

## SECTION 11

### MEASUREMENT AND PAYMENT

#### PART 1 - GENERAL

##### 1.01 SCOPE

This section describes the methods by which measurement will be made of the quantities for which payment will be made for the project.

It is the intention of this Specification that payment will be made for those items listed in the Bid Form only. All items of work not specifically listed in the Bid Form shall be considered incidental to the construction, and the cost of all such work and material shall be included in the prices bid for the various items listed.

#### PART 2 - PRODUCTS

##### 2.01 MEASUREMENT AND PAYMENT

Partial payment shall be made for approved materials stored at the project site at the presentation of material invoices in the proper manner. For ongoing construction contracts, stored materials will be addressed as a part of the monthly partial payment request.

#### PART 3 - EXECUTION

##### 3.01 OTHER SECTIONS

No separate payment shall be made for work included in the following Sections. The cost of this work shall be included in the unit prices and/or lump sum prices bid for other items of work.

SECTION 1	INFORMATION FOR BIDDERS
SECTION 5	STANDARD AGREEMENT BETWEEN OWNER AND CONTRACTOR
SECTION 6	GENERAL CONDITIONS
SECTION 7	SUPPLEMENTARY GENERAL CONDITIONS
SECTION 8	SPECIAL CONDITIONS
SECTION 11	MEASUREMENT AND PAYMENT
SECTION 13	GUARANTEES AND WARRANTIES

SECTION 15	PROJECT RECORD DOCUMENTS
SECTION 40	CONCRETE REINFORCEMENT
SECTION 110	SEEDING
SECTION 130	STERILIZATION
SECTION 150	SLOPE PROTECTION AND EROSION CONTROL
SECTION 200	CONSTRUCTION DETAIL DOCUMENTS

### 3.02 SECTION 20 - EARTHWORK

#### A. Measurement and Payment

##### 1. Excavation

- a. No separate measurement or payment will be made for trench earth excavation for sewers and other pipelines, nor for any other appurtenant facilities such as manholes, inlets, outlets, headwalls, collars, saddles, piers, and pipe protection or encasement. Payment for all such excavation shall be included in the unit price bid per linear foot of the varies sizes of pipe laid for the respective trench depths as provided for in the contract Bid Schedule. Trench depths shall be the vertical distance between the ground surface and the invert elevation of the pipe. Where special bedding or cradles are shown on the Drawings or required by the Engineer, no allowance shall be made for extending earth excavation in the trenches to the bottom of such bedding or cradles; such costs shall be included in the unit price bid for bedding materials or cradles.
- b. The removing of all pavements, pavement foundations, sidewalks, driveways, etc., will be included in the trench excavation for which payment will be made as provided for in paragraph a. above. No separate payment will be made for these items.
- c. No separate payment shall be made for pumping, bailing, draining, clearing, grubbing, backfilling, borrow excavation, removing vegetable growth, debris, buildings, or waste material nor for the disposal of any materials or similar work. Where sewers or structures are located in, near or across stream beds or drainage ditches no separate payment shall be made for diverting the stream flow or drainage and dewatering each section as the work progresses.

##### 2. Sheeting and Shoring

No measurement or payment will be made for sheeting and shoring left in place in trenches in accordance with these Specifications unless the upper portion is likewise ordered to be left in place under written instructions from the Engineer, in which case, sheeting so ordered to be left in place

shall be measured by nominal thousand feet board measure of timber. Payment shall be made for the quantities determined as specified above at the unit price bid per MFBM. No allowance shall be made for spikes, screens, hardware, etc., the cost of which shall be included in the unit price bid per MFBM of sheeting and shoring left in place.

3. Bedding Material

Bedding material for trench stabilization, rock trench bedding, or other use as required by these Specifications and/or shown on the Drawings shall be measured by the cubic yard of bedding required for the specified trench width only. Payment for crushed stone or gravel placed as required by the Drawings or Specifications or as directed by the Engineer shall be made for the quantities determined in the manner specified above at the unit price bid per cubic yard of crushed rock bedding material in the Contract Bid Schedule and shall include the cost of removing all subgrade materials regardless of classification to the required or specified bottom of the crushed stone bedding. No separate payment shall be made for bedding, but payment shall be included in the unit prices for pipe.

