

NOVEMBER 20, 2018
REHABILITATION OF BRIDGE NO. 00196
I-95 OVER US ROUTE 1
FEDERAL AID PROJECT NO. 0952(118)
STATE PROJECT NO. 0014 – 0185
TOWN OF BRANFORD

ADDENDUM NO. 3

This Addendum addresses the following questions and answers contained on the “CT DOT QUESTIONS AND ANSWERS WEBSITE FOR ADVERTISED CONSTRUCTION PROJECTS”:

Question and Answer No. 67

REVISED SPECIAL PROVISION

The Special Provision for the following items is hereby deleted in its entirety and replaced with the attached like-named Special Provision:

- ITEM #1301966A – 8” SOLID SLEEVE
- ITEM #1301968A - 12” SOLID SLEEVE
- ITEM #1302004A – 8” GATE VALVE
- ITEM #1302006A - 12” GATE VALVE
- ITEM #1400000A – TEST PIT EXCAVATION (SANITARY SEWER)
- ITEM #1400003A – TRENCH EXCAVATION 0’-10’ DEEP (SANITARY SEWER)
- ITEM #1400004A – ROCK IN TRENCH EXCAVATION 0’-10’ DEEP (SANITARY SEWER)
- ITEM #1400051A – DEWATERING (SANITARY SEWER)
- ITEM #1401242A – 8” DUCTILE IRON PIPE (SANITARY SEWER)
- ITEM #1401254A – 12” DUCTILE IRON PIPE (SANITARY SEWER)
- ITEM #1401991A – 1/2” CRUSHED STONE BEDDING (SANITARY SEWER)
- ITEM #1401994A – SAND BLANKET COVER (SANITARY SEWER)
- ITEM #1403608A – REMOVAL OF EXISTING SANITARY SEWER
- ITEM #1405081A – GRANULAR FILL (SANITARY SEWER)

The Bid Proposal Form and Detailed Estimate Sheets are not affected by this change.

There will be no change in the number of calendar days due to this Addendum.

The foregoing is hereby made a part of the contract.

ITEM #1301966A – 8” SOLID SLEEVE

ITEM #1301968A - 12” SOLID SLEEVE

ITEM #1302004A – 8” GATE VALVE

ITEM #1302006A - 12” GATE VALVE

ITEM #1400000A – TEST PIT EXCAVATION (SANITARY SEWER)

ITEM #1400003A – TRENCH EXCAVATION 0’-10’ DEEP (SANITARY SEWER)

ITEM #1400004A – ROCK IN TRENCH EXCAVATION 0’-10’ DEEP (SANITARY SEWER)

ITEM #1400051A – DEWATERING (SANITARY SEWER)

ITEM #1401242A – 8” DUCTILE IRON PIPE (SANITARY SEWER)

ITEM #1401254A – 12” DUCTILE IRON PIPE (SANITARY SEWER)

ITEM #1401991A – 1/2” CRUSHED STONE BEDDING (SANITARY SEWER)

ITEM #1401994A – SAND BLANKET COVER (SANITARY SEWER)

ITEM #1403608A – REMOVAL OF EXISTING SANITARY SEWER

ITEM #1405081A – GRANULAR FILL (SANITARY SEWER)

Description: The Contractor shall furnish and install ductile iron pipe, of the sizes indicated, and all the fittings and appurtenances to the lines and grades shown on the Contract Drawings, complete as shown, specified or directed, including but not limited to; bends, restraints, couplings, gate valves, gate boxes, tees, transporting materials, digging test pits, the clearing,

ITEM #1301966A, #1301968A
#1302004A, #1302006A, #1400000A
#1400003A, #1400004A, #1400051A
#1401242A, #1401254A, #1401991A
#1401994A, #1403608A, #1405081A

trenching, disposing of unused excavated materials, furnishing, installing and field testing the pipelines complete with pipe restraints, utility identification tape, all trenching, rock removal, refilling trenches, filter fabric, furnishing additional material for refilling, trench compaction/testing, temporary and permanent surface restoration, miscellaneous grading, sheeting, bracing, dewatering and all incidental work where required, to the specifications and details of the Contract Documents.

Materials:

1. Pipe: Ductile Iron conforming to ANSI/AWWA C151/A21.51.

Laying Length: Nominal 18 feet.

Thickness: Thickness Class 56

Unrestrained Joint Type: Push-on type capable of being deflected after assembly conforming to ANSI/AWWA C111/A21.11.

