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MP-1 **SCOPE**

This section covers methods of measurement and payment for items of work under this contract.

MP-2 **GENERAL**

The total bid price for each section of the contract shall cover all work required by the Contract Documents. All costs in connection with the proper and successful completion of the work including furnishing all materials, equipment, supplies, appurtenances and performing all necessary labor and supervision to fully complete the work, shall be included in the unit and lump sum prices bid. All work not specifically set forth as a pay item in the Bid Form shall be considered as incidental and all costs in connection therewith shall be included in the unit price(s) bid per linear foot of main line sewer.

MP-3 **ESTIMATED QUANTITIES**

All Estimated Quantities stipulated in the Bid Form or other Contract Documents are approximate and are to be used only as a basis for estimating the probable cost of the work and for the purpose of comparing the bids submitted for the work. The actual amounts of work done and materials furnished under unit price items may differ from the estimated quantities. The basis of payment for work and materials will be the actual amount of work done and materials furnished. The CONTRACTOR agrees that he will make no claim for damages, anticipated profits, or otherwise on account of any difference between the amounts of work actually performed and materials actually furnished and the estimated amounts thereof.

MP-4 **MEASUREMENT DEFINITIONS**

MP-4.01 **Trench Excavation**

The width of excavation, including rock excavation, to be used in the determination of pay quantities shall be as described below, unless additional width is authorized by the DISTRICT.

All pay items associated with trench widths shall be calculated based upon a maximum allowable trench width of 4 (four) feet, or the Nominal Pipe Diameter plus 2 (two) feet, whichever is greater; except where:

- (a) CONTRACTOR has excavated a trench of less width than these limits, in which case the actual nominal trench width shall be used, or
- (b) This has been otherwise directed or approved by the ENGINEER.

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Trench excavation at manholes shall be based on a square measuring six feet plus nominal manhole inside diameter, unless additional excavation is authorized by the DISTRICT.

MP-4.02.1 Sanitary Sewer Installation

The unit prices for sewer pipe and related appurtenances shall include the following work, and no separate payment for these items will be made:

- (a) Site Preparation (including clearing and grubbing)
- (b) Removal and Storage of Topsoil
- (c) By-Pass Pumping
- (d) Common Excavation and Trench Backfilling and Compaction
- (e) Sheet piling, Shoring and Bracing
- (f) Dewatering Excavated Areas
- (g) Waste Material Disposal
- (h) Air, Mandrel and Vacuum Testing
- (i) Restoration of Surface (including structures, landscaping, etc.)
- (j) Seeding and Mulching
- (k) Connection of Existing Sewer Main or Service to new Manhole
- (l) Pipe embedment material (PVC- to springline, DIP - per detail)
- (m) Replacement of pavement markings with like material
- (n) Renewing traffic signal underpavement wiring
- (o) Removal of existing sewer line
- (p) Removal and disposal of pavement
- (q) Verification of size and location of existing underground utilities
- (r) Pre-blast and post blast survey
- (s) Traffic control in accordance with the requirements of NCDOT and the Manual on Uniform Traffic Control Devices.

MP-4.02.2 Trenchless Sewer Liner Installation

The unit prices for Fold and Formed PVC and Cured-In-Place pipe shall include the following work, and no separate payment for these items will be made:

- (a) Site Preparation (including clearing and grubbing of approved areas)
- (b) By-Pass Pumping
- (c) Verification of existing sewer size and ability to rehabilitate using the specified method
- (d) Pre-Construction television inspection of sewer main lines including an inspection of all service laterals connecting to main line; Laterals shall be inspected to existing clean-outs or 10 horizontal linear feet where the main is in easement areas or to street right-of-way where main is within the street right-of-way.
- (e) Post-Construction video inspection of main lines.

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- (f) Applicable Testing
- (g) Restoration of surfaces damaged during installation including grassing.

MP-5

WORK ITEMS

MP-5.01 Mobilization

All work covered by this section will be paid for at the contract lump sum price for "Mobilization". The lump sum bid price shall not exceed 3% of the total project bid.

Partial payments for the item of "Mobilization" will be made with the first and second partial pay estimates paid on the contract, and will be made at the rate of 50% of the lump sum price for "Mobilization" on each of these partial pay estimates.

