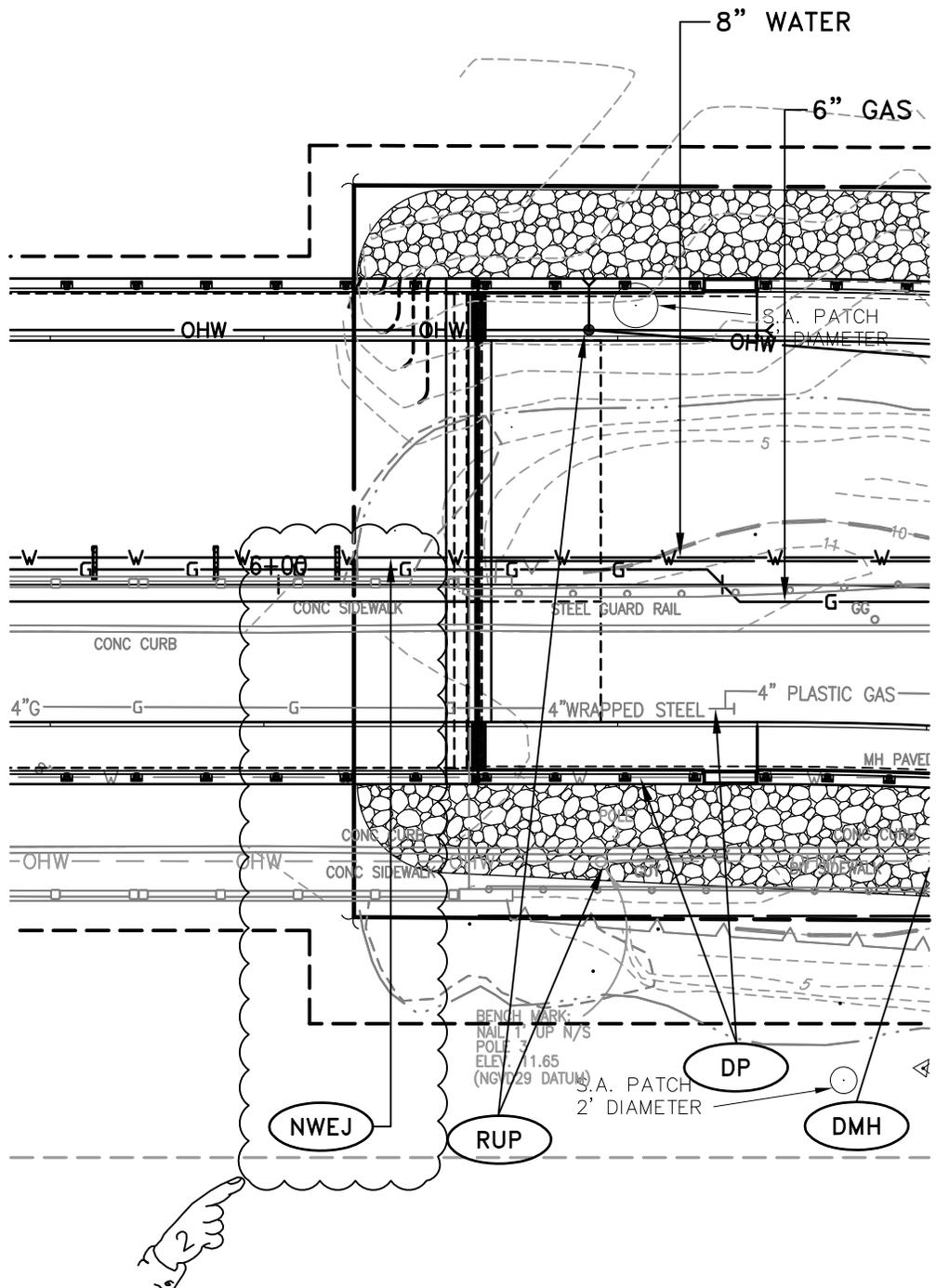
R.I. CONTRACT
No.
2012-CB-001

SKETCH
No.
27

7/8/13

ADDENDUM No. 4

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DRAINAGE AND UTILITY PLAN No. 1

