MDOT P.I.N. 017852.00

SOUTH BERWICK, MAINE

SOUTH BERWICK SEWER DISTRICT

RTE. #236/BERWICK ROAD SANITARY SEWER IMPROVEMENTS

SPECIAL PROVISIONS

OCTOBER 3, 2012

Prepared by:

Civil Consultants
293 Main Street
South Berwick, Maine 03908
Job #11-099.01

RTE. #236/BERWICK ROAD SANITARY SEWER IMPROVEMENTS
INDEX

DIVISION 01 - GENERAL REQUIREMENTS

DIVISION 02 - SITE WORK

SECTION 100 - DESCRIPTION OF WORK

PART 1: GENERAL

100.1 SCOPE

A. The CONTRACTOR shall furnish and install sewer main, man holes, house service connections, and appurtenances, as shown on the drawings and specified herein.

B. The CONTRACTOR shall remove and replace existing sewer mains and services, as shown on the drawings, to accommodate the changes resulting from the street reconstruction.

C. The CONTRACTOR shall perform leakage and pressure tests as specified herein.

100.2 DUTIES OF THE OWNER / SOUTH BERWICK SEWER DISTRICT:

A. The OWNER / SOUTH BERWICK SEWER DISTRICT will locate the terminal points of the work and will also locate any of its facilities lying in close proximity which would in any way be a hazard to the CONTRACTOR'S operations.

B. The OWNER / SOUTH BERWICK SEWER DISTRICT will obtain location permits and all street opening permits from cities, towns or the Maine Department of Transportation. The OWNER will pay any permit charges, or other fees levied by any of these, which are applicable to the work covered by the Contract.

100.3 DUTIES OF THE CONTRACTOR:

A. The CONTRACTOR will familiarize himself with all obstructions which he can foresee, including but not limited to existing pipes, services, conduits, ducts, sewers, wires, cables, utility poles, signs or any other such obstructions which might interfere with the construction, and he agrees to make arrangements with the owners of such facilities so as to save the OWNER / SOUTH BERWICK SEWER DISTRICT harmless from any damages thereto caused by his operations and to make whatever arrangements might be necessary to move or remove and replace these facilities so as to permit the construction, all at his own expense. The CONTRACTOR agrees that there will be no extras charged for this type of work, except by special agreement with the OWNER / SOUTH BERWICK SEWER DISTRICT and upon written order from him.

B. The CONTRACTOR will make any changes which may be required, such as the removing or restoring of the property of others in the land through which this line will cross in right-of-way or otherwise. The CONTRACTOR will place all pipe, fittings and all attendant facilities to proper line and grade, as called for in the

plans and specifications and to the satisfaction of the OWNER / SOUTH BERWICK SEWER DISTRICT.

C. The CONTRACTOR will furnish all fuel, gasoline, oil, etc. for the operation of his equipment, all tools and equipment, and all labor and supervision necessary for the handling of material, for excavation, installation, backfilling and cleaning the site as required. He will dispose of excess spoil and restore the land surface over the entire length of the project. Restoration shall be made to the satisfaction of the OWNER / SOUTH BERWICK SEWER DISTRICT.

D. The CONTRACTOR will perform the pressure and leakage test of the main as described herein in the presence of the OWNER / SOUTH BERWICK SEWER DISTRICT.

E. The CONTRACTOR shall furnish and install sewer mains and fittings, test and connect the new line to the existing SOUTH BERWICK SEWER DISTRICT sewer main with satisfactory, watertight pipelines, laid to proper line and grade in accordance with these contract documents to the satisfaction of the SOUTH BERWICK SEWER DISTRICT.

F. The CONTRACTOR shall coordinate and work concurrently with other contractors, who may be working in the same area, to assure completion in a timely manner.

END OF SECTION

SECTION 103 - CONTROL OF WORK

PART 1: GENERAL

103.1 EQUIPMENT

A. The CONTRACTOR shall utilize equipment which will be efficient, appropriate and large enough to secure a satisfactory quality of work and a rate of progress which will insure the completion of the work within the time stipulated. If at any time such equipment appears to the OWNER / SOUTH BERWICK SEWER DISTRICT to be inefficient, inappropriate or insufficient for securing the quality of work required or for producing the rate of progress aforesaid, he may order the CONTRACTOR to increase the efficiency, change the character or increase the equipment, and the CONTRACTOR shall conform to such order. Failure of the OWNER / SOUTH BERWICK SEWER DISTRICT to give such order shall in no way relieve the CONTRACTOR of his obligations to secure the quality of the work and rate of progress required.

103.2 PIPE LOCATIONS

A. Pipelines shall be located substantially as indicated on the Drawings, but the OWNER / SOUTH BERWICK SEWER DISTRICT reserves the right to make such modifications in locations as may be found desirable to avoid interference with existing structures or for other reasons. Where fittings are noted on the Drawings, such notation is for the CONTRACTOR's convenience and does not relieve him from laying and jointing different or additional items where required.

103.3 CARE AND PROTECTION OF PROPERTY

A. The CONTRACTOR shall be responsible for the preservation of all public and private property, and shall use every precaution necessary to prevent damage thereto. If any direct or indirect damage is done to public or private property by or on account of any act, omission, neglect, or misconduct in the execution of the work on the part of the CONTRACTOR, such property shall be restored by the CONTRACTOR, at his expense, to a condition similar or equal to that existing before the damage was done, or he shall make good the damage in other manner acceptable to the OWNER.

103.4 PROTECTION AND RELOCATION OF EXISTING STRUCTURES AND UTILITIES

A. The CONTRACTOR shall assume full responsibility for the protection of all buildings, structures, and utilities, public or private, including poles, signs, services to buildings, utilities in the street, gas pipes, water pipes, hydrants, sewers, drains, and electric and telephone cables, whether or not they are shown on the Drawings. The CONTRACTOR shall carefully support and protect all such structures and utilities from injury of any kind. Any damage resulting from the CONTRACTOR's operations shall be repaired by him at his expense.

B. Protection and temporary removal and replacement of existing utilities and structures as described in this Section shall be part of the work under the Contract and all costs in connection therewith shall be considered incidental to the bid prices.

103.5 CONTRACTOR'S UTILITIES

A. CONTRACTOR will be responsible for providing his own power, telephone, water and toilet facilities, as needed, during the performance of the Work.

103.6 COOPERATION WITHIN THIS CONTRACT

A. All firms or persons authorized to perform any work under this Contract shall cooperate with General Contactor and his Subcontractors or trades, and shall assist in incorporating the work of other trades where necessary or required.

