

## **00950 - MEASUREMENT & PAYMENT (CITY FUNDED PROJECTS)**

(Last revised 7/24/06)

SELECTED LINKS TO SECTIONS WITHIN THIS SPECIFICATION

[Base Course & Paving](#)

[Curb & Gutter, Driveways, Sidewalks & Misc. Concrete](#)

[Earthwork](#)

[Items Miscellaneous to all sections](#)

[Trenching, Backfilling & Compaction of Utilities](#)

[Sanitary Sewer](#)

[Storm Drainage](#)

[Water Distribution](#)

### **1.1 TRENCHING, BACKFILLING AND COMPACTION OF UTILITIES**

Measurements for purpose of payment shall be in accordance with the unit quantities stated in the proposal as defined below. Whenever units of measure, (i.e. linear feet, each, and similar units of measurement) are mentioned in a proposal, it shall be interpreted to mean the unit installed in accordance with the plans and specifications, and ready for use. Prices for the following bid items shall include all labor, materials, tools, equipment, and other incidentals necessary to complete the work as shown on the plans and in accordance with these specifications.

#### **A. Aggregate Backfill:**

**Measurement:** Coarse granular fill will be measured by the cubic yard in place in the trench.

**Payment:** Price per cubic yard for coarse granular fill shall include all materials, equipment, and labor required to furnish and install #57 or #67 stone in the locations designated by the Public Services Director.

#### **B. Bedding, Haunching, Crushed Stone for Sewer Mains:**

**Measurement:** Bedding stone is considered incidental to the cost of the pipe.

**Payment:** Not a pay item.

#### **C. Excavation and Backfill:**

**Measurement and Payment:** All excavation and backfill shall be included in the cost of the other items bid – not a pay item.

When the removal of existing structures or materials is classified separately as a contract pay item, payment will be made in accordance with the contract price; otherwise, such work will be considered as incidental work and will not be paid for directly, but the cost shall be included in the unit price for other items of work. In

either case, such price or prices shall be full compensation for all labor, materials, tools, equipment, and incidentals necessary to complete the work.

#### D. Exploratory Excavation

**Measurement:** Such excavation, where ordered by the Public Services Director will be measured by the cubic yard.

**Payment:** The cost of such excavation, where ordered by the Public Services Director, will be paid at the contract unit price bid, per cubic yard.

#### E. Foundation Stone:

**Measurement:** Foundation stone used in stabilizing the bottom of trenches will be field measured in the trench by the cubic yard, complete in place.

**Payment:** When the Public Services Director directs the use of foundation stone, foundation stone shall be paid for at the contract unit price for foundation stone by the cubic yard. Payment shall include all materials and labor incidental to the placing of the stone and any additional extra depth of trench or excavation necessary to accommodate the stone including disposal of unusable material necessary to allow for placement of the foundation stone.

#### F. Pavement Removal and Replacement

**Measurement:** Where pavement is encountered, as shown on the plans, pavement removal and replacement will be measured by the square yard regardless of the existing pavement material or depth. See [Specification Division 02275 – Trenching, Filling, and Compaction of Utilities, paragraph 3.7, Pavement Repair and Replacement.](#)

**Payment:** This item will be paid for at the contract unit price per square yard for pavement removal and replacement. The unit price bid shall include all labor, tools, equipment, and material necessary to complete the work and shall include, but is not necessarily limited to, saw cutting the pavement, removal of existing pavement materials which are not suitable for backfilling the trench from the job, placement of suitable backfill material, and the cost for compaction and compaction testing by a certified and approved laboratory. In the case of pavement cut and removal, such price or prices shall include the cost of the required permit for cutting pavement, unless permit fees are included as a bid item in the Contract Documents. Extra width will not be measured for payment and there will be no extra payment for any of the above work, the cost of which shall be included in the unit price bid for pavement removal and replacement.