MP-5.02 Sanitary Sewer Line Installation

Method of Measurement

The quantity of Sanitary Sewer Pipe to be paid for will be the actual number of linear feet of sanitary sewer line by pipe type which has been properly incorporated into the completed and accepted work. Pipe length shall be measured by actual linear feet in place measured along the pipe center line with no deduction for wyes or tees. **Horizontal measurements through manholes shall be excluded.** Depth of cut shall be measured from original ground surface to pipe invert.

Basis of Payment

The quantity of Sanitary Sewer line will be paid for at the contract unit price for each type and size of pipe as shown in the Bid Schedule. Price and payment shall constitute full compensation for furnishing all equipment, tools, labor and materials to complete the work as specified, including site preparation, trench excavation, placement and compaction of backfill, landscaping, and all related items for complete installation. The stone embedment material is to be included in the price of the sewerline itself, including stone to the springline of PVC Pipe.

MP-5.03 Manhole Installation

Method of Measurement

The quantity of Manholes to be paid for will be the actual number of manholes, including frame and cover, complete with all appurtenances,

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installed and accepted. Manholes will be counted according to manhole type, either "Standard" or "Drop". Manholes with multiple drop connections shall be counted as one (1) drop manhole in the Bid Schedule. Additional compensation may be provided for manholes which exceed 6 feet in depth (invert out to top of cover).

Basis of Payment

The quantity of Manholes will be paid for at the contract unit price for each manhole, complete including but not limited to all foundation preparation, installation, backfill and compaction, concrete, pipe connections, boots, construction of invert, installation of frame and cover, landscaping and all related construction to complete the work as specified.

MP-5.04 Additional Manhole Depth

Method of Measurement

Additional manhole depth shall be measured when the manhole depth exceeds 6 feet, based on the elevation difference between "Invert Out" and the top of cover. Measurement shall be by the vertical foot, to the nearest 0.1 foot, for all depth exceeding 6 feet.

Basis of Payment

The quantity of Additional Manhole Depth will be paid for at the contract unit price per vertical foot. Price and payment shall constitute full compensation for all work covered by this section, including furnishing all equipment, labor, and materials to complete the work.

MP-5.06 Clean-out Assembly

Method of Measurement

The quantity of Clean-out Assemblies to be paid for shall be the actual number of clean-out assemblies, by size, complete with all appurtenances, installed and accepted, per the MSD Detail.

Basis of Payment

The quantity of Clean-out Assemblies shall be paid for at the contract unit price for each size clean-out assembly installed, complete but not limited to excavation, preparation, installation, backfill, compaction, and all related construction, and shall include the sanitary service wye, vertical section of pipe and fittings, hub and cap, cast iron box, and reconnection of existing service or plug (whichever is applicable). See MSD Detail.

MP-5.09 Replace Manhole Frame & Cover

Method of Measurement

The quantity of manhole frames and covers paid shall be the actual number of manhole frames and covers that are replaced and accepted. The frames and covers shall meet DISTRICT's standard specifications for materials and installation of manhole frame and covers.

Basis of Payment

The quantity of frame and covers shall be paid for at the contract unit price for Replacement of Manhole Frame and Cover. Manholes to have the frame and cover replaced are indicated on the Plans. Said work shall include the removal and disposal of the existing frame and cover, and the installation, including any vertical adjustment, of a new frame and cover per DISTRICT standards.

MP-5.12 Pipe Foundation Material

Method of Measurement

The quantity of Pipe Foundation Material to be paid for shall be the actual amount of material, by cubic yards, to the nearest 1/10 cubic yard, which has been properly placed, compacted and incorporated into the completed and accepted work, as approved by ENGINEER. Length shall be determined by the ENGINEER; Width shall be as described in Section **MP-4.01** "Trench Excavation"; Depth shall be as approved by the ENGINEER or as shown on the Detail Sheets.

Basis of Payment

The quantity of Pipe Foundation Material shall be paid for at the contract unit price per cubic yard installed, complete including but not limited to hauling, placing, compaction, and other related construction.

MP-5.13 Compacted Aggregate Base Course

Method of Measurement

The quantity of compacted aggregate base course to be paid for shall be the actual cubic yardage, to the nearest 1/10 cubic yard, which has been properly placed, compacted, and incorporated into the completed and accepted work.

For new construction, the quantities shall be computed from the allowable

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width and required thickness as shown on the plans and the actual horizontal length measured in place. For replacement, the quantities shall be computed from the approved trench width, the required thickness, and the actual horizontal length measured in place.

Basis of Payment

The quantity of compacted aggregate base course shall be paid for at the contract unit price per cubic yard installed, complete including but not limited to hauling, subgrade compaction, placing, compaction, shaping, and other related construction.