103.7 HOURS OF WORK

A. Normal hours for the work of this Contract shall be between 7:00 AM and 6:00 PM Monday through Friday. The CONTRACTOR shall request and receive permission from the OWNER / SOUTH BERWICK SEWER DISTRICT for any work scheduled outside of these hours.

END OF SECTION

SECTION 115 - MEASUREMENTS AND PAYMENT

PART 1: GENERAL

115.1 METHOD OF MEASUREMENTS AND BASIS OF PAYMENT:

A. All measurements for payments will be based on completed work performed in strict accordance with the drawings and specifications, and on the contract bidding and payment item schedules. All work completed under the contract will be measured by the DISTRICT'S REPRESENTATIVE according to the methods outlined below. In cases where the payment clause in the specifications relating to any unit or lump sum price stated in the contract requires that the said unit or lump sum price cover and be considered compensation for certain work or material essential to the item, this same item will not be measured or paid for under any other pay item which may appear elsewhere in the specifications.

PART 2: PAYMENT ITEMS:

115.2 ASBESTOS CEMENT PIPE REMOVAL – PAY ITEM #202.1913

A. Method of Measure: linear feet measured along center line of pipe.

B. Basis of Payment: Payment of the unit price established in the Bid shall be full compensation for clearing, excavating, shoring and bracing, dewatering, (Item #202.193) removal of asbestos pipe, backfilling, cleanup and associated work as specified and shown on the Drawings and at locations designated by the DISTRICT'S REPRESENTATIVE.

C. Schedule of payment: removal: 100%.

115.3 DISPOSAL OF SPECIAL WASTE (CONTAMINATED SOIL) – PAY ITEM #203.2317

A. Method of Measure: Actual number of cubic yards disposed of.

B. Basis of Payment: Payment of the unit price established in the Bid shall be full compensation for excavating, removal and disposal, backfilling, cleanup and associated work as specified and shown on the Drawings and at locations designated by the DISTRICT'S REPRESENTATIVE.

C. Schedule of payment: Written evidence of proper disposal; 100%.

115.4 EIGHT INCH (8") PVC SANITARY SEWER PIPE – PAY ITEM #801.17

A. Method of Measurements: Actual linear feet installed.

B. Basis of Payment: Payment of the unit price established in the Bid shall be full compensation for excavation, shoring and bracing, dewatering,(Item No. 801.17)

8” sanitary sewer pipe, backfill, testing, cleanup and associated work as specified and shown on Drawings.

C. Schedule of Payment: Installation – 75%; Testing – 25%.

115.5 SIX INCH (6”) PVC SANITARY SEWER SERVICE LATERALS – PAY ITEM #803.135

A. Method of Measurements: Actual linear feet installed.

B. Basis of Payment: Payment of the unit price established in the Bid shall be full compensation for excavation, shoring and bracing, dewatering,(Item No. 803.135) 6” sanitary sewer pipe, backfill, testing, connecting to existing service (where applicable), cleanup and associated work as specified and shown on Drawings.

C. Schedule of Payment: Installation – 75%; Testing – 25%.

115.6 FOUR FOOT (4’) DIAMTER SEWER MANHOLES – PAY ITEM #812.16

A. Method of Measurements: Actual number installed.

B. Basis of Payment: Payment of the unit price established in the Bid shall be full compensation for excavation, shoring and bracing, dewatering, (Item No. 812.16) 4’ sanitary sewer manholes, backfill, testing, cleanup and associated work as specified and shown on Drawings.

C. Schedule of Payment: Installation – 75%; Testing – 25%.

115.7 ADJUST CAST IRON MANHOLE FRAMES AND COVERS TO GRADE – PAY ITEM # 812.162

A. Method of measure: ACTUAL NUMBER ADJUSTED.

B. Basis of Payment: Payment of the unit price established in the Bid shall be full compensation for excavating, (Item No. 812.162) adjusting, backfilling, cleanup and associated work as specified and shown on the Drawings and at locations designated by the DISTRICT’S REPRESENTATIVE.

C. Schedule of pavement: Adjustment: 100%.

115.8 REBUILD EXISTING SANITARY MANHOLES – PAY ITEM #812.164

A. Method of Measure: Actual number rebuilt.

B. Basis of Payment: Payment of the unit price established in the Bid shall be full compensation for excavating, (Item No. 812.164) rebuilding, backfilling, cleanup and associated work as specified and shown on the Drawings and at locations designated by the DISTRICT’S REPRESENTATIVE.

C. Schedule of payment: Rebuild; 100%.

END OF SECTION

SECTION 131 - SUBMITTALS

PART 1: GENERAL

131.1 SUBMITTALS FOR SOUTH BERWICK SEWER DISTRICT APPROVAL

A. For all products to be incorporated into the Work submit to the OWNER / SOUTH BERWICK SEWER DISTRICT for approval sufficient information in the form of shop drawings, product data and/or samples such that the OWNER / SOUTH BERWICK SEWER DISTRICT can determine that the product is in compliance with the technical specifications and drawings.

B. Submit two (2) copies of each submittal. One (1) copy will be returned to the CONTRACTOR. Each copy shall include a cover sheet that clearly identifies the product and corresponding specification section. Each cover sheet shall bear the CONTRACTOR'S stamp and signature certifying that the submittal is in full compliance with the Contract Documents or that any deviations from the Contract Documents are clearly identified on a separate sheet(s) labeled "Deviations From Contract Documents" and attached to the cover sheet.

C. OWNER / SOUTH BERWICK SEWER DISTRICT Review: The OWNER / SOUTH BERWICK SEWER DISTRICT shall review the submittals and indicate their status as:
    1. NO EXCEPTION TAKEN.
    2. FURNISH AS CORRECTED.
    3. REVISE AND RESUBMIT.
    4. REJECTED.

D. OWNER / SOUTH BERWICK SEWER DISTRICT review is only for general conformance with the design concept and general conformance with the information given in the Contract Documents. Corrections or comments made during the review do not relieve the CONTRACTOR from compliance with the requirements of the Contract Documents.

E. Re-submittals: Make re-submittals under procedures specified for submittals; identify changes made since previous submittal.

F. CONTRACTOR shall be responsible for the delays and/or additional expenses that result from the CONTRACTOR'S failure to submit a complete submittal and/or to identify portions of the submittal that does not conform to the specifications.