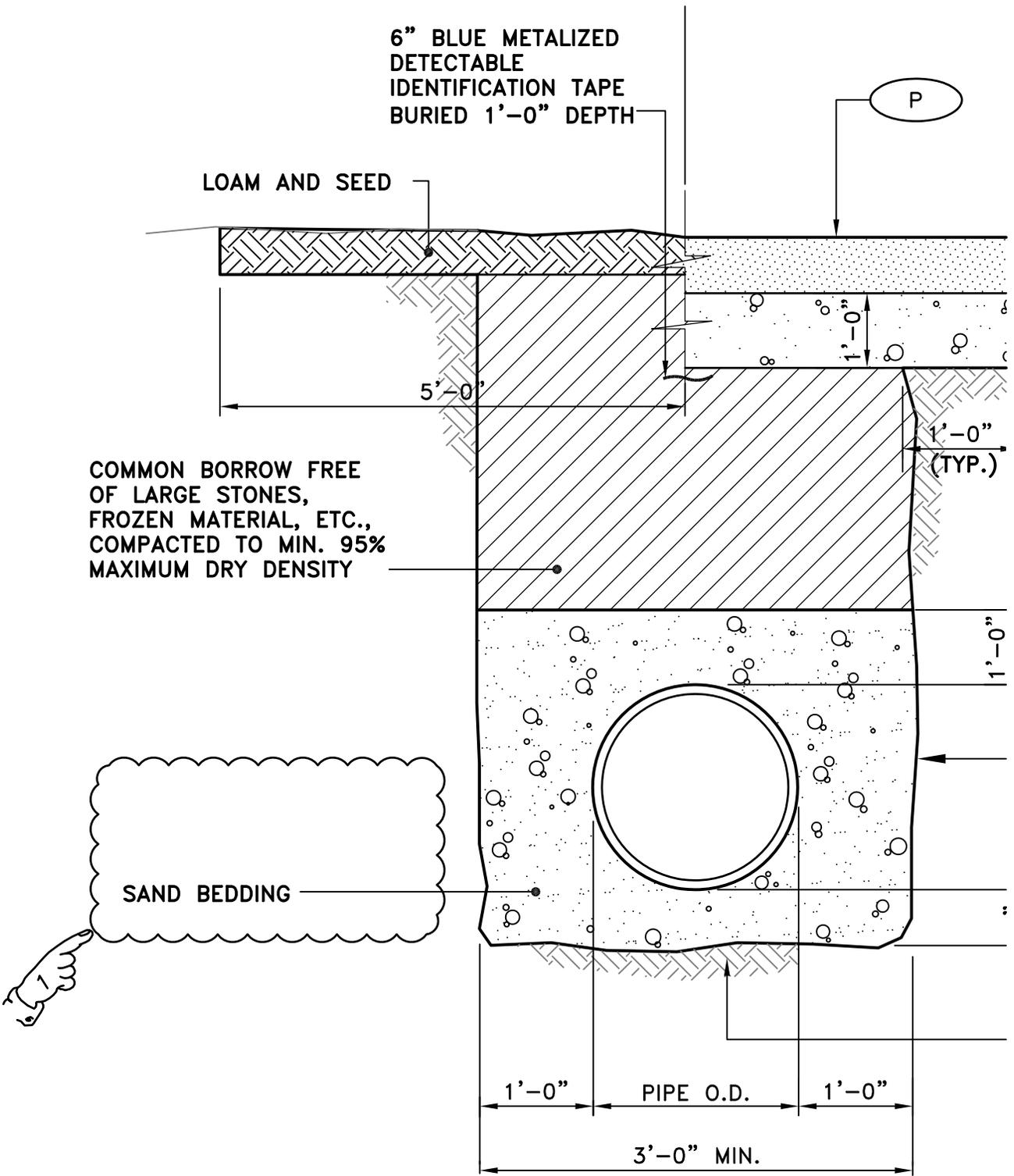
R.I. CONTRACT
 No.
2012-CB-001

SKETCH
 No.
28

7/8/13

ADDENDUM No. 4

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TYPICAL TRENCH FOR WATER MAIN IN
NOT TO SCALE

 <p>PARE CORPORATION ENGINEERS - SCIENTISTS - PLANNERS 8 BLACKSTONE VALLEY PLACE LINCOLN, RI 02865 401-334-1100</p>	<p>DETAILS - 1</p>	<p>R.I. CONTRACT No. 2012-CB-001</p>	<p>SKETCH No. 29</p>
<p>7/8/13</p>	<p>ADDENDUM No. 4</p>	<p>REVISION TO SHEET 28 of 103</p>	