Restrained Joint Type: Boltless, restrained, push-on type capable of being deflected after assembly conforming to ANSI/AWWA C111/A21.11. Designs using set screws or requiring field welding are not acceptable. Acceptable products are as follows:

1. Flex-Ring, as manufactured by American Cast Iron Pipe Company
2. TR-FLEX, as manufactured by McWane Cast Iron Pipe Company
3. TR FLEX, as manufactured by United States Pipe and Foundry Company, LLC
4. Engineer approved equivalent

Joint Gasket: Nitrile (NBR) (Acrylonitrile Butadiene) conforming to ANSI/AWWA C111/A21.11.

Exterior Coating: Asphaltic coating conforming to ANSI/AWWA C151/A21.51.

Interior Lining: Ceramic quartz filled amine cured novalac epoxy lining, minimum 40 mil thickness, Protecto 401 as manufactured by Induron Coatings, Inc. Coat areas damaged by cutting or handling with manufacture's repair kit as directed by manufacturer's written instructions.

2. Fittings: Ductile-Iron conforming to ANSI/AWWA C110/A21.10. Gray-iron fittings or "compact" fittings will not be acceptable. Solid sleeve fittings shall be of the long form. Provide manufacturer's certification as required by paragraph 5.1.3 of ANSI/AWWA C110/A21.10. Pressure Rating: 350 psi rated working pressure

Joint Type: Mechanical joint or Flanged as indicated.

1. Mechanical joints conforming to ANSI/AWWA C111/A21.11 with ductile-iron Restrained glands. Gray-iron glands will not be acceptable.
2. Flanged joints conforming to ANSI/ AWWA C111/A21.11, ductile iron, with full face gaskets.

Joint Gasket: Nitrile (NBR) (Acrylonitrile Butadiene) conforming to ANSI/AWWA C111/A21.11. Gaskets for flanged joints shall be full face.

Exterior and Interior Coating: Exterior coating shall be 46H-413 Hi-Build Tneme Tar as manufactured by Tnemec, Hi-Mil Sher-Tar as manufactured by Sherwin Williams or equal. Interior coating shall be ceramic quartz filled amine cured novalac epoxy lining, minimum 40 mil thickness, Protecto 401 as manufactured by Induron Coatings, Inc. or Series 431 Perma-Shield PL as manufactured by Tnemec. Interior surface holiday testing shall be performed.

ITEM #1301966A, #1301968A
#1302004A, #1302006A, #1400000A
#1400003A, #1400004A, #1400051A
#1401242A, #1401254A, #1401991A
#1401994A, #1403608A, #1405081A

Restrained Glands: Ductile-iron gland with multiple gripping wedges providing mechanical joint restraint. Restrained glands shall conform to the following requirements:

1. Acceptable Products:
 - a. Series 1100 Megalug with Mega-Bond coating, as manufactured by EBAA Iron Sales, Inc.
 - b. Engineer approved equivalent.
2. Restrained glands shall be Listed by Underwriters Laboratories (3” through 24” inch size) and Approved by Factory Mutual (3” through 12” inch size).
3. Restrained glands shall have a working pressure rating of 350 psi for 3-16 inch diameter, and 250 psi for 18-48 inch diameter. Ratings are for water pressure and must include a minimum safety factor of 2 to 1 in all sizes.
4. Restrained gland body, wedges and wedge actuating components shall be cast from grade 65-45-12 ductile iron material in accordance with ASTM A536.
5. Ductile iron gripping wedges shall be heat treated within a range of 370 to 470 BHN.
6. Restrained glands shall be processed through a phosphate wash, rinse, and drying operation and then coated with a epoxy or polyester based heat cured coating.
7. Proper actuation of the gripping wedges shall be ensured with torque limiting twist off nuts.

Mechanical Joint Bolts and Nuts: Cor-Ten T-bolts and nuts conforming to the requirements of ANSI/AWWA C111/A21.11 with minimum 1.2 mil thick blue, resin-bonded, thermally cured, fluoropolymer coating.

Flanged Joint Bolts and Nuts: Type 316L stainless steel, hex head conforming to ASTM F593 or ASTM F594 as applicable. Threads shall be coated with Never-Seez anti-seize and lubricating compound as manufactured by Bostik, Inc.

3. **Polyethylene Encasement:** V-Bio™ co-extruded 3-layer linear low density polyethylene film conforming to the requirements of ANSI/AWWA C105/A21.5 and ASTM A674. Provide Affidavit of Compliance as described in Section 5.1.2 of ANSI/AWWA C105/A21.5.

4. **Resilient Seated Gate Valves:** Conform to the requirements of ANSI/AWWA C515 as modified herein. Provide catalog data, assembly drawings, and manufacturer’s affidavit as required by Section 6.3 of ANSI/AWWA C515.