END OF SECTION

SECTION 172 - PROJECT RECORD DOCUMENTS

PART 1: GENERAL

172.1 SCOPE:

A. The CONTRACTOR shall keep records of changes to the drawings and specifications as outlined below.

PART 2: PRODUCTS

172.2 SECURE AND RECORD DOCUMENTS:

A. Throughout the progress of construction, the CONTRACTOR shall keep a set of current, detailed field record drawings indicating deviations from the contract drawings, shop drawings, and/or installation drawings, and exact location of concealed work, including underground utilities. This requirement does not authorize any deviations without acceptance of the DISTRICT'S REPRESENTATIVE.

B. The field record information shall be marked in a legible manner on prints of accepted shop drawings and/or installation drawings furnished by the CONTRACTOR or, where such drawings do not apply, on two sets of prints of the contract drawings furnished by the OWNER / SOUTH BERWICK SEWER DISTRICT. The field information to be so marked shall include:

1. Deviations of any nature made during construction
2. Location of underground mechanical and electrical services, utilities, and appurtenances, referenced to permanent surface improvements and/or marker posts.

C. Upon completion of the work, the field record information marked on prints of accepted shop drawings and/or installation drawings together with the marked prints of the contract drawings shall be delivered by the CONTRACTOR to the OWNER / SOUTH BERWICK SEWER DISTRICT.

PART 3: EXECUTION

172.3 METHODS:

A. Keep project record documents current. Do not permanently conceal any work until the required information has been recorded.

B. Use marking pens for showing changes.

172.4 SUBMITTALS:

A. Submit project record documents prior to request for final payment.

END OF SECTION

SECTION 202 REMOVAL OF UNDERGROUND ASBESTOS CEMENT PIPE

SECTION 202.

PART 1: GENERAL

202.1 SCOPE:

A. All precautions shall be taken to avoid exposing the existing asbestos cement water main.

B. This section includes the removal, transport and disposal of asbestos cement pipe.

202.2 GENERAL APPLICABILTY OF CODES. REGULATIONS AND STANDARDS:

A. All applicable federal, state and municipal codes, regulations, and standards have the same force and effect (and are made part of the contract documents by reference) as if copied directly into the contract documents, or as if published copies are bound herewith.

202.3 GENERAL REGULATIONS OF MAINE D.E.P. CHAPTER 425 – ASBETOS MANAGEMENT RULES:

A. Regulations apply to any work that impacts greater than 3 square feet or 3 linear feet of asbestos.

B. Requires D.E.P. notification prior to removal of asbestos.

C. Companies performing the removal must be licensed by the D.E.P.

D. Engineering controls such as double polyethylene containment, wet methods and encapsulant application are basic requirements.

202.4 EXEMPTION TO RULES OF CHAPTER 425:

A. The Contractor is not subject to the rules outlined in paragraph 1.3 if the following is met: The removal and containerization (appropriately covering in a dump truck) of intact asbestos cement pipe provided they are not sanded, grinded, abraded or cut with a mechanical cutter. Each section of pipe removed must be removed using best management practices such that a minimum amount of breakage occurs during the initial removal of each length of pipe. For example, best management practices does allow the contractor to cut the pipe away at the manhole connections and allows inadvertent breakage while pulling apart the pipe at the joint. The pipe must remain intact throughout the remainder of the removal, containerization and transport process.

B. Should the Contractor fail to adhere to best management practices, the contractor will be responsible for complying with all regulations associated with Chapter

425. The Contractor will also be responsible for any fines levied by D.E.P. for non compliance of the exemption.

202.5 COMPLIANCE WITH STATE AND FEDERAL REGULATIONS:

A. Federal OSHA and Construction Standards apply to all removal and containerization. Containerization requirements include placing asbestos waste in leak proof containers.

B. The transportation of asbestos-containing materials is governed by Maine's Non-Hazardous Waste Transporters Licenses, 06-096 CMR 411.

C. The disposal of asbestos-containing material in Maine is governed by Maine's Landfill Siting, Design and Operation Rule, 06-096 CMR 410. The Contractor is required to transport the asbestos waste to an approved licensed landfill.

202.6 SUBMITTALS:

A. Plan of action: Submit a plan detailing the removal and transport process in order to comply with the exemption to Maine D.E.P. Chapter 425 – Asbestos Management Rules.

B. Provide name, location and copies of applicable licenses of the landfill for disposal of asbestos containing or asbestos contaminated waste.

C. Within 30 days of receipt of asbestos waste at the approved landfill, the Contractor shall submit to the Owner the original Waste Shipment Record acknowledging disposal of all associated waste material (pipe) from the Contract showing delivery date, quantity, and appropriate signature of Contractor (transporter) and landfill's authorized representative.

	PAY ITEM	PAY UNIT
202.1913	Asbestos Cement Pipe Removal	Linear Foot

END OF SECTION

SECTION 801. 8" POLYVINYL CHLORIDE (PVC) SEWER PIPE

PART 1: GENERAL

801.1 DESCRIPTION:

A. This work shall consist of providing and installing PVC non-pressure pipe and fittings of the size(s) and type(s) and in the location(s) shown on the Drawings and as specified herein. The related work specified elsewhere includes; Excavation and backfill, dewatering, pavement, borrow and bedding material.

PART 2: MATERIALS

801.2 MANUFACTURERS. ACCEPTABLE MANUFACTURERS INCLUDE:

A. Certain-Teed.

B. J-M Manufacturing.

C. Or equivalent.

801.3 DELIVERY STORAGE AND HANDLING.

A. Provide all labor necessary to assist the Engineer to inspect pipe, fittings, gaskets and other materials. Carefully inspect all materials at the time of delivery and just prior to installation. Carefully inspect all pipe and fittings for:

1. Defects and damage.

2. Deviations beyond allowable tolerances for joint dimensions.

3. Removal of debris and foreign matter.

B. Examine area and structures to receive piping for:

1. Defects, such as weak structural components that adversely affect the execution and quality of work.

2. Deviations beyond allowable tolerance for pipe clearances.

C. All materials and methods not meeting the requirements of the Contract Documents will be rejected. Immediately remove all rejected materials from the project site.

801.4 PIPE AND FITTINGS.

A. The polyvinyl chloride pipe and fittings, including those required for stubs, shall conform to ASTM standard specification for PVC Sewer Pipe and Fittings, Designation D 3034 (SDR 35) (8"*).* Straight pipe shall be furnished in lengths of

not more than 13 feet with standard laying length shall be 12.5 feet. Saddles will not be allowed.