#### G. Portland Cement Concrete Sidewalk

**Measurement:** Where existing concrete sidewalk is encountered, as shown on the plans, removal and replacement will be measured by the linear foot of sidewalk ordered removed and replaced by the Public Services Director, regardless of the depth of the existing sidewalk.

**Payment:** This item will be paid for at the contract unit price per linear foot for removal and replacement of concrete sidewalk, depth to match the depth removed with no extra compensation for depth. The unit price bid shall include all labor, tools,

equipment, and material necessary to complete the work and shall include, but is not necessarily limited to, saw cutting the sidewalk, removal of all existing materials, which are not suitable for backfill in the trench from the job, compaction of the trench and replacement of the sidewalk.

#### H. Remove and Replace Asphalt Drive and Remove and Replace Concrete Drive

**Measurement:** Where either an existing asphalt or concrete drive is encountered, as shown on the plans, pavement removal and replacement will be measured by the square yard regardless of the existing pavement material or depth.

**Payment:** This item will be paid for at the contract unit price per square yard for removal and replacement of either asphalt or concrete drives. The unit price bid shall include all labor, tools, equipment, and material necessary to complete the work and shall include, but is not necessarily limited to, saw cutting the pavement, removal of all paving materials which are not suitable for backfill in the trench from the job, and compaction of the trench. There will be no extra payment for any of the above work, the cost of which shall be included in the unit price bid for removal and replacement of asphalt or concrete drives.

#### I. Resurfacing Existing Pavement

**Measurement:** Payment for resurfacing existing pavement will be made at the unit price bid per square yard in accordance with field measurements made by the City.

**Payment:** The unit price bid shall include all labor, tools, equipment, and material necessary to complete the work and shall include, but is not necessarily limited to, saw cutting the pavement if necessary, adjusting valves and manholes, and meeting density requirements. Payment will be made per square yard of surface covered. Core samples shall be taken by the Contractor in areas directed by the City. The average depth of the asphalt will be determined from these samples. The unit price paid will be reduced proportionately for each 1/8 inch thickness below the specified thickness. Thicknesses less than 75% of that specified shall receive an additional overlay at the minimum depth recommended by NCDOT for the type of asphalt specified for this project. No additional payment will be made for thicknesses greater than that designed.

#### J. Rock Excavation, Trench:

**Measurement:** Where rock excavation is to be measured for payment, quantities will be as determined by the City. Rock excavation will be measured by the cubic yard. For pay purposes, dimensions shall be computed as the difference in elevation between the top and bottom of the rock (as determined by the City) multiplied by the specified trench width for the pipe size being laid. Where rock is encountered in the bottom of the trench, the maximum depth for payment purposes shall be 6 inches below the bottom of the pipe. Rock excavation shall consist of the removal and satisfactory disposal of all materials, which in the opinion of the Public Services Director, cannot be excavated except by drilling, blasting, "jack hammering or hoe ramming." All boulders containing a volume of more than one-half cubic yard will be classified as rock.

**Payment:** Rock excavation will be paid for at the contract unit price per cubic yard for rock excavation and shall include all labor, materials, insurance, mats, signage, traffic control, tools, equipment and incidentals necessary to excavate and dispose

of rock off site, backfilling the excavated trench to the bottom of the pipe with select backfill material, and shall include the cost of removing all excavated materials which are not suitable for backfill. No payment will be made for rock that has been excavated subsequent to ripping operations.

#### K. **Sheeting and Bracing (Piling)**

**Measurement and Payment:** Payment for sheeting and bracing, except when ordered to be left in place, and all other work incidental to sheeting and bracing, shall not be made separately unless specified or as shown on the plans or as directed by the Public Services Director, but shall be included in the bid price for other items.

When specified, payment for "Timber Sheeting Left in Place" shall be made at the contract unit price bid per 1000 board feet.

When specified, payment for "Steel Sheet Piling" shall be made at the contract unit price bid per square foot.

When specified, payment for "Steel Sheet Piling Left in Place" shall be made at the contract unit price bid per square foot.