Acceptable manufacturers:

1. American Flow Control
2. Clow Valve Company
3. Mueller Company
4. Engineer approved equal.

Operator: Non rising stem with wrench nut operator. Valve opening direction to be clockwise (open right). All cast ferrous components shall be ductile-iron. Valve stem seal shall be O-ring type, replaceable under pressure.

ITEM #1301966A, #1301968A
 #1302004A, #1302006A, #1400000A
 #1400003A, #1400004A, #1400051A
 #1401242A, #1401254A, #1401991A
 #1401994A, #1403608A, #1405081A

Valve Ends: Mechanical joint conforming to ANSI/AWWA C111 with Nitrile (NBR) (Acrylonitrile Butadiene) gaskets and ductile-iron restrained glands.

Bolting: Valve bolts, studs and nuts shall be Type 304L stainless steel conforming to ASTM F593 or ASTM F594 as applicable with an anti-galling coating.

Interior and Exterior Coatings: Fusion bonded epoxy coating conforming to ANSI/AWWA C550. Interior surface holiday testing shall be performed.

5. **Valves Boxes:** Valve Boxes to be manufactured from cast iron conforming to ASTM A48 and coated with a water-based bituminous coating. Valve boxes to be two piece adjustable sliding type with 8-inch minimum diameter base section, minimum 5-1/4 inch minimum shaft diameter and cast iron cover. Minimum wall thickness to be 3/16-inch. Valve box to be marked with the word “SEWER” cast into the cover.

Acceptable Manufacturers:

1. Bingham & Taylor
2. Bibby Ste. Croix
3. East Jordan Iron Works
4. Engineer approved equal

6. **Crushed Stone:** Crushed stone shall consist of clean, crushed, non-porous rock, or crushed gravel, uniformly blended. Crushed stone shall meet the gradation requirements of Form 817, Section M.01.01” No. 8

7. **Sand:** Sand shall consist of clean, crushed, non-porous rock, or crushed gravel, uniformly blended conforming to Form 817, M03.01, 2.

8. **Granular Fill:** Select fill shall consist of hard durable sand or sand and gravel, free from trash, organic matter, clay, surface coatings and other deleterious materials. Select fill placed between the mid-height of a pipe and twelve (12) inches above a pipe shall have a maximum stone size of four (4) inches. Select fill used for other purposes shall have a maximum stone size of two thirds of the loose lift thickness and that portion passing the four (4) inch sieve shall meet the following gradation requirements, as determined by ASTM C136 and ASTM C117:

U.S. Sieve Size	Percent Passing
4 inch	100
No. 10	30-100
No. 40	0-70
No. 200	0-15

9. **Utility Warning Tape:** Utility warning tape shall be 6-inch wide, minimum 6-mil thickness, magnetically detectable, green color, imprinted with “CAUTION – BURIED FORCE MAIN LINE” text, as manufactured by Stranco Inc. Michigan City, IN, Reef Industries, Houston, TX or approved equal.

ITEM #1301966A, #1301968A
 #1302004A, #1302006A, #1400000A
 #1400003A, #1400004A, #1400051A
 #1401242A, #1401254A, #1401991A
 #1401994A, #1403608A, #1405081A

10. Extruded Polystyrene Insulation Board: Extruded Polystyrene insulation board shall conform to ASTM C578, Type IV.

Construction Methods:

Perform the work so that no damage occurs to adjacent utilities, structures, property, or any other installation located in or adjacent to Work areas. Damaged utilities shall be repaired with similar or better materials of the same size and to the requirements of the utility owner. Have on site the necessary manpower, materials and equipment such as pumps, piping, and the like as required to protect and maintain uninterrupted flows in existing utilities during construction. Excavations shall be kept free from water, snow and ice during construction. Bedding and backfill material shall not be placed in water. Water shall not be allowed to rise upon or flow over bedding and backfill material. Maintain all benchmarks, monuments and other reference points and, if disturbed, shall replace them at no additional cost to the Owner. Excavating equipment shall be of such size and type, and used in a manner, that will not damage existing items such as, but not limited to, paved surfaces, utilities, structures and/or trees. The finished subgrade shall not be disturbed by traffic or other operations and shall be maintained in a satisfactory condition until the finished surfaces are placed. No pavement materials shall be installed thereon until the Engineer has observed the subgrade is in compliance with this requirement. Take whatever steps necessary to prevent catch basins and drain lines from receiving silt and sediment washed from Project Work areas. Clean out catch basins and drain lines that have not been properly protected.

