

SECTION 01 12 50  
MEASUREMENT AND PAYMENT

**PART 1 GENERAL**

**1.01 DESCRIPTION**

- A. Measurements of the completed work shall be in accordance with, and by instruments and devices calibrated to United States Standard Measures and the units of measurement for payment, and the limits thereof, shall be made as shown on the Plans, Specifications and General Specifications.
- B. Each item for which payment will be made is listed in the Bid Schedule. Work specified or shown on the Drawings for which the Bid Schedule does not provide a separate lump sum or unit price, or which is incidental, is not separately paid. Costs for such work are compensated in the prices bid for other work items.
- C. The Bid Amounts for each Bid Item will be used for comparative bid analysis. The Bid amounts will also form the basis of monthly progress payments. Bid items are not intended to be exclusive descriptions of work categories and the Contractor shall determine and include in its pricing all materials, labor, and equipment necessary to complete each Bid Item (work phase) as shown and specified.

**1.02 METHODS OF MEASUREMENT**

- A. Measure quantities in accordance with standard industry practice, and as specified herein.
- B. Units of measurement are indicated on the Bid Schedule for each unit price item of work. Payment shall be made by multiplying the quantities measured by the unit price bid for the item of work. The costs for performing each item of work shall be included in the price bid for the item in which the work is required.
- C. Payments for lump sum items will be made in accordance with a well-balanced, detailed apportionment of the lump sum, prepared by the Contractor and approved by the Engineer.
- D. Measurements of allowance-based items shall be on the basis of allowable documented costs, as specified herein, for labor, equipment, materials and services, and subcontracts as submitted by the Contractor in the form of time-cards, and invoices.

**1.03 REJECTED, EXCESS, AND WASTED MATERIAL**

- A. The following quantities will not be included for payment:
  - 1. Quantities of material wasted or disposed of in a manner not called for under the Contract or as a consequence of the construction method used to perform the work.
  - 2. Rejected loads of material, including material rejected after it has been placed by reasons of the failure of the Contractor to comply with the provisions of the Contract.
  - 3. Material not unloaded from the transporting vehicle.

4. Material placed outside the lines indicated on the Drawings or established by the Engineer.
5. Material not incorporated into the final Work.
6. Material remaining on hand after completion of the Work.

#### **1.04 MOBILIZATION AND DEMOBILIZATION**

##### **A. MEASUREMENT**

1. Measurement for this item shall be based on satisfactory progress of mobilization and demobilization of the general contractor and any subcontractors.

##### **B. PAYMENT**

1. Payment for mobilization and demobilization will be made at the lump sum price named. This price shall constitute full payment for mobilization and demobilization, complete as specified. The lump sum price for mobilization and demobilization shall include all costs for obtaining all bonds, permits, and licenses; location and procurement of a staging area/storage yard; moving onto and off of the site of all equipment; furnishing and erecting construction facilities; cleanup; and all preparatory work as required for the proper performance and completion of the project, including all work items not identified in a separate bid item. The Total Price for mobilization and demobilization shall not exceed 5 percent of the total bid price and payment of 66% of this line item shall be made for mobilization and 34% for demobilization.

#### **1.05 CLEARING AND GRUBBING**

- A. No separate payment shall be made for clearing and grubbing. The costs for such work shall be included in other bid items.

#### **1.06 CLEAN-UP AND TESTING**

- A. No separate payment shall be made for clean-up and testing, the costs of which shall be included in the item to which it pertains.

#### **1.07 EROSION, SEDIMENTATION AND DUST CONTROL**

##### **A. MEASUREMENT**

1. Measurement for this item will be based on the percentage of work necessary to implement temporary and permanent erosion and sedimentation control measures.

##### **B. PAYMENT**

1. Payment will be made at the lump sum price submitted on the Bid Schedule. Payment shall be full compensation for all labor, materials, and equipment required to implement and maintain erosion and sedimentation control measures as specified and on the drawings. This bid price shall constitute full payment for such measures including, but not limited to, grassing, silt fencing, rip rap, stone check dams, sediment tubes, watering for dust control and other measures stipulated.