#### L. **Select Fill:**

**Measurement:** Trench excavation determined to be unusable by the Public Services Director, or his representative, resulting from material which may be non-compactable, naturally wet (when removed from trench) and otherwise unusable due to too high a moisture content for compaction (as opposed to unprotected soil exposed carelessly to rain which becomes unusable in which case there is no claim for payment for trench borrow). Measurement shall be made along the centerline of the pipe and the pay quantity shall be determined based upon the depth of fill placed times the maximum trench width (pipe outside diameter plus 2 feet). Selected granular backfill in excess of the maximum quantity, as specified, shall be furnished and placed by the Contractor.

**Payment:** Select Fill will be paid for at the contract unit price by the cubic yard and shall include all material, equipment, and labor to furnish, haul, placement, compact the approved material, and haul off unsuitable material, complete in place, in the locations as designated on the drawings or as approved by the Public Services Director.

M. **Other:** Other items shall be paid for as stated in the Proposal.

### 1.2 **WATER**

Measurements for purpose of payment shall be in accordance with the unit quantities stated in the proposal as defined below. Whenever units of measure, (i.e. linear feet, each, and similar units of measurement) are mentioned in a proposal, it shall be interpreted to mean the unit installed in accordance with the plans and specifications, and ready for use. Prices for the following bid items shall include all labor, materials, tools, equipment, and other incidentals necessary to complete the work as shown on the plans and in accordance with these specifications.

**A. Bedding Stone for Water Pipe:**

**Measurement:** When called for in the proposal or on the plans or directed by the Public Services Director, aggregate material used for bedding water lines will be measured by the cubic yard of pipe bedding material placed.

**Payment:** Pipe bedding stone will be paid for at the contract unit price per cubic yard for pipe bedding material, complete and in place.

**B. Blow-Offs:**

**Measurement:** Blow-offs will be measured on a per each basis for the number of blow-offs installed.

**Payment:** Blow-offs will be paid for at the contract unit price per blow-off for the size specified, and all materials incidental to the installation of the blow-off, complete in place. This price shall include, but is not necessarily limited to, valve, piping, plug, fittings, valve box(es), bedding material, thrust collar, rodding, blocking, riser, and other related incidentals as shown on [standard details 514.05 and 514.06](#).

**C. Concrete Encasement**

**Measurement:** Payment for furnishing concrete encasement will be at the unit price bid per cubic yard for the class of concrete stated in the proposal.

**Payment:** The unit price stated in the proposal shall include the cost of additional depth of excavation, forming, the furnishing and placing of concrete, cofferdams, laying of pipe line to grade but excluding the cost of the pipe itself, complete in place, including all labor, equipment, and material, necessary and all other work incidental to the complete installation of the concrete encasement in accordance with the specification and details shown on the plans. Payment will be made to neat lines of construction shown on the plans with no allowance being made for extra ditch width.

**D. Concrete Piers:**

**Measurement:** Reinforced concrete piers shall be measured on an each basis based on the height and the structural details shown on the contract drawings.

**Payment:** This item will be paid for at the contract unit price bid for concrete piers complete in place, including all labor, equipment, and material, necessary for furnishing, excavating, disposal of excess material, stone bedding, reinforcement, anchor bolts, steel straps, concrete, testing, forming, concrete finishing, backfilling, restoration of grade, and all other work incidental to the complete installation of the concrete piers in accordance with the specification and details shown on the plans. Payment will be made to neat lines of construction shown on the plans with no allowance being made for extra ditch width.

**E. Connecting to Existing Mains**

**Not a pay item.** Fittings and specialty items used in making the connections will be measured and paid for at the unit price bid by the Contractor for "Fittings" and at the unit price bid for "Tapping Tees and Valve."

#### F. Dechlorination

**Not a pay item.** The associated work, materials, and labor involved in dechlorinating water is incidental to the cost of the water main construction and shall be included in other bid items.