1. General excavation: Excavation shall consist of the removal of soil, rock, and other materials to the limits shown on the Contract Drawings, specified herein, and as required to provide firm bearing. No structures, pavements, utilities or fill materials of any kind shall be placed in, or upon excavated areas until such areas have been observed by the Engineer. Rippable rock shall be considered earth excavation. Rippable rock is defined as rock which can be excavated using a single tooth hydraulic ripper pulled by a Caterpillar D8 Dozer or equivalent equipment. Excavating equipment shall be of such size and type, and operated in a manner, that will not damage items such as, but not limited to, existing paved surfaces, utilities, structures and trees.

Excavated materials meeting the requirements for the various fill materials specified herein shall be stockpiled for reuse. Unsuitable or excess suitable materials shall be legally disposed of off-site unless otherwise specified.

Excavation shall be to the limits as necessary to install utilities or other facilities unless otherwise specified. Excavation of unsuitable material beyond the limits necessary shall only be performed as authorized by the Engineer. Over-excavation beyond the specified or detailed limits shall be backfilled and properly compacted and at no additional cost to the Owner.

The proposed contour lines and spot grades shown on the Contract Drawings are finish elevations. Excavation to subgrade shall be the distance below these elevations as may be

ITEM #1301966A, #1301968A
 #1302004A, #1302006A, #1400000A
 #1400003A, #1400004A, #1400051A
 #1401242A, #1401254A, #1401991A
 #1401994A, #1403608A, #1405081A

required by the size and thickness of pavements, structures, utilities and surface treatments as shown on the Contract Drawings, details and sections, and/or as specified herein.

Excavate under guy wires, alongside of poles, buildings, and other objects as necessary to complete the Work at no additional cost to the Owner. This may require hand excavation. There shall be no special compensation for this Work unless otherwise noted herein. The relocation of utility poles, and the like, shall be done at no additional cost to the Owner.

Make excavations at locations authorized by the Engineer, for the purpose of confirming the location and depth of existing utilities or structures. Additional experimental excavations may be requested to precisely locate utilities and underground structures that may be affected by the Work. Backfill the experimental excavations with materials meeting the specification for common fill, unless directed otherwise by the Engineer. Backfill of experimental excavation shall be compacted in accordance with the requirements for Trench Backfilling.

2. **Trench excavation:** Trench excavation shall consist of the removal of all materials encountered. Excavations shall be made to accommodate the elevation, depth of cover, or detail shown on the Contract Drawings and/or as specified. Trench widths shall be kept to the minimum practicable but shall be at least three (3) feet wide or two (2) feet plus the diameter of the pipe, whichever is greater. The bottom of the trenches shall be firm and free of water and shall be accurately graded and shaped to allow placement of required bedding beneath the bottom of all barrels, bells or couplings of all pipes installed. Design criteria require that pipe be laid in trench conditions; therefore trenches for utilities in fill areas shall be excavated after all fill materials have been placed, spread and compacted to an elevation at least twelve (12) inches above the top of the proposed utility. This requirement is necessary to fulfill design criteria and should not be construed as a dictation of means and methods of construction. If, through error, the excavations are carried beyond the specified limits, or if inadequate dewatering causes softening of the subgrade that necessitates removal, backfill shall be with gravel fill, placed and compacted as specified hereinafter under Trench Backfilling. Backfill shall be performed at no additional cost to the Owner.

Existing soils, which are considered unsuitable foundation materials by the Engineer, shall be removed to the limits directed by the Engineer. The lateral limit for the excavation of unsuitable material beneath structures shall be defined as the intersection point, with suitable subgrade material, of an imaginary line drawn downward at a 45 degree angle from the outside edge of the foundation. For pipelines, the horizontal limits are defined as two (2) feet plus the diameter of the pipe or a minimum total width of three (3) feet whichever is larger unless otherwise directed by the Engineer. The horizontal limits are defined as two feet outside the outside face of the manholes or catch basin bases.

ITEM #1301966A, #1301968A
#1302004A, #1302006A, #1400000A
#1400003A, #1400004A, #1400051A
#1401242A, #1401254A, #1401991A
#1401994A, #1403608A, #1405081A

The exposed subgrade shall be compacted and the area backfilled with gravel fill. The Engineer shall be present during the excavation of all unsuitable soils in order to permit verification of the limits of and volume of material removed.

3. **Temporary earth support:** Design, furnish, install and maintain temporary earth support systems, as required, to prevent injury to persons, collapse of the sides of the excavation, and damage, disturbance and settlement of adjacent property. Sheeting and bracing shall be of adequate type; size and strength for the conditions encountered and shall be driven to true alignment in a workmanlike manner.