4. Rock Excavation

a. Definition

- (1) Sound, solid rock in its original position in ledges, bedded deposits, or masses of such hardness and texture that, in the opinion of the Engineer, cannot be loosened or broken down and removed by use of heavy construction equipment such as power shovels, bulldozers, heavy-duty rooters, etc., without drilling and blasting, shall be classified as rock excavation.
- (2) Boulders, stones, or pieces of masonry that are one-half cubic yard or larger in volume shall be considered rock excavation.
- (3) Hard pan, small boulders less than one-half cubic yard in volume, chert, clay, soft shale, soft and disintegrated rock, and similar material shall not be considered as rock even though the Contractor elects to excavate same by drilling and blasting methods.

b. Determination of Pay Quantities

- (1) The volumes of rock excavation for which payment will be

allowed shall be expressed in cubic yards as computed from cut measurements.

- (2) For pipeline excavation, the allowable volume of rock excavation shall be based on the maximum allowable width of trench as shown on the plans and specified herein, and on the centerline depth of rock from the top of rock to the specified bottom of the trench plus whatever depth is required by the plans and Specifications for bedding if rock extends to such depth, or to the bottom of the rock if above these depths. No allowance shall be made for excavating to extra widths for construction of pipeline appurtenances, or for any other reason, and costs of such additional rock excavation shall be included in the unit price bid for this item.
- (3) Rock excavation shall be computed by the average-end-area method. All measurements shall be taken to the nearest 1/10 foot.

c. Payment

1. Payment for rock excavation performed under these Specifications shall be made for the quantities determined in the manner specified above at the applicable contract unit price per cubic yard as listed in the Bid Schedule.
2. These amounts, so paid, shall cover the cost of furnishing all labor, materials, tools, plant, and other expense in connection with or incidental to rock excavation.

### 3.03 SECTION 30, CAST-IN-PLACE CONCRETE

A. Measurement and Payment

1. Except for concrete sidewalks, paving, concrete for manholes, railroad and highway crossings, etc., payment for which is provided elsewhere. Payment for Class A and Class B concrete shall be made for the quantities placed at the unit prices bid per cubic yard in the Bid Schedule. These equipment, tools, plant services, and other expenses in connection with or incidental to the concrete work.
2. The volumes of each class of concrete for which payment will be allowed shall be expressed in cubic yards as computed from the dimensions of the neat lines shown on the Drawings. Where concrete masonry for which specific dimensions are not given on the Drawings

has been placed under the direction of the Engineer, the volume shall be determined by the Engineer from field measurements.

3. The volume allowed for payment shall include only the items of concrete placed in accordance with these Specifications and accepted by the Engineer. No deductions will be made for pipe or conduit runs 3 inches or under or for individual cavities or embedded pieces less than 1 cubic foot each or for reinforcement.

3.04 SECTION 50, DUCTILE IRON PIPE, DUCTILE IRON AND CAST IRON FITTINGS

SECTION 60 POLYVINYL CHLORIDE (PVC) WATER PRESSURE PIPE

A. Measurement

1. Polyvinyl chloride pipe and ductile iron pipe installed underground shall be measured in linear feet along the centerline of the installed pipe with no deduction for fittings, valves, etc., within the limits of the installation work performed under these Contracts.
2. The weight of cast iron or ductile iron fittings for which payment will be made under this section shall be the number of pounds of fittings furnished and placed, jointed and tested, in accordance with these Specifications. The total weight of all fitting shall be the catalogue weights as published for each type furnished and placed. No payment will be allowed for weights of jointing compound, bolts, nuts, washers, or gaskets which shall be considered an incidental part of the fitting and included in the unit price bid per pound for fittings.
3. Any necessary repairs to existing mains and service lines damaged during performance of work under these Contracts shall be made at the Contractor's expense and no reimbursement will be made for any labor, material, equipment, or other costs involved in such repairs. Materials furnished by the Owner shall not be used for such repairs unless approved by the Owner and the Contractor compensates the Owner for the cost of such materials so used.
4. Where connections are shown or required to be made between new and existing water mains, the cost of all such work, services, and equipment, including excavation, cutting pipe, pumping, etc., as required to complete such connections shall be included in the unit prices bid in the Bid Schedule and no separate payment therefor will be made. Payment for furnishing and installing any new pipe and fittings and furnishing and installing accessory items such as valves, etc., required for such connections shall be made at the applicable unit prices bid.