#### G. Ductile Iron Pipe (For Mains):

**Measurement:** By the linear foot. All pipes shall be measured from the exact beginning of the pipe to the end of the line without deduction for fittings (i.e. fittings and valves) and shall be made through casings. 6-inch hydrant lead-in pipe is not included but is considered incidental to the cost of hydrant installation.

**Payment:** The accepted quantities of water line pipe will be paid for at the contract unit price per linear foot of the various types, depths, and size pipe specified (fittings, valves, and specialty items are paid separately), complete in place. This price shall include labor, equipment, materials, trench excavation (excluding select fill and rock as defined in [item 1.1 J](#)), shoring, or use of trench box, installation, concrete thrust blocking, making connections to existing mains, installing in existing casing, pumping, backfilling, compaction, testing of failed trenches, disposal of excess material, pressure testing, chlorinating, and bacteriological testing and all other work incidental to the complete installation of the mains in accordance with these specifications. Fittings, valves, and specialty items are paid separately.

#### H. Ductile Iron Pipe, Bored and Jacked

**Measurement:** Measurement of Ductile Iron Pipe, bored and jacked, shall be measured by the linear feet of pipe installed. Bored and jacked Ductile Iron Pipe shall include any excavation, any backfill, bore, jacking, the pipe, dewatering, clean up, restoration and any other work required for a complete and acceptable in place installation.

**Payment:** Ductile Iron Pipe, bored and jacked will be paid for at the contract unit price per linear foot for pipe bored, complete, and acceptable in place. The price shall be full compensations for pipe, labor, equipment, and all other work incidental to the complete installation of the mains in accordance with these specifications. Fittings, valves, and specialty items are paid separately. Payment will only be made upon acceptance by the City of Jacksonville and the Consulting Engineer that the bore is installed to the proper elevation and grade. Any deviations, errors, or unacceptable conditions noted by the City of Jacksonville or the Jacksonville office of the North Carolina Department of Transportation (if applicable) will be the responsibility of the Contractor to correct to the full satisfaction of the above mentioned parties without additional compensation.

#### I. Encasement Pipe (bored):

**Measurement:** Steel casing pipe of the wall thickness and diameter specified will be measured by the linear feet of steel casing pipe installed.

Encasement of water lines by the dry bore and jacking method shall include any excavation, any backfill, the encasement pipe, bore, jacking, spiders, the end seals, dewatering, clean up, restoration and any other work required for a complete and acceptable in place installation.

**Payment:** Steel casing pipe will be paid for at the contract unit price per linear foot per diameter per thickness for steel casing pipe bored, complete, and acceptable in place. Payment will only be made upon acceptance by the City of Jacksonville and the Consulting Engineer that the bore is installed to the proper elevation and grade and ready for the installation of the designed carrier pipe without any additional compensation. Any deviations, errors, or unacceptable conditions noted by the City of Jacksonville or the Jacksonville office of the North Carolina Department of Transportation (if applicable) will be the responsibility of the Contractor to correct to the full satisfaction of the above-mentioned parties. The bore shall be paid one time on a linear foot basis. The cost of the carrier pipe is not to be included.

**J. Encasement Pipe (open cut):**

**Measurement:** Steel casing pipe of the wall thickness and diameter specified will be measured by the linear feet of steel casing pipe installed.

Encasement of water lines by the open cut method shall include any excavation, any backfill, the encasement pipe, spiders, the ends seals, dewatering, clean up, restoration and any other work required for a complete in place installation.

**Payment:** Steel casing pipe will be paid for at the contract unit price per linear foot per diameter per thickness for steel casing pipe installed by the pipe open cut, complete and in place. Lines either off on grade or alignment shall be rejected or corrected in a manner approved by the City's Engineer. The cost of the carrier pipe is not to be included.

**K. Excavation and Backfill:**

**Measurement and payment:** In accordance with [Division 02275 - Trenching, Backfilling, and Compaction of Utilities](#), all excavation and backfill for water mains shall be included in the cost of the other items bid – not a pay item.