Timber sheeting shall be straight and sound and shall be tongue and grooved where groundwater is encountered. Minimum thickness of timber sheeting shall be a nominal three inches. Steel sheeting shall have a minimum thickness of 3/8 inch. Steel sheeting shall be designed for the conditions encountered and shall be driven tight. Sheeting may be either left in place or removed. Sheeting left in place shall be cut off at least one (1) foot above the crown of the pipe. In no case shall the top of sheeting be left in place within five (5) feet of the finished grade.

Excavated slopes in rock shall be appropriately laid back or be stabilized by rock bolts or other appropriate means. Loose or semi-detached rock shall be scaled from the rock surface. When necessary, wire mesh or other appropriate means shall be installed to prevent injury to workers from falling rock.

Engage an independent Registered Professional Engineer (in the state where the project is located) with experience in the design of temporary earth support to evaluate the proposed methods of excavation and provide guidance regarding proper slopes and to design or provide guidance of temporary earth support during construction. Submit a notarized letter to the Engineer certifying conformance to the above requirements, before the start of any construction.

4. **Control of Water:** Evaluate the impact of the anticipated subsurface soil and groundwater conditions on proposed method of excavation and dewatering and other operations. If subsurface conditions so dictate, provide wells, wellpoints, pumps, or any other facilities to control groundwater and surface water in order to permit work to be performed under dry and stable conditions. Provide any facilities required to remove subsurface water from the construction area in advance of excavation. Dewatering shall continue until all work below groundwater level has been completed or otherwise stabilized against uplift or other disturbance. Pumping shall be continuous where required to protect the Work and to maintain satisfactory progress. All dewatering wells shall be backfilled upon completion of the work.

Control all surface water within the work area. Excavations shall be protected from flooding by surface water by use of berms, ditches or other appropriate means. Pay special attention to areas where difficult soil and groundwater conditions are anticipated and evaluate the subsurface conditions in these areas from the geotechnical data provided in the Contract Document or by other means. All pipeline(s) and structures not stable against uplift during construction or prior

ITEM #1301966A, #1301968A
#1302004A, #1302006A, #1400000A
#1400003A, #1400004A, #1400051A
#1401242A, #1401254A, #1401991A
#1401994A, #1403608A, #1405081A

to completion of installation shall be thoroughly braced or otherwise protected. Dewater in a manner that does not cause loss of ground or disturbance to the bearing soil or soil supporting adjacent structures.

Engage an independent Registered Professional Engineer (in the state where the Project is located) with experience in the design of temporary dewatering systems to evaluate the proposed method(s) for control of water and to design dewatering system(s) or provide guidance during construction. Submit a notarized letter to the Engineer certifying conformance to the above requirements, before the start of any construction.

5. **Pipe Bedding:** Pipe and/or structures shall be placed on specified bedding materials, to provide uniform support and a stable foundation for the pipeline(s) or structure(s) and backfill material. No bedding shall be placed on unstable subgrade soils. An unstable subgrade is defined as a condition of running sand, running silt, quick bottom, or otherwise soft, soupy or spongy bottom. If an unstable condition exists, or develops during the excavation, excavate, dewater and stabilize the subgrade to the extent necessary to provide a firm stable foundation prior to placing bedding, pipe and/or structures. The height of fill adjacent to structures and pipelines shall be increased at approximately the same rate on all sides to prevent displacement.

Pipeline(s) and appurtenant items of Work shall be laid in the bedding material, from the bottom of the excavation to the mid-diameter of the pipe, for the full width of trench. Bedding material shall be compacted to a minimum density of ninety-five (95) percent of the maximum density as determined by ASTM D1557 (Modified Proctor) and shall meet the requirements for gravel fill or crushed stone. The type and thickness of bedding material shall be adjusted based on field conditions, as follows:

- a. Gravel fill or crushed stone bedding material shall be placed to a depth of 6 inches below the pipe as shown on the Contract Drawings and compacted to the top of the pipe as specified hereinbefore.”
- b. The excavation shall be made to a depth of six (6) inches below the bottom of pipe for placement of bedding material.

Where the bottom of the trench excavation is below the groundwater level and pumping of water is done from within the excavation, utilize a bedding system which provides a stable working surface which limits the disturbance of the subgrade and prevents migration or washing of fine soils from the subgrade due to the flow of water into the trench.

Excavation beyond the required limits shall be backfilled with compacted gravel fill at no additional cost to the Owner. Gravel Fill used to replace unsuitable material or unauthorized excavation shall be compacted to a minimum density of ninety-two (92) percent of the maximum density determined by ASTM D1557, (Modified Proctor).