5. Concrete for pipe protection and encasement and concrete thrust blocking at bends and other fittings, when and as authorized by the Engineer, shall be paid for at the unit price per cubic yard of Class B Concrete as set forth in the Bid Schedule.
6. Crushed rock, gravel, or other approved bedding material placed in accordance with Drawing dimensions and these Specifications shall be expressed in linear feet of bedding measured along the centerline of the trench.

B. Payment

1. Payment for furnishing, testing, sterilizing, placing in service and installing, complete in place, polyvinyl chloride pipe, ductile iron pipe, and specials, including all common excavation and backfill, shall be made per linear foot of pipe installed at the applicable contract unit prices set forth for each size and type of pipe in the Bid Schedule.
2. Payment so made shall constitute full compensation to the Contractor for material, excavation and backfill, installation, sterilization and tests, including all labor, materials, tools, equipment, and services necessary to complete the work as specified herein.

3.05 SECTION 65, WATER SERVICE LINE INSTALLATION

A. Measurement

1. The quantity of services installed for which payment will be allowed shall be the actual number and size installed by the Contractor complete and accepted by the Engineer.
2. The quantity of copper tubing and fittings placed underground for which payment will be allowed shall be expressed in linear feet for each size of tubing installed and shall be measured along the central axis of the pipe after the pipe and fittings have been installed. Measurement shall be from the corporation stop on the water main to a point 2 feet from connection with a satisfactory existing service line or to a point 2 feet from the the curb stop in a new meter box.

B. Payment

1. Payment for furnishing and installing all copper tubing and fittings for service lines placed in underground installations shall be paid for at the applicable unit prices bid in the Bid Schedule for the actual number of

linear feet of each size copper tubing placed. No additional payment shall be allowed for plugs or markers used on service lines.

2. No separate payment will be made for connecting pipe on air release valves, gauges, etc., fittings, joint materials, excavation, boring, jacking, service ties, sterilizing, or testing. The cost of these items of work shall be included in the applicable unit prices bid per linear foot for each size and type of pipe.
3. Payment for furnishing all new meter services complete with meter box, saddles, corporation stops, angle valves, and all other fittings and accessories including excavation and backfill as specified and required for a proper installation shall be made at the applicable unit price bid in the Bid Schedule for each meter service installed.

### 3.06 SECTION 70 POLYVINYL CHLORIDE (PVC) SEWER & SERVICE PIPE

#### A. Measurement

1. The quantities of pipe sewers and service lines, including unclassified excavation, for which payment will be allowed shall be expressed in linear feet for each size and type of pipe and applicable depth as shown in the Bid Schedule and shall be the horizontal length of sewer installed complete in place as measured along the centerline of the sewer with no deductions made for tee connections or manholes. The applicable vertical depth shall be measured from the original ground surface to the invert of the sewer and shall be as shown on the Bid Schedule.
2. The quantities of tee connections and plugged stubs for which payment will be allowed shall be the actual number of each size and type furnished and installed by the Contractor.
3. Reinforcing steel, rock excavation, concrete, pipe protection and/or encasement, crushed rock, gravel, or other approved bedding materials, and sections of work not specifically listed in the Bid Schedule shall not be separately measured and paid for but costs for same shall be included in the unit price or lump sum price bid for other sections of work.
4. The quantities of connecting risers for which payment will be allowed shall be expressed in linear feet of pipe and bends and shall be the vertical length of riser installed in place as measured along the centerline of the riser from the centerline elevation of the sewer line to the top of the riser connection as shown on the Drawings. No separate payment will be made for bends, concrete or plastic film markers used

in this construction, payment therefor being included in the linear feet of riser pipe paid for in this category.