**L. Fittings and Accessories:**

**Measurement:** Fittings and specialty items used in conjunction with ductile iron or C900 PVC pipe will be measured per each.

**Payment:** Payment for ductile iron fittings shall include all labor, equipment and all materials necessary for installing, making connections to existing mains, tie rods, wedge action restrainer glands, backfilling, testing, sterilizing, and all other work incidental to the complete installation of these fittings in accordance with the specifications.

**M. Fire Hydrants (High Pressure and Low Pressure):**

**Measurement:** Fire hydrants will be measured by the number of hydrants installed on an each basis.

**Payment:** Price shall include all labor, equipment, and all materials (including extensions and fittings), necessary to install the hydrant including construction staking, #57 stone, drainage pit, thrust restraint, 6-inch lead in pipe, valve, painting, testing and disinfecting, complete and in place. No additional compensation will be made regardless of whether the hydrant is a high or low-pressure hydrant. The cost of surveying for staking hydrant location is to be included in the cost of the hydrant

unless an item is provided in the proposal for utility construction staking whereupon the costs shall then be included in that line item. Pavement repair, select fill, and stone for trench stabilization are not to be included in the bid price for the fire hydrant.

**N. Fire Hydrants Removal:**

**Measurement:** Fire hydrants will be measured by the number of existing fire hydrants removed on an each basis.

**Payment:** Price shall include all labor, equipment, and all materials necessary to remove the hydrant including excavation, backfilling, topsoil, additional sod replacement, capping the hydrant lateral, curb/gutter and sidewalk replacement, and delivery of old hydrant to the Public Services Facility (the hydrant shall remain the property of the City). Pavement repair, select fill, and stone for trench stabilization are not to be included in the bid price for the fire hydrant removal.

**O. Fire Vaults and Large Meter Vaults:**

**Measurement:** Vaults for backflow prevention devices, detector check, RPZ, or large meters (meters larger than 2 inches) shall be paid lump sum. Cost for vault is to include all labor, materials, equipment, backfill, compaction, etc. complete and in place. The cost of the vault is to also include the precast reinforced concrete vault, stone bedding, the backflow prevention device and/or meter, gate valves, post indicator valves (if applicable), fittings, check valves, couplings, sleeves, fire department connection (if applicable), hatch, floor drain (if applicable), pipe stands, vents, ladder, painting of pipe and fittings (if applicable), defect repair, testing, etc. necessary to render a complete unit as shown on the contract drawings.

**Payment:** Vault payment will be paid as lump sum.

**P. Foundation Stone:**

**Measurement:** Foundation stone used in stabilizing the bottom of trenches will be field measured in the trench by the cubic yard, complete in place.

**Payment:** When the Public Services Director directs the use of foundation stone, foundation stone shall be paid for at the contract unit price for foundation stone by the cubic yard. Payment shall include all materials and labor incidental to the placing of the stone and any additional extra depth of trench or excavation necessary to accommodate the stone including disposal of unusable material necessary to allow for placement of the foundation stone.

**Q. Miscellaneous Fittings**

**Measurement:** By the piece.

**Payment:** Payment for ductile iron fittings where specified on the plans shall be made per piece. Cost of accessories shall be included in the price of the fitting.

**R. PVC Pipe (when applicable):**

**Measurement:** By the linear foot. All pipes shall be measured from the exact beginning of the pipe to the end of the line without deduction for fittings (i.e. fittings

and valves) and shall be made through casings. 6-inch hydrant lead-in pipe is not included but is considered incidental to the cost of hydrant installation.