ITEM #1301966A, #1301968A
#1302004A, #1302006A, #1400000A
#1400003A, #1400004A, #1400051A
#1401242A, #1401254A, #1401991A
#1401994A, #1403608A, #1405081A

6. **Pipe and fitting installation:** Verify that excavations are ready to accept pipes, fittings, valves and accessories. Visually inspect pipes, fittings, valves and accessories for damage prior to installation. Mark and remove damaged or defective materials from site. Visually inspect interiors of pipes, fittings and valves for foreign matter and remove if found.

Prepare excavations for installation of pipe, fittings, valves and accessories. Protect stored valves and appurtenances from damage due to exposure to sunlight, heat, dirt, debris, freezing and thawing, vandalism, etc.

Install pipe, fittings, valves and appurtenances in accordance with the requirements of ANSI/AWWA C600 except as modified herein. Handle pipe with non-metallic slings so as not to damage pipe exterior coating. Repair cuts, nicks, and scrapes to interior and exterior pipe coatings prior to pipe installation. Cut pipes with milling type cutters or saws. Snap cutters, torch, hammer and chisel cutting methods shall not be used. Chamfer cut ends of pipe per joint manufacturer's written recommendations. Do not cut glass or polyethylene lined pipes.

Do not allow deflection of alignment at joints to exceed permissible deflection as specified below:

PIPE DEFLECTION ALLOWANCES

Maximum permissible deflection, in.*		
Size of pipe, in	Push-on joint	Mechanical joint
4	10	16
6	10	14
8	10	10
10	10	10
12	10	10

*Maximum permissible deflection for 20-ft. lengths; for other lengths in proportion of such lengths to 20ft.

When pipe laying not in progress, close open ends of pipe with temporary watertight plugs. If water in trench, do not remove plug until danger of water entering pipe passed. Provide valves with extension stems where required for operation. Provide extension stems for valves installed underground and elsewhere so that operating wrench does not exceed 6 ft. in length. Provide valve boxes for each buried valve. Set box so top is flush with finished surface and so box does not bear on valve. Install polyethylene encasement by methods A or B as described in Section 4.3 of ANSI/AWWA C105/A21.5.

7. **Trench Backfilling:** Backfill materials, meeting the requirements for Select Fill, shall be placed above the mid diameter of the pipe to twelve (12) inches above the pipe. The Select Fill backfill shall be compacted to a density of at least ninety-two (92) percent of the maximum density as determined by ASTM D1557 (Modified Proctor).

Backfill materials placed from twelve (12) inches above the pipe to the bottom of the roadway base course in paved areas or to the bottom of loam shall meet the requirements for Common backfill. Fill shall be placed and compacted so that a density of at least ninety (90)

ITEM #1301966A, #1301968A
 #1302004A, #1302006A, #1400000A
 #1400003A, #1400004A, #1400051A
 #1401242A, #1401254A, #1401991A
 #1401994A, #1403608A, #1405081A

percent of the maximum density is achieved as determined by ASTM D1557 (Modified Proctor). Select equipment and establish procedures consistent with the backfill materials being used to achieve the required density. Backfill materials with more than fifteen (15) percent passing the No. 200 sieve shall be placed at a moisture content between two (2) percent dry and three (3) percent wet of the optimum moisture content as determined by ASTM D1557.

Puddling or jetting of the backfill materials may be utilized, however, any water used for puddling or jetting shall be secured in sufficient quantity and pressure to obtain the required result and shall be provided at no additional cost to the Owner.

All settlement of trench backfill shall be repaired at no additional cost to the Owner. All repairs shall be made with materials meeting the requirements of the specifications compacted as specified. After trenches have been backfilled as specified, all surplus material shall be removed and legally disposed of at no additional cost to the Owner. The removal of surplus material and clean-up of trench surfaces shall closely follow the pipe laying Work. Where hardened surfaces or roadways, driveways, or walls are disturbed, special attention shall be given to backfilling and compaction prior to resurfacing.

8. **Testing and adjustment:** Conduct hydrostatic testing in conformance with the requirements of Section 5.2 of AWWA C600. Test duration shall be two hours. Test pressure shall be 80 psi. No visible leakage will be allowed and any visible leakage shall be repaired. Contractor shall provide all temporary testing materials and appurtenances required for performing hydrostatic testing, repeatedly if necessary, to achieve satisfactory results. Maintain section full of water for 24 hours before conducting hydrostatic testing. If section fails hydrostatic test, locate, uncover, and repair or replace defective pipe, fitting, or joint, at no additional expense and without time extension. Conduct additional tests and repairs until section passes hydrostatic test.