B. Pipe Laying

1. Pipes shall be laid in a prepared trench with bedding as indicated on the plans. Bedding for sanitary sewer pipes shall extend up to the top of pipe. Care shall be taken to ensure equal bearing under the entire length of the pipe.

2. Laying of pipe shall start at a manhole and/or the lowest point on the grade and proceed up stream. Bells shall be facing upstream. Adjoining sections of pipe shall form a continuous and smooth invert.

3. Firmly support the pipe and fittings on bedding material as shown on the Drawings and as specified in the appropriate Sections of these Specifications. Do not permanently support the pipe or fittings on saddles, blocking stones, or any material which does not provide firm and uniform bearing along the outside length of the pipe. Thoroughly compact the material under the pipe to obtain a substantial unyielding bed hand-shaped to fully support the pipe.

4. Excavate suitable holes for the joints so that only the barrel of the pipe receives bearing pressure from the supporting material after placement. Lay each pipe length so it forms a close joint with the adjoining length and bring the inverts to the required grade. Adjoining sections of pipe shall form a smooth and continuous invert.

5. Pipes shall be laid true to the invert lines and grades shown on Drawings or as directed by the Owner and shall be laid on a continuous grade. Correct dips and offsets. A variation of 1/8 inch or more from true invert grade and 1/4 inch or more on sewers laid on grades above one percent will be deemed sufficient reason to cause the work to be rejected. Work so rejected shall be corrected by the Contractor at his own expense in a manner acceptable to the Owner.

6. The Contractor shall demonstrate his proposed methods of maintaining the grade and alignment of pipe during construction with the Owner prior to start of construction. Methods that will be acceptable for consideration are, but not limited to, the following:

    a. Use of a transit
    b. Laser beam, utilizing the equipment manufacturers recommended procedure for sewer construction.

7. Do not drive the pipe down to grade by striking it with a shovel handle, timber, rammer, or any other unyielding object. When each pipe length has been properly set, place and compact enough of the bedding material between the pipe and the sides of the trench to hold the pipe in correct alignment. After

filling the sides of the trench, place and lightly tamp bedding material to complete the bedding as shown on the Drawings.

8. Take all necessary precautions to prevent floatation of the pipe in the trench. When pipe laying is not in progress, close the open ends of the pipe with temporary watertight plugs. If water is in the trench when work is resumed, do not remove the plug until all danger of water entering the pipe is eliminated. Do not use the pipelines as conductors for trench drainage during construction.

9. Cut or furnish short lengths of pipe at manholes or appurtenances so that pipe entering and leaving manholes measures between 1.2 and 1.9 feet from the inside face of the manhole.

801.5 JOINTS.

A. Joints for the polyvinyl chloride pipe shall be push-on joints using factory installed elastomeric ring gaskets. The gaskets shall be securely fixed into place by the manufacturer so that they cannot be dislodged during joint assembly. The gaskets shall be of a Composition and texture which is resistant to common ingredients of sewage and industrial wastes, including oils and ground water, and which will endure permanently under the conditions of the proposed use. The joints shall conform to ASTM Specifications for Joints for Drain and Sewer Plastic Pipes using Flexible Elastomeric Seals, Designation D3212-76 and F477.

PART 3: CONSTRUCTION REQUIREMENTS

801.6 INSPECTION.

A. Each pipe unit shall be inspected before being installed. No single piece of pipe shall be laid unless it is generally straight. The centerline of the pipe shall not deviate from a straight line drawn between the centers of the openings at the ends of the pipe by more than 1/16 inch per foot of length. If a piece of pipe fails to meet this requirement for straightness, it shall be rejected and removed from the site. Any pipe unit or fitting discovered to be defective either before or after installation shall be removed and replaced with a sound unit.

801.7 JOINTING.

A. All pipe and fittings shall be cleared of all debris, dirt, etc., before being installed and shall be kept clean until accepted in the completed work. Pipe and fittings shall be installed to the lines and grades indicated on the drawings or as required by the Engineer. Care shall be taken to insure true alignments and gradients. All joint surfaces shall be cleaned. Immediately before jointing the pipe, the bell or groove shall be lubricated in accordance with the manufacturer's recommendation. Each pipe unit shall then be carefully pushed into place without damage to pipe or gasket. Suitable devices shall be used to force the pipe units

together so that they will fit with a minimum open recess inside and outside and have tightly sealed joints. Care shall be taken not to use such force as to wedge apart and split the bell or groove ends. - Joints shall not be “pulled” or “cramped” unless permitted by the Engineer.

801.8 TESTING.

A. Final sewer testing work includes the performance of testing and inspecting each and every length of sewer pipe, pipe joints and each item of appurtenant construction. Perform testing at a time acceptable to the Engineer, which may be during the construction operations, after completion of a substantial and convenient section of the work, or after the completion of all pipe laying operations. Provide all labor, pumps, pipe, connections, gages, measuring devices and all other necessary apparatus to conduct tests.

B. All sewers, manholes, and appurtenant work, in order to be eligible for acceptance by the Engineer, shall be subjected to tests that will determine the degree of watertightness and horizontal and vertical alignment.

1. Thoroughly clean and/or flush all sewer lines to be tested, in a manner and to the extent acceptable to the Engineer, prior to initiating test procedures. Perform all tests and inspections in the presence of the Engineer and the plumbing or building inspector in accordance with the requirements of the local and state plumbing codes.

2. Perform testing by test patterns determined by or acceptable to the Engineer. If remedial work is necessary:

C. Perform all work necessary to correct deficiencies discovered as a result of testing and/or inspections.

D. Completely retest all portions of the original construction on which remedial work has been performed.

E. Perform all remedial work and retesting in a manner and at a time acceptable to the Engineer at no additional cost to the Owner.

801.9 LINE ACCEPTANCE TESTS – (Gravity sewers and service connections).

A. Test all gravity sewer lines and service connections for leakage by conducting a low pressure air test.

B. Equipment:

1. Pneumatic plugs shall have a sealing length equal to or greater than the diameter of the pipe to be inspected.

2. Pneumatic plugs shall resist internal test pressures without requiring external bracing or blocking.

3. AU air used shall pass through a single central panel.

4. Connect 3 individual hoses:

    a. From the control panel to the pneumatic plugs for inflation,
    b. From the control panel to the sealed sewer line for introducing the low pressure air,
    c. From the sealed sewer line to the control panel for continually monitoring the air pressure rise in the sealed line.