## **1.08 TRENCH EXCAVATION AND BACKFILL**

- A. No separate payment shall be made for trench excavation and backfill, the costs of which shall be included in the bid item to which it pertains. No separate payment shall be made for any unique method or technique required for the Contractor to complete the work in accordance with the Contract Documents or federal, state and local regulations, permits, laws and requirements.
- B. No separate payment shall be made for trench sheeting, shoring and bracing, the costs of which shall be included in the bid item to which it pertains. No additional compensation shall be made for completion of all planning, design, engineering fees as well as furnishing, constructing, removal, and disposal of such temporary and/or permanent sheeting, shoring, and bracing as required under the provisions of any permits, laws, regulations and in accordance with the requirements of OSHA.
- C. No separate payment will be made for bedding, initial backfill and subsequent backfill. No separate payment will be made for the trench foundation prepared as indicated in Section 31 23 00 and on the Drawings, except for trench stabilization. The costs for bedding, foundation, initial backfill and subsequent backfill shall be included in the item bid for the associated pipeline.

## **1.09 ROCK EXCAVATION**

### **A. MEASUREMENT**

- 1. Open-cut hard rock for the open trench portion of the sewer installation work shall include, but not be limited to excavation, removal and disposal of rock as defined in Section 31 23 16, replacement with imported backfill and bedding material to replace the volume of hard rock excavated, and all labor, equipment, materials and incidentals required for the work.
- 2. The top of the trench shall be the ground elevation as determined by the Engineer prior to excavation. The grades of the invert of the pipe shall be as show on the drawings. In computing the amount of rock excavation, the depth of the trench shall be 6 inches below the invert of the pipe, while maintaining 12 inches from the sides of the pipe. The measurement for rock excavation shall be the in-place volume of rock measured within the trench limits shown on the drawings. Quantity of work under this bid item may vary. No adjustments to the unit price will be made regardless of the actual quantity. The Engineer shall be given reasonable notice to measure all rock.

### **B. PAYMENT**

- 1. Payment for rock excavation will be made for the quantities determined above, measured in cubic yards to the nearest whole number, at the unit price indicated in the Bid Schedule. The bid price shall be full compensation for excavation, disposal of rock, backfilling, and providing borrow for any deficiency of trench backfill, and all work incidental thereto for which payments not provided under other items. No distinction shall be made for method of rock excavation (i.e. blasting, mechanical removal, etc.)

## **1.10 GRAVITY SANITARY SEWER MAIN**

### **A. MEASUREMENT**

1. Gravity sewer mains shall be measured in linear feet to the nearest whole number, along a horizontal plane, at the depth of cut indicated on the Bid Schedule. The horizontal distance shall be measured from centerline of manhole to centerline of manhole. The depth of cut shall be measured from the existing ground level to the pipe invert at the pipe centerline. The Contractor shall prepare cut sheets, approved by the Engineer, from which the basis of payment will be made.

### **B. PAYMENT**

1. Payment for gravity sewer mains shall be made for each linear foot, for the size, material and depth of cut indicated on the Bid Schedule. No separate payment shall be made for cutting and beveling pipe, maintaining existing sewer flows, surveying and preparing cut sheets, and protecting existing utilities.
2. The Contractor is responsible for locating and marking existing utilities prior to construction. Where horizontal conflicts are encountered in the construction of the gravity sewer, payment shall only be made for additional lengths of sewer main and manholes authorized by the Engineer to avoid the conflict. Where authorized by the Engineer, payment for additional depths will be made to avoid vertical conflicts. No additional payment will be made for any delay or extra cost encountered by the Contractor for the location, protection, avoidance or relocation of existing utilities, mains or services.

## **1.11 PRE-CAST CONCRETE MANHOLE BASE**

### **A. MEASUREMENT**

1. The Bid item for manhole base includes the work necessary to install a new manhole base section, at the diameter indicated, along with the boots, inverts, frame and covers, and connecting the sewer pipes to the manhole. A manhole base includes the first 6 vertical feet of the manhole, measured from the outgoing invert. The measurement of payment for manhole base will be based on the number of each manhole bases installed.

### **B. PAYMENT**

1. Payment for pre-cast concrete manhole base will be made for each number installed at the unit price indicated in the Bid Schedule, for the specified size pre-cast manhole base. Additional depth in the form of a manhole riser will be paid for separately.