**Payment:** The accepted quantities of PVC water line pipe will be paid for at the contract unit price per linear foot of the various types, depths, and size pipe specified (fittings, valves, and specialty items are paid separately), complete in place. This price shall include all labor, equipment, materials, trench excavation (excluding rock and select fill), shoring, or use of trench box, installation, concrete thrust blocking, marking tape, copper wire with valve boxes, making connections to existing mains, installing in existing casing, pumping, backfilling, compaction, testing of failed trenches, disposal of excess material, pressure testing, chlorinating, and bacteriological testing and all other work incidental to the complete installation of the mains in accordance with these specifications. No special payment will be made for fittings, specialty items, or pipe used in making connections to existing mains where such connections are noted on the plans.

#### S. Removal and Disposal of Asbestos Cement Pipe

**Measurement:** When the amount of pipe to be removed is less than 12 feet, the Contractor shall be paid a lump sum per each event. When the amount removed exceeds 12 feet, the Contractor shall be paid the lump sum plus the bid price per linear foot for pipe removed in excess of 12 feet.

**Payment:** Asbestos Cement Pipe removal will be paid for at the contract unit price per lump sum and/or by the foot as bid and shall include all labor, materials, and equipment to excavate, remove and properly dispose of pipe. Contractor shall provide documentation to the City as to the legal disposition of the pipe in accordance with the Solid Waste Disposal Act, as amended from time to time.

#### T. Tapping Sleeve and Valve:

**Measurement:** Tapping sleeve and valve will be measured by the number of each size installed.

**Payment:** Tapping sleeve and valve price shall include furnishing all materials, equipment, and labor to make a wet tap on an existing line, complete in place, to include valve, valve box, stainless steel tapping tee sleeve, tap, tapping machine, anchor blocks, excavations, backfill, disinfection, and testing of sleeve. Wet taps will be paid for at the contract unit price per tap for the size specified, complete in place.

#### U. Testing and Sterilizing

**Not a pay item.** The associated work, materials, and labor involved in testing and sterilizing water mains is incidental to the cost of the water main construction and shall be included in other bid items.

#### V. Tie Rods, Restraint Flange, Retainer Glands and Retainer Clamps:

**Measurement:** Tie rods, wedge action restrainer glands, retainer glands, and retainer clamps are considered incidental to the cost of construction.

**Payment:** Not a pay item.

#### W. Thrust Restraints

**Not a pay item.** Concrete blocking shall be installed as required for all tees, bends etc. per the applicable standard details. No separate payment shall be made for thrust restraints. The cost of thrust restraints is considered incidental to the cost of the contract unit price bid for each applicable fitting bid.

**X. Tunneling:**

**Measurement:** Tunneling will be measured by the linear feet of tunnel installed.

The tunneling method shall include any and all excavation, shoring and bracing, any backfill, steel liner plates and bolts, ventilation system for workers, lagging, spiders, grout plugs, sand-cement grouting of voids, steel drain pipe, french drain, concrete paved invert, the ends seals, dewatering, clean up, restoration and any other work required for a complete in place installation.

**Payment:** Tunneling will be paid for at the contract unit price per linear foot for diameter installed by the tunneling cut, complete and in place. Payment will only be made upon acceptance by the City of Jacksonville and the Consulting Engineer that the tunnel is installed to the proper elevation and grade and ready for the installation of the designed carrier pipe without any additional compensation. Any deviations, errors, or unacceptable conditions noted by the City of Jacksonville or the Jacksonville office of the North Carolina Department of Transportation (if applicable) will be the responsibility of the Contractor to correct to the full satisfaction of the above-mentioned parties. Unit price does not include the carrier pipe.

**Y. Valves – Air Release Valve & Manhole:**

**Measurement:** Air/Vacuum Release valves will be measured on a per each basis for the number of units installed.

**Payment:** Air release valves will be paid for at the contract unit price per air release valve and manhole for the size specified, and all materials incidental to the installation of the air release valve and manhole, complete in place. This price shall include, but is not necessarily limited to, bedding stone, the direct tap and/or saddle, brass plumbing valves, brass street ells and screen, including the doghouse manhole, concrete grade rings (if applicable), and frame and cover, grade adjustments to iron frame if necessary and other incidentals as shown on **standard detail 513.05**.