C. Testing Pneumatic Plugs:

1. Seal test all pneumatic plugs prior to using them in the actual test.

2. Lay one length of pipe on the ground and seal both ends with the pneumatic plugs to be tested.

3. Pressurize the sealed pipe to *5* psig.

4. The pneumatic plugs are acceptable if they remain in place without bracing.

D. Testing Sewer Pipeline:

1. After the sewer pipe has been cleaned and the pneumatic plugs checked, place the plugs in the sewer line at each manhole and inflate them.

2. Introduce low pressure air into the sealed sewer pipeline until the air pressure reaches 4 psig greater than the average groundwater pressure.

3. Allow a minimum of 2 minutes for the air pressure to stabilize to a minimum of 3.5 psig greater than the groundwater pressure. Groundwater is assumed to be at ground surface unless the Contractor can prove by otherwise by test pitting.

4. After -the stabilization period, disconnect the air hose from the control panel to the air supply.

5. The pipeline will be acceptable if the pressure decrease is not greater than 1/2 psig in the time stated in the following table for the length of pipe being tested:

Time (Mm.) for Length of Pipe

Pipe Diameter (inches)	0-100 ft	101-200 ft	201-300 ft	301-400 ft
4	2.0	2.0	2.0	2.0
6	3.0	3.0	3.0	3.0
8	4.0	4.0	4.0	5.0
10	5.0	5.0	6.0	8.0
12	5.5	5.5	8.5	11.5

E. Test Results:

1. If the installation fails the low pressure air test, determine the source of leakage.

2. Repair or replace all defective materials and/or workmanship and repeat low pressure air test at no additional cost to the Owner.

801.10 ALIGNMENT TESTS (Gravity Sewers).

A. Perform tests for the correctness of horizontal and vertical alignment on each and every length of gravity sewer pipeline between manholes, prior to the installation of the service leads.

B. Alignment tests to be conducted after all pipe has been installed and back.filled.

C. The observation test shall be conducted after all upstream work has been completed and the pipeline cleaned of debris.

D. Notify the Engineer at least 24 hours in advance of the proposed observation testing.

E. Introduce water into the sewer lines to be tested from the upstream manhole prior to the observation test but no more than 24-hours in advance of the test.

F. Beam a source of light, acceptable to the Engineer, through the pipeline from both ends and the Engineer will directly observe the light in the downstream, and/or upstream manhole of each test section.

G. The length of pipe between manholes, diameter of pipe and amount of light observed in the manhole at the end of each pipe section will determine acceptance of the alignment test by the Engineer.

H. The amount of vertical and horizontal deflection shall not be greater than the ASTM allowance and (manufacturer's recommendations) for the pipe being tested.

I. No standing water shall be allowed. The presence of standing water shall be cause

for rejection of that pipe (including manhole) section.

J. Improper alignment will be corrected by re-excavation and resetting of pipe at no additional cost to the Owner.

801.11 PIPE DEFLECTION: (Gravity Sewers).

A. Maximum Allowable Deflection: 3 percent of the pipe diameter if tested 0 to 2 months after installation and 5 percent of the pipe diameter if tested more than 2 months after installation. Such deflection shall be computed by multiplying the amount of deflection (normal diameter less minimum diameter when measured) by 100 and dividing by the nominal diameter of the pipe.

B. The Contractor shall wait a minimum of 30 days after completion of a section of sewer, including placement and compaction of backfill, before measuring the amount of deflection by pulling a specially designed gage assembly through the completed section. The gage assembly shall be in accordance with the recommendations of the pipe manufacturer and be acceptable to the Engineer.

C. Should the installed pipe fail to meet this requirement, the Contractor shall do all work to correct the problem as the Engineer may require without additional compensation.

801.12 INSPECTION OF APPURTENANT INSTALLATIONS.

A. Completely inspect, at a time determined by the Engineer, all manholes and inlets to ascertain their compliance with the Drawings and Specifications.

B. Provide access to each manhole and inlet and check the following characteristics:

1. Shape and finish of invert channels,

2. Watertightness and finish of masonry structures,

3. Location, type, and attachment of stops,

4. Elevation and attachment of frames, covers, and openings,

5. Pattern and machining of covers, and

6. Drop connection arrangements.

801.13 MANHOLE LEAKAGE TESTING.

A. Manhole Leakage Testing is specified in the “Precast Sewer Manhole” Section 812.

801.14 METHOD OF MEASUREMENT.

A. Gravity sewer pipe measured for payment shall be the number of linear feet installed measured along the center line of the pipe as laid including fittings. Pipes shall be measured between centers of the manholes minus half the inside diameter of each manhole. Pipe installed into the manhole will not be measured for payment.

801.15 BASIS OF PAYMENT.

A. The contract unit price per linear foot for gravity sewer pipe shall be full compensation for all labor, materials, and equipment necessary to complete this work including excavation, removal and disposal of existing sewer, dewatering, bedding, furnishing and installing pipe (including tees), making connections to new and existing manholes, backfill, compaction, maintaining the trench per requirements of MDOT during construction until pavement is placed, cleaning, testing, handling existing flows during construction of new facilities, plugging of existing sewers where indicated, and all else incidental thereto for which payment is not provided under other items.

B. Payment for this work on interim requisitions shall be according to the following percentages:

1. Gravity sewer pipe in place and back filled -90 percent

2. Gravity sewer pipe successfully cleaned and tested - 10 percent.

Payment will be made under:

Pay Item	Pay Unit
801.17 8” PVC Sanitary Sewer Pipe (SDR 35)	Linear Foot

END OF SECTION

SECTION 803 - SIX INCH (6") POLYVINYL CHLORIDE (PVC) SERVICE LEADS

803.1 DESCRIPTION.

A. This work shall consist of providing and installing PVC non-pressure sewer service pipe and fittings of the size(s) and type(s) and in the location(s) shown on the Drawings and as specified herein. The related work specified elsewhere includes; Excavation and backfill, dewatering, pavement, borrow and bedding material.

PART 2 MATERIALS

803.2 MANUFACTURERS. ACCEPTABLE MANUFACTURERS INCLUDE:

A. Certain-Teed.

B. J-M Manufacturing

C. Or equivalent.

803.3 DELIVERY STORAGE AND HANDLING.

A. Provide all labor necessary to assist the Engineer to inspect pipe, fittings, gaskets and other materials. Carefully inspect all materials at the time of delivery and just prior to installation. Carefully inspect all pipe and fittings for:

1. Defects and damage.

2. Deviations beyond allowable tolerances for joint dimensions.

3. Removal of debris and foreign matter.

B. Examine area and structures to receive piping for:

1. Defects, such as weak structural components that adversely affect the execution and quality of work.

2. Deviations beyond allowable tolerance for pipe clearances.

3. All materials and methods not meeting the requirements of the Contract Documents will be rejected. Immediately remove all rejected materials from the project site.