Adjust valve boxes to finish grade. Demonstrate operation of all valves. Record number of turns required to open or close valve.

Protect completed installation from damage.

Method of Measurement:

“8” Solid Sleeve” shall be measured for payment by the actual number of each fitting installed in accordance with the specifications and as designated on the plans.

“12” Solid Sleeve” shall be measured for payment by the actual number of each fitting installed in accordance with the specifications and as designated on the plans.

“8” Gate Valve” shall be measured for payment by the actual number of each valve and corresponding valve box installed in accordance with the specifications and as designated on the plans.

ITEM #1301966A, #1301968A
#1302004A, #1302006A, #1400000A
#1400003A, #1400004A, #1400051A
#1401242A, #1401254A, #1401991A
#1401994A, #1403608A, #1405081A

“12” Gate Valve” shall be measured for payment by the actual number of each valve and corresponding valve box installed in accordance with the specifications and as designated on the plans.

“Test Pit Excavation (Sanitary Sewer)” shall be measured for payment to the nearest cubic yard volume of each test pit excavated in accordance with the specifications and as designated on the plans.

“Trench Excavation 0’-10’ Deep (Sanitary Sewer)” shall be measured to the nearest cubic yard of soil encountered and removed.

“Rock in Trench Excavation 0’-10’ Deep (Sanitary Sewer)” shall be measured to the nearest cubic yard of soil encountered and removed.

“Dewatering” shall be measured for payment on a lump sum basis. |

“8” Ductile Iron Pipe (Sanitary Sewer)” shall be measured for payment to the nearest number of linear feet of accepted pipe of the type or size installed, measured along the centerline of the pipe through fittings in each continuous section.

“12” Ductile Iron Pipe (Sanitary Sewer)” shall be measured for payment to the nearest number of linear feet of accepted pipe of the type or size installed, measured along the centerline of the pipe through fittings in each continuous section.

“1/2” Crushed Stone Bedding (Sanitary Sewer)” shall be measured to the nearest cubic yard of crushed stone installed in the trench.

“Sand Blanket Cover (Sanitary Sewer)” shall be measured to the nearest cubic yard of sand installed in the trench.

“Removal of Existing Sanitary Sewer” shall be measured to the nearest linear foot of abandoned pipe removed during Stage 2A of construction.

“Granular Fill (Sanitary Sewer)” shall be measured to the nearest cubic yard of granular fill installed in the trench.

Basis of Payment:

“8” Solid Sleeve” will be paid for at the contract unit price per each for the type or designation indicated on the plan or ordered by the Engineer, complete in place. The price shall include all materials including but not limited to fittings, glands, gaskets, bolts, polyethylene encasement, equipment, and tools and labor incidental to the installation.

ITEM #1301966A, #1301968A
#1302004A, #1302006A, #1400000A
#1400003A, #1400004A, #1400051A
#1401242A, #1401254A, #1401991A
#1401994A, #1403608A, #1405081A

“12” Solid Sleeve” will be paid for at the contract unit price per each for the type or designation indicated on the plan or ordered by the Engineer, complete in place. The price shall include all materials including but not limited to fittings, glands, gaskets, bolts, polyethylene encasement, equipment, and tools and labor incidental to the installation.

“8” Gate Valve” will be paid for at the contract unit price per each for the type or designation indicated on the plan or ordered by the Engineer, complete in place. The price shall include all materials including but not limited to valves, valve boxes, glands, gaskets, bolts, polyethylene encasement, equipment, and tools and labor incidental to the installation.

“12” Gate Valve” will be paid for at the contract unit price per each for the type or designation indicated on the plan or ordered by the Engineer, complete in place. The price shall include all materials including but not limited to valves, valve boxes, glands, gaskets, bolts, polyethylene encasement, equipment, and tools and labor incidental to the installation.

“Test Pit Excavation (Sanitary Sewer)” will be paid for at the contract unit price per each cubic yard as indicated on the plan or ordered by the Engineer. The price shall include all materials, equipment, and tools and labor incidental to the excavation and refilling of the test pit.

“Trench Excavation 0’-10’ Deep (Sanitary Sewer)” will be paid for at the contract unit price per each cubic yard as indicated on the plan or ordered by the Engineer. The price shall include all materials, equipment, and tools and labor incidental to the excavation. The price shall also include the cost of disposing of excavated materials; and temporary earth support.

“Rock in Trench Excavation 0’-10’ Deep (Sanitary Sewer)” will be paid for at the contract unit price per each cubic yard as indicated on the plan or ordered by the Engineer. The price shall include all materials, equipment, and tools and labor incidental to the excavation. The price shall also include the cost of furnishing backfill materials and disposing of excavated materials; and temporary earth support.