## **1.12 PRE-CAST CONCRETE MANHOLE BASE OVER EXISTING SEWER**

### **A. MEASUREMENT**

1. The Bid item for pre-cast concrete manhole base over existing sewer includes the work necessary to install a new manhole base section over an existing sanitary sewer main. The work includes installing the manhole, at the diameter indicated, along with the boots, inverts, frame and covers, and connecting the sewer pipes to the manhole. A manhole base includes the first 6 vertical feet of the manhole, measured from the outgoing invert. The measurement of payment will be based on the number of each manhole bases installed over an existing sewer.

**B. PAYMENT**

1. Payment for pre-cast concrete manhole base over existing sewer will be made for each number installed at the unit price indicated in the Bid, for the specified size pre-cast manhole base. Additional depth in the form of a manhole riser will be paid for separately.

**1.13 PRE-CAST CONCRETE MANHOLE RISER**

**A. MEASUREMENT**

1. The bid item for manhole riser includes the additional manhole sections, beyond the initial 6 vertical feet included in the Manhole Base bid item, required to bring the manhole to the grade needed. Measurement, in vertical feet to the nearest one-tenth, shall be made from the top of the manhole base to the top of the frame and cover.

**B. PAYMENT**

1. Payment for pre-cast concrete riser will be made for each vertical foot at the price indicated in the Bid Schedule.

**1.14 BYPASS PUMPING**

**A. MEASUREMENT**

1. Bypass pumping includes all labor, equipment and materials needed to divert sewer flows around the sewer facilities being replaced, demolished, rehabilitated or connected to. The work shall include providing and maintaining pumps, piping, plugs, etc. necessary for bypass pumping. Measurement for bypass pumping shall be on lump sum basis in accordance with a well-balanced detailed apportionment of the work.

**B. PAYMENT**

1. Payment for bypass pumping shall be made at the lump sum price indicated on the Bid Schedule.

**1.15 PLUG AND GROUT EXISTING PIPE CONNECTION**

**A. MEASUREMENT**

1. The bid item for plug and grout existing pipe connection includes all labor, equipment, and materials needed to plug an abandoned sewer line and rework the manhole bench and invert as indicated in the Drawings. Measurement will be made on each pipe plugged, regardless of pipe diameter.

**B. PAYMENT**

1. Payment for plug and grout existing pipe connection shall be made at the quantity authorized at the unit price indicated on the Bid Schedule.

**1.16 WATER MAINS**

**A. MEASUREMENT**

1. Water mains shall be measured in linear feet to the nearest whole number, along a horizontal plane along the centerline alignment, without deduction for intermediate structures.

**B. PAYMENT**

1. Provision and installation of new pipe of the size indicated by open-cut trench method, complete as specified, including but not limited to utility potholing, pipe materials, all site clearing, existing improvement protection, excavation, joint and pipe restraints, bedding foundation support materials, thrust blocks, backfill, compaction, dewatering, warning/tracer tapes and wires, filter fabrics, approved support of existing utilities, removal and disposal of existing pipes and structures as shown on the Drawings, removal and disposal of trench spoils, old pipes and old structures required to be removed, surface restoration in the trench repair area prior to final paving, cleanup, testing of new pipe, and all labor, equipment, materials and incidentals required for the work. No separate payment will be made for modifying the original horizontal or vertical alignment to avoid existing utilities, mains or services not shown, except where authorized for additional pipe and/or fittings.

**1.17 YARD HYDRANTS**

**A. MEASUREMENT**

1. Yard hydrants will be measured based on the number of hydrants installed at the size and type indicated on the Bid.

**B. PAYMENT**

1. Payment for hydrants will be made at the authorized quantity installed, at the unit price indicated in the Bid. No separate payment shall be made for fitting restraint, to include thrust blocking, retainer glands or harnessing at the hydrant.

**1.18 FITTINGS**

**A. MEASUREMENT**

1. Fittings will be measured based on the number of fittings installed with restraint at the size and type indicated on the Bid.

**B. PAYMENT**

1. Payment for fittings will be made at the authorized quantity installed, at the unit price indicated in the Bid. No separate payment shall be made for fitting restraint, to include thrust blocking, retainer glands or harnessing at the fitting.

**1.19 VALVES**

**A. MEASUREMENT**

1. Measurement for payment for valves shall be based on the number of valves installed in place at the size and type of valve identified on the Bid.

**B. PAYMENT**

1. Payment for valves will be made at the unit price indicated on the Bid. This bid price shall constitute full payment for valves, complete in place, including pipe connection,

thrust blocks, valves, valve box, extension stem, marker, and all incidentals as called for on the drawings and in the specifications.