**Z. Valve with Box:**

**Measurement:** Gate valves and inserting valves will be measured by the number of each size and type of valve installed.

**Payment:** Gate valves and inserting valves will be paid for at the contract unit price, complete in place, per valve for the type and size specified, complete in place. This price shall include all labor, equipment, and materials necessary for installing, valve footing (if applicable), furnishing, backfilling, testing, copper wire with valve box, sterilizing and all other work incidental to the complete installation of the valves, with necessary valve box, in accordance with the specifications. Cost for accessory kit to be included in price of valve.

**AA. Valve Box Removal:**

**Measurement:** Valve box removal will be measured by the number of each valve box removed.

**Payment:** Payment for valve box removal shall be made at the contract unit price for each valve box removed and delivered to the Public Services Facility. Valve box removal shall include removal, placement of select fill material, compaction, and pavement repair. This price shall include all labor, equipment, materials necessary for removal of valve boxes and all other work incidental to the complete removal of the valve boxes in accordance with the specifications.

**BB. Vault (Large Meter/Fire):**

**Measurement:** Measurement of the large meter vaults shall be made in terms of one complete vault and piping assembly. This price shall include all equipment, labor, materials, excavation, backfilling, chlorinating, bacteriological testing, pressure testing, meter, vault, valves, access hatch, and other fittings, etc. as shown on the contract drawings or in the standard details, complete in place.

**Payment:** Large meter vaults will be paid for at the contract price per unit of size indicated, complete in place.

**CC. Water Services, Copper Tubing (Pipe) or Polyethylene (open cut):**

**Measurement:** Measurement of water services shall be made on a per service basis regardless of service pipe material or length.

**Payment:** The water service pipe shall be paid for at the contract unit bid per service of the size indicated on the drawings, complete and in place, at a minimum depth of 24 inches. The price shall include all equipment, labor, and materials for installation, making tap, furnishing and running service line, setting meter box and setter as applicable, testing and disinfection complete in place in accordance with [standard details 513.03, 513.04, 515.01, 515.02, and 515.03](#) as applicable, curb/gutter and sidewalk replacement if necessary. The City will furnish and set meter.

**DD. Water Services Copper Tubing (Pipe) or Polyethylene (by Jacking or Boring):**

**Measurement:** Measurement of jacked water services shall be made on a per service basis regardless of service pipe material or length.

**Payment:** The jacked service shall be paid for at the contract unit bid price per service of the size indicated on the drawings, complete and in place. The price shall include all equipment, labor, and materials for installation, making tap, running or punching service line, setting meter box and setter as applicable, testing and disinfection complete in place in accordance with [standard details 513.03, 513.04, 515.01, 515.02, and 515.03](#) as applicable. The City will furnish and set meter.

**EE. Water Service Line Replacement:**

**Measurement:** Water service line replacement shall be measured on an each basis.

**Payment:** Water service line replacement shall include all materials, labor, and equipment for installation, furnishing pipe, running service line, removal and reconnection of service, testing, disinfection, sidewalk (if necessary) and curb removal and replacement, complete in place. Payment for pavement removal and replacement is paid under [Pavement Removal and Replacement](#).

FF. **Other: Other items shall be paid for as stated in the Proposal.**

### 1.3 SEWER

Measurements for purpose of payment shall be in accordance with the unit quantities stated in the proposal as defined below. Prices for the following bid items shall include all labor, materials, tools, equipment, and other incidentals necessary to complete the work as shown on the plans and in accordance with these specifications.

#### A. Bedding Stone, Granular:

**Measurement:** Stone for bedding, when required, is considered incidental to the cost of the pipe.

**Payment:** Not a pay item.

#### B. Building Connections/Service Laterals:

**Measurement:** Measurement of building connections shall be made on a per service basis regardless of service pipe material or length.