“Dewatering” will be paid for at the contract lump sum price. The price shall include all materials, equipment, and tools and labor incidental to the excavation. The price shall include wells, well points, pumps, power or fuel, all materials, equipment, and tools and labor as required to keep the work dry and stable.

“8” Ductile Iron Pipe (Sanitary Sewer)” will be paid for at the contract unit price per linear foot of pipe installed as indicated on the plan or ordered by the Engineer. The price shall also include removing and disposing of the present sewer pipes and any appurtenances as needed for construction of the new pipeline (abandoned pipeline in conflict with future utilities to be removed under a separate pay item); furnishing and installing the pipelines complete as shown on plans or as directed, including fittings, bends, joint restraints, anchors, polyethylene encasement, pressure testing taps, polystyrene insulation board, utility identification tape; backfilling trenches with suitable material; grading; pressure testing as specified herein, and all

ITEM #1301966A, #1301968A
#1302004A, #1302006A, #1400000A
#1400003A, #1400004A, #1400051A
#1401242A, #1401254A, #1401991A
#1401994A, #1403608A, #1405081A

incidental work, except as otherwise herein provided for. No claim will be allowed because the number of pipes and joints may be greater than estimated by the Contractor. The price shall also include all material, transportation, labor, and equipment necessary to construct the pipelines in accord with the Contract Drawings, the Specifications and the requirements of the Engineer there under.

“12” Ductile Iron Pipe (Sanitary Sewer)” will be paid for at the contract unit price per linear foot of pipe installed as indicated on the plan or ordered by the Engineer. The price shall also include removing and disposing of the present sewer pipes and any appurtenances as needed; furnishing and installing the pipelines complete as shown on plans or as directed, including fittings, bends, joint restraints, anchors, polyethylene encasement, pressure testing taps, polystyrene insulation board, utility identification tape; backfilling trenches with suitable material; grading; pressure testing as specified herein, and all incidental work, except as otherwise herein provided for. No claim will be allowed because the number of pipes and joints may be greater than estimated by the Contractor. The price shall also include all material, transportation, labor, and equipment necessary to construct the pipelines in accord with the Contract Drawings, the Specifications and the requirements of the Engineer there under.

“1/2” Crushed Stone Bedding (Sanitary Sewer)” will be paid for at the contract unit price per cubic yard for the type or designation indicated on the plan or ordered by the Engineer, complete in place. The price shall include all materials including but not limited to crushed stone, geotextile fabric, equipment, and tools and labor incidental to the installation.

“Sand Blanket Cover (Sanitary Sewer)” will be paid for at the contract unit price per cubic yard for the type or designation indicated on the plan or ordered by the Engineer, complete in place. The price shall include all materials, equipment, and tools and labor incidental to the installation.

“Removal of Sanitary Sewer” will be paid for at the contract unit price per linear foot of pipe removed as indicated on the plan or ordered by the Engineer. The price shall include all materials, equipment, and tools and labor incidental to the removal and disposal, as well as the installation of mechanical joint caps for the existing pipe to remain in place as shown on the Drawings.

“Granular Fill (Sanitary Sewer)” will be paid for at the contract unit price per cubic yard for the type or designation indicated on the plan or ordered by the Engineer, complete in place. The price shall include all materials, equipment, and tools and labor incidental to the installation.

Pay Item	Pay Unit
8” Solid Sleeve	EA
12” Solid Sleeve	EA
8” Gate Valve	EA
12” Gate Valve	EA
Test Pit Excavation (Sanitary Sewer)	CY

ITEM #1301966A, #1301968A
 #1302004A, #1302006A, #1400000A
 #1400003A, #1400004A, #1400051A
 #1401242A, #1401254A, #1401991A
 #1401994A, #1403608A, #1405081A

Trench Excavation 0'-10' Deep (Sanitary Sewer)	CY
Rock in Trench Excavation 0'-10' Deep (Sanitary Sewer)	CY
Dewatering	LS
8" Ductile Iron Pipe (Sanitary Sewer)	LF
12" Ductile Iron Pipe (Sanitary Sewer)	LF
1/2" Crushed Stone Bedding (Sanitary Sewer)	CY
Sand Blanket Cover (Sanitary Sewer)	CY
Removal of Existing Sanitary Sewer	LF
Granular Fill (Sanitary Sewer)	CY

ITEM #1301966A, #1301968A
#1302004A, #1302006A, #1400000A
#1400003A, #1400004A, #1400051A
#1401242A, #1401254A, #1401991A
#1401994A, #1403608A, #1405081A