## **1.20 FORCE MAINS**

### **A. MEASUREMENT**

1. Force mains shall be measured in linear feet to the nearest whole number, along a horizontal plane along the centerline alignment, without deduction for intermediate structures.

### **B. PAYMENT**

1. Provision and installation of new pipe of the size indicated by open-cut trench method, complete as specified, including, but not limited to, utility potholing, pipe materials, lining of pipe, all site clearing, existing improvement protection, excavation, joint and pipe restraints, bedding foundation support materials, thrust blocks, backfill, compaction, dewatering, warning/tracer tapes and wires, above ground markers, filter fabrics, approved support of existing utilities, removal and disposal of existing pipes and structures as shown on the Drawings, removal and disposal of trench spoils, old pipes and old structures required to be removed, surface restoration in the trench repair area prior to final paving, cleanup, testing of new pipe, and all labor, equipment, materials and incidentals required for the work. No separate payment will be made for modifying the original horizontal or vertical alignment to avoid existing utilities, mains or services not shown, except where authorized for additional pipe and/or fittings.

## **1.21 PUMP STATION PACKAGES**

### **A. MEASUREMENT**

1. *The bid item for each of the Saluda Pump Station Packages includes all labor, equipment, materials and services for the furnishment of the pump station packages. Measurement for the Saluda Pump Station Packages shall be based on the provided schedule of values submitted.*

### **B. PAYMENT**

1. *Payment for the Saluda Pump Station Packages shall be made at the lump sum price provided in the Bid. The work shall include, but not limited to, pumps, piping, supports, valves, electrical and instrumentation components, panels, connections to influent and effluent lines, testing, start-up of equipment, and all other work and appurtenances not specified in other bid items and as described in Appendix F.*

## **1.22 SALUDA PUMP STATION 2**

### **A. MEASUREMENT**

1. The bid item for Saluda Pump Station 2 includes all labor, equipment, materials and services for the construction of the pump station, complete and in service. Measurement for the Saluda Pump Station 2 shall be based on the schedule of values submitted.

### **B. PAYMENT**

1. Payment for the Saluda Pump Station 2 shall be made at the lump sum price indicated in the Bid. The work shall include, but not limited to, site work, pumps, piping, supports, valves, electrical and instrumentation components, panels, valve vault, wet well, connections to influent and effluent lines, testing, start-up of equipment, and all other work and appurtenances not specified in other bid items. The delineation of force main piping shall be at station 0+00.

### **1.23 SALUDA PUMP STATION 3**

#### **A. MEASUREMENT**

1. The bid item for Saluda Pump Station 3 includes all labor, equipment, materials and services for the construction of the pump station, complete and in service. Measurement for the Saluda Pump Station 3 shall be based on the schedule of values submitted.

#### **B. PAYMENT**

1. Payment for the Saluda Pump Station 3 shall be made at the lump sum price indicated in the Bid. The work shall include, but not limited to, site work, pumps, piping, supports, valves, electrical and instrumentation components, panels, valve vault, wet well, connections to influent and effluent lines, testing, start-up of equipment, and all other work and appurtenances not specified in other bid items. The delineation of force main piping shall be at ninety (90) degree bend located below the pump station foundation.

### **1.24 ELECTRICAL IMPROVEMENTS**

#### **A. MEASUREMENTS**

1. Electrical Improvements shall include all labor, equipment, materials and services for installation of electrical improvements, complete and in service. Measurement for Electrical Improvements shall be based on the schedule of values submitted.

#### **B. PAYMENT**

1. Payment for Electrical Improvements shall be made at the lump sum price indicated in the Bid. The work shall include, but not be limited to, the installation of conduit, cable, grounding, commissioning, facilitation of transformer relocation, and the installation of the generator and its appurtenances.

### **1.25 DIESEL ENGINE DRIVEN GENERATOR SETS**

#### **A. MEASUREMENT**

1. Measurement for generators shall be based on the generator furnished at the size and type identified in the Contract Documents.

#### **B. PAYMENT**

1. Payment for Diesel Engine Driven Generator Sets shall be made that the unit price indicated on the Bid. This bid price shall constitute full payment for generators, delivered to site, including transfer switches, and all incidentals as called for on the drawings and in the specifications.