B. Payment

1. Payment for pipe sewers, service lines, tees, risers, plugged stubs, and connections to sewer pipe constructed under these Specifications shall be made for the quantities determined in the manner specified above at the contract price per linear foot or per each, as applicable, for each of the applicable pipe and special sizes and types listed in the contract pay items in the Bid Schedule.
2. Payment for concrete and bedding materials furnished and placed under this Specification shall be made for the quantities determined in the manner specified above at the contract price per cubic yard and as listed under the applicable items of the Bid Schedule as specified.
3. No separate payment shall be made for furnishing and installing stoppers. The cost of this item shall be included in the unit prices bid for other items of work done in the Bid Schedule.
4. No separate payment shall be made for furnishing and installing adapters, bends, increasers and tees, cleanouts and other fittings and accessories in the building service lines. The cost of these shall be included in the unit prices bid for service lines in the Bid Schedule.
5. The quantities of cast iron and ductile iron pipe sewers installed in casing pipes for railroad or highway crossings for which payment will be made under this item shall be expressed in linear feet for each size and type of pipe as shown in the Bid Schedule and shall be the horizontal length of cast iron or ductile iron sewer installed complete in place as measured along the centerline of the sewer with no deductions made for manholes.
6. No separate payment shall be made for connections to existing sewers and to manholes, or inlets. The cost of this work shall be included in the unit price bid for other items of work.
7. No separate payment shall be made for any unclassified or borrow excavation, clearing, or backfill in connection with sewer line construction. The cost of these items shall be included in the unit prices bid for pipe sewers.
8. These amounts shall cover the cost of furnishing all materials, tools, labor, plant, equipment, services, and other expenses in connection with common trench excavation and furnishing and installing all items

of work herein specified and when so paid, shall constitute full compensation to the Contractor.

### 3.07 SECTION 80, MANHOLES

#### A. Measurement and Payment

1. The quantities of standard manholes as shown on the Drawings for which payment shall be allowed, shall be the actual number of each type, size, and applicable depth of manhole, 6 feet deep or less, installed by the Contractor and accepted by the Engineer.
2. The depth of standard manholes will be measured from the top of the manhole frame to the invert of the lowest sewer leaving the manhole. The depth of special manholes constructed on top of concrete junction chambers, precast concrete tee manhole bases or curved manhole bases, cast in place, will be measured from the top of the manhole frame to the top of the concrete of the junction chamber, precast concrete tee base or curved manhole base, cast in place.
3. For manholes more than 6 feet in depth, payment will be allowed for extra depth per vertical foot for each foot thereof over 6 feet at the applicable unit price provided for in the Bid Schedule. Fractions of a foot of extra depth shall be accumulated until one extra foot has been constructed and then considered for payment.
4. Payment for precast concrete tee manhole bases shall be the actual number of each size furnished and installed by the Contractor and accepted by the Engineer.
5. Junction Chamber Payment for furnishing all materials, labor, etc., including unclassified excavation, concrete, reinforcing steel, toe pockets, maintenance of existing sewage flow, required adjustment of existing sewers, topsoil, and seeding, all required to complete the junction chamber as shown on the Drawings and in the applicable Specifications shall be included in the applicable lump sum price bid for junction chambers listed in the Bid Schedule. Payment for pipe sewer will not be allowed through the junction chamber.
6. All other items such as pavement replacement, plugged stubs, etc., shall be paid for under their respective items in the Bid Schedule as elsewhere provided herein.
7. Payment for all manholes as constructed under these Specifications shall be made for the quantities determined in the manner specified above as listed under the applicable pay items in the Bid Schedule.