803.4 PIPE AND FITTINGS.

A. The polyvinyl chloride pipe and fittings, including those required for stubs, shall conform to ASTM standard specification for PVC Sewer Pipe and Fittings, Designation D 3034 (SDR *35)* (4" to *15").* Straight pipe shall be furnished in

lengths of not more than 13 feet. Saddles will not be allowed.

803.5 JOINTS.

A. Joints for the polyvinyl chloride pipe shall be push-on joints using factory installed elastomeric ring gaskets. The gaskets shall be securely fixed into place by the. manufacturer so that they cannot be dislodged during joint assembly. The gaskets shall be of a composition and texture which is resistant to common ingredients of sewage and industrial wastes, including oils and ground water, and which will endure permanently under the conditions ‘of the proposed use. The joints shall conform to ASTM Specifications for Joints for Drain and Sewer Plastic Pipes using Flexible Elastomeric Seals, Designation D3212-76.

803.6 INSPECTION.

A. Each pipe unit shall be inspected before being installed. No single piece of pipe shall be laid unless it is generally straight. The centerline of the pipe shall not deviate from a straight line drawn between the centers of the openings at the ends of the pipe by more than 1/16 inch per foot of length. If a piece of pipe fails to meet this requirement for straightness it shall be rejected and removed from the site. Any pipe unit or fitting discovered to be defective either before or after installation shall be removed and replaced with a sound unit.

803.7 JOINTING.

A. All pipe and fittings shall be cleared of all debris, dirt, etc., before being installed and shall be kept clean until accepted in the completed work. Pipe and fittings shall be installed to the lines and grades indicated on the drawings or as required by the Engineer. Care shall be taken to insure true alignments -and gradients. All joint surfaces shall be cleaned. Immediately before jointing the pipe, the bell or groove shall be lubricated in accordance with the manufacturer’s recommendation. Each pipe unit shall than be carefully pushed into place without damage to pipe or gasket. Suitable devices shall be used to force the pipe units together so that they will fit with a minimum open recess inside and outside and have tightly sealed joints. Care shall be taken not to use such force as to wedge apart and split the bell or groove ends. Joints shall not be “pulled” or “cramped” unless permitted by the Engineer.

803.8 LINE ACCEPTANCE TESTS (PVC SERVICE LEADS) – Refer to these Sections 801.08 & 801.10.

803.9 METHOD OF MEASUREMENT.

A. Service leads measured for payment shall be the number of linear feet installed measured along the center line of the pipe as laid from the sewer main to the connection to the existing service connection

803.10 BASIS OF PAYMENT.

A. The contract unit price per linear foot for service leads shall be full compensation for all labor, materials, and equipment necessary to complete this work including excavation, removal and disposal of existing sewer service pipe, dewatering, bedding, furnishing and installing pipe (including couplings), backfill, compaction, maintaining the trench per requirements of MDOT during construction until pavement is placed, locating and reconnect existing services where applicable, handling existing flows during construction of new facilities and all else incidental thereto for which payment is not-provided under other items.

Payment will be made under:

Pay Item	Pay Unit
803.135 6" PVC Sanitary Sewer Pipe (SDR 35)Service Lateral	Linear Foot

END OF SECTION

SECTION 812 - PRECAST SEWER MANHOLES

812.01 DESCRIPTION.

A. This work shall consist of constructing manholes, covers, frames, brick masonry, inverts and the application of waterproofing in conformance with the dimensions, elevations, and locations shown on the Drawings and as specified herein. Also included is removal and disposal of existing manholes where indicated on the drawings.

PART 2: MATERIALS

A. Precast Manhole Base, Barrel and lop Sections:

1. Conform to ASTM C478-84 except as modified herein, and on the Drawings.

2. Average strength of 4,000 psi at 28 days.

3. Testing:
   a. Determine concrete strength by tests on 6-inch by 12-inch vibrated test cylinders cured in the same manner as the bases, barrels and tops.
   b. Have tests conducted at the manufacturer's plant or at a testing laboratory approved by the Engineer.
   c. Have not less than 2 tests made for each 100 vertical feet of precast manhole sections.

B. Manhole Steps - shall comply with ASTMD246 TPEII Grade 16906 and ASTM C478.

1. Acceptable Manufacturers:
   a. Aluminum Company of America.
   b. Reliance Steel Products, Inc.
   c. M.A. Industries, Inc.
   d. Or equivalent.

C. Frames and Covers - shall comply with ASTM A-48 .
1. Acceptable Manufacturers:
   a. NEENAH Foundary, #R17556
   b. LeBaron Foundary #LBW 308.
   c. Or equivalent.

D. Masonry:

1. Brick: - shall comply with the ASTM Standard Specifications for Sewer Brick (made from clay or shale), Designation C32, for Grade SS, hard brick.

2. Cement: ASTM C-15O.

3. Hydrated Lime: ASTM C-207.

4. Sand: ASTM C144.

E. Waterproofing - shall comply with ASTM 1187 Type I and ASTM D1227, Type III.

1. Acceptable Manufacturers:
   a. Minwax Fibrous Brush Coat, Minwax Co., N.Y., N.Y.
   b. Tremco 121 Foundation Coating, Tremco Mfg. Co., Newark, N.J.
   c. Or approved equal.

F. Joint Sealant

1. Conform to ASTM M198B and C990-91

2. Acceptable Manufacturers:
   a. Kent Seal
   b. Ram Neck
   c. Or approved equal.

812.02 PRECAST MANHOLE SECTIONS

A. Dimensions, shall be as shown on the Drawings:

1. Base & Riser Sections:
   a. Diameter: 1.22m (48")
   b. Length: As required.
   c. Wall Thickness: Not less than 5 inches.
   d. Joints: Bell-and-spigot or tongue-and-groove formed on machine rings to insure accurate joint surfaces.

2. Tops:
   a. Diameter: Eccentric cone type, 24 inches diameter clear opening at top, 48 inches I.D. at bottom unless otherwise shown on the Drawings.
   b. Length: 4 feet.
   c. Wall Thickness: Not less than 5 inches at the base, tapering to not less than 8 inches at the top.
   d. Joints: Bell-and-spigot or tongue-and-groove formed -on machine rings to insure accurate joint surfaces.
   e. Exterior face of cone sections shall not flare out beyond the vertical.