## **1.26 DEMOLITION**

### **A. MEASUREMENT**

1. The bid item for Demolition shall be on a lump sum basis in accordance with a well-balanced detailed apportionment of the work.

### **B. PAYMENT**

1. Payment for Demolition shall include all labor, equipment, materials and services for the demolition, salvage, and abandonment of the existing Saluda Pump Stations 2 and 3 and associated pipelines, manholes, electrical panels, generator, and other appurtenances as shown on the Drawings and as specified in 31 10 00.

## **1.27 SITE IMPROVEMENTS**

### **A. MEASUREMENT**

1. The bid item for Site Improvements shall be on a lump sum basis in accordance with a well-balanced detailed apportionment of the work.

### **B. PAYMENT**

1. Payment for Site Improvements shall include all labor, equipment, materials and services for grading the site (including retaining walls), gravel pavement for the site and access drive, fencing, *all work required to ensure publicly maintained roads utilized for ingress/egress are returned to preconstruction conditions including any necessary improvements to stormwater conveyance infrastructure*, and other civil/site improvements and appurtenances as shown on the Drawings.

## **1.28 REMOVE AND REPLACE PAVEMENT**

### **A. MEASUREMENT**

1. Asphalt and/or concrete pavement removal and replacement includes all work necessary to remove existing paving, providing and compacting select backfill, replacing the pavement, restriping the pavement, providing traffic control and providing temporary measures for maintaining traffic. Measurement shall be based on square yards, to the nearest one-tenth, at the type of pavement specified. The allowable quantity for pavement replacement will be limited to the standard cross section shown on the drawings.

### **B. PAYMENT**

1. Payment for remove and replace pavement will be made for the quantity authorized at the type indicated, in square yards, at the unit price indicated in the Bid Schedule. No additional payment will be made for repairing damaged pavement adjacent to the saw cut.

## **1.29 CASH ALLOWANCES**

- A. The Contractor shall include in the bid total, the amount shown for each allowance shown on the Bid. The allowances shall cover the net costs of the services provided by a firm selected by the Owner. The Contractor's costs associated with the items listed, to include labor, overhead, profit and other expenses, shall be included in other items to which the allowance may pertain.

- B. Should the cost of the allowance be greater or less than the amount shown, the Contract will be adjusted as needed, in accordance with provisions in the Contract Documents.
- C. Construction Verification Surveying
  - 1. This allowance is for the use of an independent surveying firm, selected by the Owner, to perform horizontal and vertical alignment verification at the direction of the Engineer. The allowance is solely for the use of the Engineer, and in no way relieves the Contractor from his responsibility to install reference points, centerlines, and benchmarks, develop cut sheets, or verifying his work.
- D. Blasting Monitoring
  - 1. This allowance is for the use of an independent specialty subcontractor, beyond the Contractor's requirements set forth in Section 31 23 16, to monitor the blasting during construction when directed by the Owner or Engineer.
- E. Soils & Materials Testing
  - 1. This allowance is for the use of an independent testing firm and/or laboratory to be retained by the Contractor for testing soil conditions, including trench excavation, backfill and compaction.
- F. Nonpotable Well Refurbishment
  - 1. This allowance is for the procurement of a Certified Pump Installer (CPI) as certified by the National Ground Water Association (NGWA) for evaluating the existing well casing, equipment, housing, and ground water conditions at Saluda Pump Station 2. The evaluation and resulting recommendation will be conveyed to the Owner and Engineer for consideration. This allowance will cover the cost of equipment labor and materials for the condition assessment and replacing/refurbishing the non-potable well pumping system.
- G. Transformer Relocation
  - 1. This allowance is for the payment of fees (if applicable) to the power utility by the Contractor for the relocation of the existing three (3) phase transformer.
- H. Contingency Allowance
  - 1. The contingency allowance is intended to provide adequate budget to cover items not precisely determined by the Owner and unforeseeable conditions prior to bid. The Contractor shall include 5% of the sum cost of both pump stations to be used by the Owner for items not specifically identified in the Contract Documents. The Owner will specifically authorize any items to be covered under the Contingency Allowance. The Contractor shall invoice items authorized for payment under the Contingency Allowance with his monthly pay applications. The amount invoiced will be deducted from the lump sum amount.

**END OF SECTION**