MP-5.14 Select Backfill Material

Method of Measurement

The quantity of Select Backfill Material to be paid for shall be the actual cubic yards, to the nearest 1/10 cubic yard of approved select backfill material which has been properly incorporated, as per plans and specifications into the completed and accepted work. When existing trench materials are unsuitable for use as backfill material, or cannot be dewatered to an acceptable material on site, the ENGINEER will authorize payment for "Select Backfill Material". When authorized in writing by the ENGINEER, select backfill materials will be measured for payment. Basis of depth shall be as requested by the ENGINEER. Trench width shall be measured as described in Section **MP-4.01** "Trench Excavation".

Basis of Payment

The quantity of Select Backfill Material shall be paid for at the contract unit price for each cubic yard, complete including but not limited to providing select backfill material, including all excavation, hauling, furnishing, placing and compacting of backfill material, and all other related construction.

MP-5.19 Gravel Surface Repair

Method of Measurement

The quantity of Gravel Surface Repair to be paid for shall be the actual cubic yardage, by stone size and type, to the nearest 1/10 cubic yard, which has been properly placed, compacted, and incorporated into the completed and accepted work.

For new construction, the quantities shall be computed from the allowable width and required thickness as shown on the plans and the actual horizontal

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length measured in place. For replacement, the quantities shall be computed from the approved trench width, the required thickness, and the actual horizontal length measured in place. Trench width shall be measured as described in Section **MP- 4.01** "Trench Excavation".

Gravel Surfaces requiring repair/replacement as a result of equipment travel, material storage, or other actions by the CONTRACTOR outside the allowable trench widths shall not be included in the gravel surface repair pay item, and shall be repaired/replaced at the CONTRACTOR's expense.

Basis of Payment

The quantity of Gravel Surface Repair shall be paid for at the contract unit price per cubic yard installed, complete including but not limited to hauling, subgrade compaction, placing, compaction, shaping, and other related construction.

MP-5.21 Bituminous Pavement Repair and Resurfacing

Method of Measurement

The quantity of Bituminous Pavement Repair, and Bituminous Pavement Resurfacing, (as applicable) to be paid for shall be the square yards of surface area, to the nearest 1/10 square yard. The quantities for repair shall be computed based on the allowable trench width of 4 feet, unless additional width is authorized by the ENGINEER, and the actual horizontal length measured in place. The quantities for resurfacing shall be computed based on existing road widths and required taper as applicable.

Where pavement, driveways, or other asphalt surfacing of whatever nature have been removed by the CONTRACTOR beyond the limits called for in the Plans and Specifications or as set by the ENGINEER, or have been damaged through negligence or carelessness of the CONTRACTOR's forces, they shall be replaced in accordance with these specifications at the CONTRACTOR's expense.

Basis of Payment

The quantity of Bituminous Pavement Repair, and Bituminous Pavement Resurfacing shall be paid for at the contract unit price per square yard at the depth as specified on Plans. The contract price shall be full compensation for Bituminous Pavement Repair and Bituminous Pavement Resurfacing complete, including but not limited to pavement cutting, binder, hauling, tack coat, spreading, compaction, and all related construction.

MP-5.24 Concrete Curb and Gutter Replacement

Method of Measurement

The quantity of concrete curb and gutter to be paid for shall be the number of linear feet properly installed and accepted.

Basis of Payment

The quantity of concrete curb & gutter shall be paid for at the contract unit price per linear foot installed complete, including but not limited to installation, excavation, form work, backfill, compaction, restoration of surfaces and all related items as required.

MP-5.25 Hand Placed Asphalt Curb

Method of Measurement

The quantity of Hand Placed Asphalt Curb to be paid for shall be the actual number of linear feet installed as measured along the centerline of the curb top, and accepted into the completed Work .

Basis of Payment

Payment for Hand Placed Asphalt Curb will be paid for at the contract unit price per linear foot including but not limited to all labor, traffic control, materials, preparation, asphalt hauling, placing and finishing work, complete to the satisfaction of the ENGINEER.

MP-5.26 Sidewalk Replacement

Method of Measurement

The quantity of sidewalk replacement to be paid for shall be the number of square yards properly installed and accepted.

Basis of Payment

The quantity of concrete sidewalk replacement shall be paid for at the contract unit price per square yard installed complete, including but not limited to installation, excavation, form work, backfill, compaction, restoration of surfaces and all related items as required.