3. Flat Slab Tops:
   a. Location: Where shallow installations do not permit the use of a cone-type top and where indicated on the Drawings.
   b. Clear Opening of 24": diameter.
   c. Slab thickness: Not less than 6 inches.

d. Constructed to support an HS-20 wheel loading.

B. Openings:

1. Provide openings in the risers to receive pipes entering the manhole.

2. Make openings at the manufacturing plant.

3. Size: To provide a uniform annular space between the outside wall of pipe and riser.

4. Location: To permit setting of the entering pipes at the correct elevations.

5. Openings shall have a flexible watertight union between pipe and the manhole base.
   a. Cast into the manhole base and sized to the type of pipe being used.
   b. Type of flexible joint being used shall be approved by the Engineer.
   c. Install materials according to the Manufacturer's instructions.

1. Lock Joint Flexible Manhole Sleeve made by Interpace Corporation.

2. Kor N Seal made by National Pollution Control System, Inc.

3. Press Wedge II made by Press-Seal Gasket Corporation.

4. A-Lok Manhole Pipe Seal made by A-Loc Corporation.

5. Or equivalent.

C. Joints:

1. Joint gaskets to be flexible self seating butyl rubber joint sealant installed according to manufacturer's recommendations. For cold weather applications, use adhesive with joint sealant as recommended by manufacturer.

2. Acceptable Materials:
   a. Kent-Seal No. 2.
   b. Ram-Nek.
   c. Or equivalent.

3. Joints between precast sections shall conform to related standards and manufacturer's instructions.

D. Waterproofing:

1. The exterior surface of all manholes shall be given two coats of bituminous waterproofing material at a application rate of 75 to 100 square feet per gallon, per coat.

2. The coating shall be applied after the manholes have cured adequately and can be applied by brush or spray in accordance with the manufacturer's written instruction.

3. Sufficient time shall be allowed between coats to permit sufficient drying so that the application of the second coat has no effect on the first coat.

812.03 FRAMES AND COVERS

1. Shall provide a clear opening of 24" and have the word "SEWER" cast 3" high.

2. Acceptable Manufacturers:
   a. NEENAH Foundry Type, R-1575.
   b. LeBaron Foundry type LBW 308.
   c. Or approved equal.

812.04 MANHOLE STEPS

A. Polyethylene coated steel safety type designed with a minimum concentrated live load of 300 pounds.

B. Thoroughly clean all surfaces to be embedded with a suitable cleaning agent to ensure that the surfaces are free from all foreign matter such as dirt, oil and grease.

C. Aluminum surfaces to be embedded shall be given a protective coating of an approved heavy-bodied bituminous material. The steps shall become thoroughly dry before being placed into the concrete.

D. All steps shall be cast into walls of the precast section so as to form a continuous ladder with a distance of 12-inches between steps.

812.05 MASONRY

A. Brick:

1. Sound, hard, uniformly burned, regular and uniform in shape and size, compact texture, and satisfactory to the Engineer.

2. Immediately remove rejected brick from the work.

B. Mortar:

1. Composition (by volume):
   a. 1 part Portland cement.
   b. 1/2 part hydrated lime.
   c. 4 ½ parts sand.

2. The proportion of cement to lime may vary from 1:1/4 for hard brick to 1:3/4 for softer brick, but in no case shall the volume of sand exceed 3 times the sum of the volume of cement and lime.

C. Cement shall be Type II Portland cement.

D. Hydrated lime shall be Type S.

E. Sand:

1. Shall consist of inert natural sand.

2. Grading:

3/8-inch	100
No.4	95-100
No. 8	80-100
No. 16	50~85
No. 50	10-30
No. 100	2-10
Fineness Modulus	2.3 - 3.1

PART 3 - CONSTRUCTION REQUIREMENT

812.06 PRECAST MANHOLE SECTIONS.

A. Perform jointing in accordance with manufacturer's recommendations and as approved by the Engineer. Install riser sections and tops level and plumb. Make all joints watertight. When necessary, cut openings carefully to prevent damage to barrel sections and tops. Solidly fill annular spaces around pipes entering the manholes with non-shrink grout or sealant approved by the Engineer. Replace damaged manhole sections and tops at no additional cost to the Owner. When manhole steps are included in the Work, install barrel sections and tops so that

812.07 DROP MANHOLES.

A. The difference in elevation between the invert of the inlet pipe to the invert of the outlet pipe shall not exceed 24 inches without use of a drop structure. Where difference in elevation exceeds 24 inches, construct a drop manhole as shown on the Drawings or as directed by the Engineer.

812.08 ADJUST TO GRADE.

A. Adjust tops of manholes to grade with brick masonry. Concrete rings are not acceptable for adjusting to grade.

812.09 PIPE CONNECTIONS TO MANHOLES.

A. Connect pipes to manholes with joint design and materials approved by the Engineer.

812.10 INVERT CHANNELS.

A. Smooth and semicircular in shape conforming to the inside of the adjacent sewer section. Make changes in direction of flow with smooth curves having a radius as large as permitted by the size of the manhole. Stop the pipes at the inside face of the manhole where changes of direction occur. Form invert channels with brick. Shape invert to make smooth transition in vertical grade. Slope the floor of the manhole to the flow channel, as shown on the Drawings.

812.11 MASONRY.

A. When laying brick, use only clean bricks in brickwork for manholes. Moisten the brick by suitable means until they are neither so dry as to absorb water from the mortar nor so wet as to be slippery when laid. Lay each brick in a full bed and joint of mortar without requiring subsequent grouting, flushing, or filling, and thoroughly bond as directed. Construct all joints in a neat workmanlike manner. Construct the brick surfaces inside the manholes so they are smooth with no mortar extending beyond the bricks and no voids in the joints. Maximum mortar joints shall be 1/2 inch. Outside faces of brick masonry shall be plastered with mortar from V4-inch to 3/8-inch thick. Completed brickwork shall be watertight.

B. When curing masonry, protect brick masonry from drying too rapidly by using burlaps which are kept moist, or by other approved means. Protect brick masonry from the weather and frost as required.

812.12 FRAMES AND COVERS.

A. Set all frames in a full bed of mortar, true to grade and concentric with the manhole opening. Completely fill all voids beneath the bottom flange to make a watertight fit. Place a ring of mortar at least- one inch thick around the outside of the bottom flange, extending to the outer edge of the manhole all around its circumference. Clean the frame seats before setting the covers in place.