These amounts, so paid, shall constitute full compensation to the Contractor under this item and shall cover the cost of furnishing all labor, materials, tools, plant equipment, services, and other expenses in connection with the construction of manholes, complete in place, including unclassified excavation, backfill, masonry, all castings, concrete, reinforcing steel, inspection, and test, all as herein specified.

8. All drop manholes shall be measured and paid for as specified for standard manholes and, in addition, extra payment will be allowed at applicable contract unit price for each drop connection, including excavation, pipe specials, riser pipe, and concrete encasement as provided for in the Bid Schedule.
9. Payment for manhole adjusting rings furnished for future paving shall be made for the actual number furnished by the Contractor and accepted by the Engineer.
10. Payment for curved manhole bases, cast-in-place, shall be made at the applicable bid price for Class A concrete and reinforcing steel shown in the Bid Schedule. Measurements shall be made in accordance with the applicable provisions of these Specifications. No separate payment shall be made for excavation, backfill, or castings required to complete the work.

### 3.08 SECTION 90, VALVES

#### A. Measurement

Various types of valves as specified and shown on the Drawings shall be measured as a number of valves per type and size as reflected in the Bid Schedule.

#### B. Payment

Payment for furnishing and installing various type valves, complete in every respect as specified and shown on the Drawings shall be made at the applicable unit prices, each, bid for each size and type in the Bid Schedule or where applicable shall be included in the lump sum price bid for other items of work. The amount so paid shall cover the total cost of furnishing valve boxes, valve pits, bypass valves, common excavation, backfill, jointing materials, labor, equipment and services, all as herein specified and shown on the Drawings and payment so made shall constitute full compensation to the Contractor for the complete valve installation.

### 3.09 SECTION 100, FIRE HYDRANTS

## Measurement and Payment

1. The quantity of fire hydrants installed for which payment will be allowed shall be the actual number of installations constructed by the Contractor complete as shown on the contract drawings and accepted by the Engineer.
2. Payment for fire hydrant installation constructed under these specifications shall be made for the quantity determined at the applicable unit price bid as contained in the Bid Schedule. Included in the unit price shall be the full compensation for common and rock excavation, D.I. pipe and fittings from the main water supply line to the fire hydrant including tee, gate valve, valve box, fire hydrant, bedding material, thrust block, backfilling, disposal of excess or unsuitable material, final clean up and completing all incidentals, and for furnishing all equipment, tools, labor, and incidentals necessary to complete the work.
3. Normal fire hydrant bury lengths for new water line installations is 3.5 feet. Where conditions or circumstances require a longer bury length, fire hydrant extensions may be ordered and installed only with the approval of the Engineer. Each extension length must be reviewed and approved by the Engineer on a case by case basis. Payment for fire hydrant extensions will be made per vertical foot as stated in the contract Bid Schedule. No payment will be made for extensions where the Contractor did not meet all water line extension requirements in these specifications or did not obtain the approval from the Engineer.

### 3.10 SECTION 120, NEW AND REPLACEMENT PAVEMENT CURBS, AND SIDEWALKS

#### A. Measurement

1. The quantities of crushed stone backfill for which payment will be made shall be expressed in linear feet of crushed stone backfill measured along the centerline of the trench and for the specified trench width for sewer lines and appurtenances placed in or across existing paved streets, driveways, and parking areas.

2. a. The quantities of the various types of paving for which payment will be made shall be expressed in linear feet of street occupied by the main sewer and shall be measured along the centerline of the street from the point of entry to the exit point. When the paving is to be replaced for trench width only no separate payment will be made for replacing paving over service lines extending from the main sewer line to the edge of paving but the cost of such paving over the trenches cut for service lines shall be included in the price bid for replacing paving over the main service lines as determined above. If the street is to be repaved full street width, the Contractor shall satisfy himself as to the average width of the street. Payment will be allowed only one way through street intersection when full width of street is paved. No separate payment will be made for replacing pavement over the trenches cut for service lines.
- b. In streets having asphaltic concrete paving over portland cement concrete base, the quantity of concrete base shall be expressed as linear feet of sewer line trench as measured along the centerline of the main sewer lines and service lateral lines.
- c. The quantity of paving replacement in asphalt drives and parking lots for which payment will be allowed shall be expressed as linear feet of sewer trench centerline.
3. The quantity of sidewalks for which payment will be made shall be expressed in square feet and shall be obtained from surface measurements.
4. The quantity of asphaltic concrete curbs for which payment will be made shall be expressed in linear feet of asphaltic concrete curb.
5. The quantity of Portland cement concrete curbs for which payment will be made shall be expressed in cubic yards of Class A Concrete, as specified under Section 30 of these Specifications.
6. The quantities of Portland cement concrete paving in driveways for which payment will be made shall be expressed in square feet and shall be determined from surface measurements.