MP-5.30 Replacement of Existing Property Monument Disturbed by Construction

Method of Measurement

The quantity of replacement of existing property monument disturbed by construction shall be per each. See Technical Specifications Item X, paragraph 10.03 for further definition.

Basis of Payment

The quantity of “property monuments” to be paid for shall be paid for at the contract unit price per each property monument disturbed by construction. See Technical Specifications Item X, paragraph 10.03 for further definition.

MP-6.01 Trenchless Sewer Line Installation

Method of Measurement

The quantity of trenchless sewer liner installation to be paid for shall be the actual number of linear feet of sanitary sewer line by pipe type which has been properly incorporated into the completed and accepted work. Pipe length shall be measured by actual linear feet in place measured along the pipe centerline. Payment shall be made from centerline to centerline of manhole(s).

Basis of Payment

The quantity of trenchless sewer line installation shall be paid for at the contract unit price for each type and size of pipe as shown in the Bid Schedule. Price and payment shall constitute full compensation for furnishing all equipment, tools, labor and materials to complete the work as specified, including site preparation, installation of the pipe and related items to complete installation, including all items listed in Section MP-4.2.

MP-6.03 Service Reconnection By Remote Cut Method

Method of Measurement

The quantity of service lateral reconnections per remote cut method shall be measured by the number of approved reconnections performed by remote cut unless it is determined that additional saddle work is required to repair the lateral. If a new saddle is required to either reconnect or repair the lateral, the reconnection will be considered a reconnection by excavation regardless of whether the main liner is cut remotely from the inside or from

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the outside of the pipe. If a new saddle is not required for the lateral, the reconnection will be considered “service reconnection per remote cut method.”

Basis of Payment

The number of lateral reconnections by remote cut will be paid at the contract price for “service reconnection per remote cut method.” The CONTRACTOR will be responsible for locating all service laterals by television inspection of the lines prior to installation of the liner pipe. This bid item shall include all remote cuts regardless of the size of the existing sewer main or the size of the lateral being reconnected. Only one reconnection will be paid per each service lateral.

MP-6.04 Service Reconnection by Excavation

Method of Measurement

The quantity of service reconnections by excavation shall be the actual number of successful reconnections by excavation due to the inability by the CONTRACTOR to reconnect the service laterals from the pipe interior due to deficiencies in the existing pipe or lateral. Service reconnections by excavation being performed due to poor quality, workmanship, or approval rating of the remote cut are not included in this pay item, and must be reconnected by excavation at no cost to the DISTRICT. Service reconnections by excavation will also be required where a lateral is replaced or where a point repair is made for a defective plumber’s tap.

Basis of Payment

The number of service reconnections by excavation shall be paid at the contract unit price for “Service Reconnection by Excavation”. The CONTRACTOR will be responsible for locating all service laterals by television inspection of the lines prior to installation of the liner pipe. Once the liner pipe has been installed, the CONTRACTOR is responsible to maintain service to all DISTRICT customers. If the CONTRACTOR is unable to reconnect the services by remote cut due to deficiencies in the existing pipe or lateral, the services shall be reconnected immediately by excavation, and will be paid under this line item. Reconnection for each service will be for either reconnection by remote cut or excavation, but not both.

Paving and trench construction associated with service reconnection shall be done in accordance with the specifications and standard details for new construction. Select backfill for point repairs (if required) will be included in the Select Backfill bid item. Paving costs associated with point repairs shall be paid for under the contract unit price for that bid item.

MP-6.05 Point Repair to Existing Line

Method of Measurement

The quantity to be paid for pipe point repair shall be a minimum of 5 linear feet and any additional number of linear feet of sewer line by pipe size that have been properly completed and incorporated into the accepted work.

Basis of Payment

All work associated with a point repair to an existing line shall be included in the contract unit price for the appropriate line size. The pipe replacement material shall be as specified or approved by ENGINEER. Payment for point repair shall include site preparation, trench excavation, trench rock excavation, removal of existing pipe, installation of replacement pipe, tie-ins and sleeves to existing pipes or manholes, boots, repair of invert, placement and compaction of backfill, restoration of landscaping, and all applicable items listed in Section MP-4.2 "Sanitary Sewer Pipe and Lateral Installation". The pipe embedment material (if required) shall be included in the linear foot price for point repairs.

Paving and trench construction associated with point repairs shall be done in accordance with the specifications and standard details for new construction. Select backfill for point repairs (if required) will be included in the Select Backfill bid item. Paving costs associated with point repairs shall be paid for under the contract unit price for that bid item.