812.13 PLUGGING AND PATCHING.

A. Fill all exterior cavities with non-shrink grout and with bituminous waterproofing once the concrete and mortar has set. Touch up damaged water proofing.

812.14 CLEANING.

A. Thoroughly clean manholes, steps, frames and covers of all debris and foreign matter.

812.15 BEDDING AND BACKFILLING.

A. Bedding of manholes shall be 6 inches of 3/4" screened stone. Backfill a minimum of 18 inches all around manhole with gravel borrow.

812.16 MANHOLE TESTING – VACUUM LEAKEAGE TESTS (Preferred Method)

A. General:
   1. To be observed by the Owner representative on each manhole.
   2. A vacuum test made as described below. Manhole to pipe connection must be a flexible connector to perform this testing.

B. Preparation for Test:

   1. After the manhole has been assembled in place, fill lifting holes and point with an approved non-shrinking grout.

   2. Perform test prior to placing the shelf and invert and before filling and pointing the horizontal joints, and before backfilling.

   3. If the groundwater table has been allowed to rise above the bottom of the manhole, lower for the duration of the test.

   4. Plug pipes and other openings into the manhole and brace plugs to prevent blow out.

C. Test Procedure:

   1. Test immediately after manhole assembly.

   2. Use manhole vacuum test equipment equal to NPC systems, Inc., Milford, New Hampshire.

   3. Set tester in place.

   4. Inflate compression band to seal to structure.

   5. Draw a vacuum of 10-inch Hg.

   6. Close the valve.

   7. Acceptable test:
      a. Less than 1 inch Hg drop in 3 minutes for a manhole less than 10 feet in depth.
      b. Less than 1 inch Hg drop in 5 minutes for a manhole 10 feet to 20 feet in depth.

   8. If leakage occurs, fill joints with non-shrink grout, allow to set and retest.

9. Rejected Manholes: Disassemble, construct or replace a directed by the Owner.

812.17 MANHOLE TESTING- EXFILTRATION LEAKAGE TESTS (When Vacuum Test Not Possible):

A. General:

1. To be observed by the Owner on each manhole.

2. An exfiltration test made as descried below.

B. Preparation for Test:

1. After the manhole has been assembled in place, fill lifting holes and point with an approved non-shrinking grout.

2. Perform test prior to placing the shelf and invert and before filling and pointing the horizontal joints.

3. If the groundwater table has been allowed to rise above the bottom of the manhole, lower for the duration of the test.

4. Plug pipes and other openings into the manhole and brace plugs to prevent blow out.

C. Test Procedure:

1. Fill manhole with water to the top of the cone section.

2. If the excavation has not been back filled and observation indicates no visible leakage, that is, no water visibly moving down the surface of the manhole, the manhole may be considered to be satisfactorily watertight.

3. f the test as described above is unsatisfactory as determined by the Owner or if the manhole excavation has been back filled, continue the test.

4. A period of time may be permitted to allow for absorption.

5. At the end of this period, refill the manhole to the top of the cone, if necessary, and measure water level for at least 8 hours.

6. At the end of the test period, refill to the top of the cone, measuring the volume of water added.

7. Extrapolate to a 24-hour rate and determine leakage on the basis of depth.

8. Not exceed 1 gallon per vertical foot for a 24 -hour period.

9. If the test fails this requirement, but the leakage does not exceed 3 gallons per vertical foot per day, repair by approved methods as directed by the Owner to bring the leakage within the allowable rate.

10. Leakage due to a defective section or joint or exceeding the 3 gallon per vertical foot per day, shall be cause for the rejection of the manhole.

11. Rejected Manholes: Uncover the manhole as necessary and disassemble, reconstruct or replace as directed by the Owner.

12. Retest and, if satisfactory, fill and point all inferior joints and those exterior joints within 6 feet of the surface.

13. Conduct either before or after back filling around manhole.

14. However, if back filling is done prior to testing, for any reason, it shall be at his own risk and it shall be at his own risk and it shall be incumbent upon the contractor to determine

15. No adjustment in the leakage allowance will be made for unknown causes such as leaking plugs, absorption, etc., i.e., it will be assumed that all loss of water during the test is a result of leaks through the joints or through the concrete.

16. Take any steps necessary to assure the Owner that the water table is below the bottom of the manhole throughout the test.

812.18 INFILTRATION TEST:

A. If the groundwater table is above the highest joint in the manhole, and if there is no leakage into the manhole as determined by the Owner, use to evaluate the water tightness of the manhole.

B. However, if the Owner is not satisfied, lower the water table and carry out the test as described hereinbefore.

812.19 MANHOLE REPAIRS.

A. Correct leakage by reconstruction, replacement of gaskets and/or other methods as approved by the Engineer. The use of lead-wool or expanding mortar will not be permitted. After the manholes have been backfilled and prior to final acceptance, any signs of leaks or weeping visible inside the manholes shall be repaired and the manhole made watertight.

812.20 METHOD OF MEASUREMENT:

A. New sanitary manholes accepted for payment shall be measured as one unit and paid for under item #812.16, installed and accepted complete in place.

B. Existing sanitary manhole covers to be adjusted to grade will be measured as one unit each and paid under Pay Item 812.162. Existing sanitary manholes where new sewers will be connected will have new pipe connections cored, flexible boots pressed in and inverts modified accordingly, will be measured as one unit each and paid under Pay Item 812.164.

812.21 BASIS OF PAYMENT:

A. The contract unit prices of new 4' Diameter Precast Sanitary Manhole, Rebuild Sewer Manhole and Adjusting Manhole or Catch Basin to Grade shall be full compensation for all labor, materials, tools and equipment necessary to complete this work including excavation, (except ledge excavation), removal and disposal of existing sewer manholes, bedding, constructing inverts, backfill, compaction, furnishing and installing precast sections, waterproofing and testing, frames, covers, concrete and masonry materials, drop structures and associated drop assembly and piping, and all else incidental thereto for which payment is not provided under other items.

Payment will be made under:

Pay Item	Pay Unit
812.16 Sewer Manhole (includes inverts, Frames & Covers)	Each
812.162 Adjust Existing Manhole Frame & Cover to Grade	Each
812.164 Rebuild Existing Sewer Manhole Invert, Core Pipe Opening, & Install Flexible Pipe Boot	Each

END OF SECTION

J:\aaa\2011\1109901\SPECS\20121003_SEWERSPECS.doc