B. Payment

1. Payment for each type of pavement, sidewalk, asphalt curb, and crushed stone backfill furnished and installed under these Specifications shall be made for the quantities determined in the manner specified above at the applicable contract unit prices stated in

the Bid Schedule. This amount, so paid, shall be compensation in full for furnishing all labor, materials, tools, plant equipment, services and other work in connection with or incidental to the construction of the roadway pavement.

2. When full width paving is required, no separate payment shall be allowed for extending paving into existing paved driveways in order to provide a smooth transition from the full width paved street to the existing driveway grade. The work shall be completed to the satisfaction for the Engineer with no separate payment being allowed.
3. No separate payment will be allowed for replacing or repairing unpaved, crushed stone, gravel or chert street surfaces, driveways or parking areas as specified in this section.
4. No separate payment will be made for placing crushed stone in the top four (4) inches of trenches as required under Section 20 of these Specifications nor for the temporary surface as required in this section. The cost of furnishing and placing this material shall be included in the price bid per linear foot of pipe under Sections 50, 60, or 70 of these Specifications.
5. Payment for concrete curbs installed under these Specifications shall be made at the applicable unit price per cubic yard of concrete under Section 30 of these Specifications.
6. No separate payment will be made for street cleanup, maintenance, or preparation for paving. The cost of this work is to be included in the unit price bid for crushed rock backfill in the Base Bid.

3.11 SECTION 140, RAILROAD AND HIGHWAY CROSSINGS (BORING METHOD)  
SECTION 145, RAILROAD AND HIGHWAY CROSSINGS (TUNNEL METHOD)

A. Measurement and Payment

1. Payment for furnishing all labor, materials, equipment, and services required for the complete installation of casing pipe by boring or jacking methods, and steel liner plates by construction in tunnels including all classes of excavation, sand fill, concrete, wooden blocks, etc., all in accordance with these Specifications and details shown on the Drawings, shall be made at the applicable unit price bid in the Bid Schedule for the actual number of linear feet of casing pipe or liner plates installed. This measurement shall be made from outside end to outside end of casing pipe or liner plate and shall include the end sections that may be installed in open trench excavation.

2. Payment for furnishing all labor, materials, equipment and services required for the complete installation of casing pipe or steel liner plates by open-cut method, including all classes of excavation, sand fill, concrete, wooden blocks, removal and replacement of pavement, removal and replacement of tracks, ties, etc., backfill in accordance with instructions and details shown on the Drawings, crushed stone backfill, cement stabilizer, etc., all in accordance with the Specifications and details shown on the Drawings shall be made at the applicable unit price bid in the Bid Schedule for the actual number of linear feet of casing pipe or steel liner plates installed.
3. No separate payment shall be made for any pavement replacement for highway crossings installed by open-cut methods. The cost of this work shall be included in the unit prices bid for highway crossings installed by open-cut methods under Section 140 of the Bid Schedule.
4. Carrier pipe shall be furnished, installed and paid for under applicable provision of Section 50, Cast Iron and Ductile Iron Piping, or under Section 70, Polyvinyl Chloride (PVC) Pipe Sewers, of these specifications at the unit price bid under the respective section in the Bid Schedule.
5. Payment for sewer line construction in railroad and state highway rights-of-way shall be contingent upon approval and acceptance by the railroad or highway department.

\*\* END OF SECTION \*\*