MP-6.08 Manhole Liner Rehabilitation

Method of Measurement

The quantity of spray-on liners to existing manholes to be paid shall be the actual vertical footage of the manhole, based on the elevation difference between the top of bench and top of cover. Measurement will be by the vertical foot, to the nearest 0.1 foot for all depths of manholes. Associated manhole invert construction work shall be included in the bid price for this item. Inverts shall be re-built according to DISTRICT Specifications and details for new inverts.

Basis of Payment

The quantity of manhole liner shall be paid for at the contract unit price per vertical foot as shown in the bid schedule. Price and payment shall constitute full compensation for all work covered by this section, including furnishing all equipment, labor, and materials to complete the work, including manhole surface preparation, stoppage of infiltration,

construction of inverts to DISTRICT standards, and application of the liner material.

MP-6.09 Manhole Frame and Cover Replacement

Method of Measurement

The quantity of manhole frames and covers to be replaced shall be the actual number of frames and covers that are installed and accepted with all appurtenances.

Basis of Payment

The quantity of manhole frames and covers to be replaced shall be paid for at the contract unit price for frame and cover replacement, complete but not limited to excavation necessary to remove the existing frame and cover, sawcutting pavement removal and disposal of the existing frame and cover, brickwork repair, installation, backfill, compaction, and all related appurtenances to complete the work as specified.

MP-6.10 Manhole Inside Drop Bowl System (existing manhole)

Method of Measurement

The quantity to be paid shall be the actual number of manhole inside drop bowl systems, per each size, installed and accepted in existing manholes.

Basis of Payment

The quantity of manhole inside drop bowl systems shall be paid at the unit price for each manhole inside drop bowl systems installed for the respective drop pipe size. The unit price shall include all components including tee, drop pipe, bends, pipe support brackets, bowls, and miscellaneous installation hardware.

MP-6.11 Removal of Existing Obstruction in Sewer Line or Lateral

Method of Measurement

The quantity of obstructions that are removed from existing lines or laterals paid for shall be the actual number of obstructions removed by excavation that are authorized by the ENGINEER. Removal by excavation shall only be done when the obstruction cannot otherwise be removed by conventional means. Payment will not be made for any obstructions in the lines caused by the CONTRACTOR such as video equipment, construction operations, or other related obstructions.

Basis of Payment

The number of obstruction removals shall be paid at the contract unit price for each removal of an obstruction that was not caused by the CONTRACTOR, regardless of the amount of excavation required to remove the obstruction. The unit price for each excavation shall include but not be limited to excavation, traffic control, removal of the obstruction, necessary pipe replacement, backfill, compaction and appropriate surface restoration as approved by the ENGINEER. Surface restoration that involves select backfill, asphalt replacement, or asphalt pavement resurfacing will be paid for under the contract unit price for that bid item. Only one such payment will be paid for each lateral unless otherwise approved by the ENGINEER.

MP-6.12 Removal of Protruding Service in Sewer Line

Method of Measurement

The quantity of protruding services removed from the line shall be the actual number previously approved by the ENGINEER and then successfully removed. Protruding services will be required to be removed in order to allow the television camera to pass during the pre-construction video. Removal of protruding services for reasons other than passage of television camera shall be included in the price of lining.

Basis of Payment

The number of protruding services to be removed shall be paid at the contract unit price for “Removal of Protruding Services in Sewer Line”. The CONTRACTOR will be responsible for locating all protruding service laterals by television inspection of the lines prior to installation of the liner pipe. The number of successful protruding service removals will be paid at the contract unit price regardless of the size or depth of the existing sewer main, the size of the protruding lateral being removed, or the material of the protruding lateral being removed. Surface restoration that involves select backfill, asphalt replacement, or asphalt pavement resurfacing will be paid for under the contract unit price for that bid item.

MP-6.13 Improvements to Existing Manhole

Method of Measurement

The quantity of existing manholes to be improved shall be the actual number of structures, complete with all specified improvements, installed and accepted. The removal and disposal of the existing components shall be included in the unit price per Improvement to Existing Manhole.

Basis of Payment

The quantity of structures to be improved shall be paid for at the contract unit price for each improved manhole, complete, including but not limited to all installation, grouting, invert reconstruction, bench repairs, removal and disposal of existing steps and other components, installation of vents (if applicable), landscaping, vacuum testing, and all related construction to complete the work as specified.