**Payment:** Payment for service laterals shall be at the contract unit price bid, per service, for the sized indicated and shall include bends, wyes, saddles (if applicable), adapters, long sweep elbows, cleanout riser and plugs, and other incidentals as necessary, curb/gutter and sidewalk replacement (if necessary) complete in place as shown on [standard details 533.01, 533.02 and 533.03](#). Any temporary pumps required to by-pass sewer around work areas shall be provided at no additional cost.

#### C. Bypass Pumping:

**Measurement:** Bypass pumping is considered incidental to the cost of the pipe unless otherwise shown in the proposal.

**Payment:** Not a pay item.

#### D. Carrier Pipes (Installed in either Steel Encasements or Tunnel Liners)

**Measurement:** Measurement shall be along the centerline of the pipe.

**Payment:** Payment for carrier pipes will be made at the contract unit price bid per linear foot and shall include all necessary materials, tools, and equipment necessary to install and, if necessary, grout the ductile iron pipe inside the casing. The unit price does not include the casing pipe (see the individual pay items [Encasement Pipe and Tunneling](#)). The unit price shall include the cost of excavation, bedding, backfilling, cleanup, and testing.

#### E. Combination Sewer Force Main Air Valve and Air Release Manhole

**Measurement:** Measurement for combination air valve and air release manholes on force mains shall be on an each basis.

**Payment:** Payment for combination air valve and air release manholes shall be paid for at the contract unit price bid for combination air valve and air release manholes. The price shall include all labor, material, equipment, stone bedding, precast doghouse manhole, cast iron frame and cover, bedding, tap and saddle, valve, concrete grade rings (if applicable), grade adjustments to iron frame if necessary, and other incidentals and piping as necessary, complete in place as shown on **standard detail 534.03**.

#### F. Concrete Encasement

**Measurement:** Payment for furnishing concrete encasement will be at the unit price bid per cubic yard for the class of concrete stated in the proposal; such price is to be paid in addition to that paid per foot of sewer main.

**Payment:** The unit price stated in the proposal shall include the cost of additional depth of excavation, forming, the furnishing and placing of concrete, cofferdams, and laying of pipe line to grade but excluding the pipe itself, complete in place, including all labor, equipment, and material, necessary and all other work incidental to the complete installation of the concrete encasement in accordance with the specification and details shown on the plans. Payment will be made to neat lines of construction shown on the plans with no allowance being made for extra ditch width.

#### G. Concrete – Miscellaneous Unformed:

**Measurement:** Concrete, except that used in manholes, will be measured in cubic yards of unformed concrete actually placed. Typical uses include concrete collars (slope anchors), cradles, and all other miscellaneous concrete related to sewer line installation.

**Payment:** This item will be paid for at the contract unit price per cubic yard for unformed concrete for collars, cradles, and all other miscellaneous concrete related to sewer line installation, in place, including all material, equipment, and labor, to place the concrete in the locations shown on the construction drawings and/or as directed by the Public Services Director including the cost of removing and disposing of the material replaced by the concrete. Payment will be made only for the quantities and dimensions as shown on drawings or applicable details. Price does not include pipe.

#### H. Concrete Piers

**Measurement:** Reinforced concrete piers shall be measured on an each basis based on the height and the structural details shown on the contract drawings.

**Payment:** This item will be paid for at the contract unit price bid for concrete piers complete in place, including all labor, equipment, and material, necessary for furnishing, excavating, disposal of excess material, stone bedding, reinforcement, anchor bolts, steel straps, concrete, testing, forming, concrete finishing, backfilling, restoration of grade, and all other work incidental to the complete installation of the concrete piers in accordance with the specification and details shown on the plans.

Payment will be made to neat lines of construction shown on the plans with no allowance being made for extra ditch width.

**I. Connections to Other Sewers or to Appurtenances**

**Measurement:** Measurement shall be made on an each basis for connections made to other sanitary sewers and appurtenances.

**Payment:** Connections to other sewers or appurtenances shall be made on a lump sum basis and shall be full compensation for removing, repairing, and/or replacing pipe and/or structures and shall be full compensation for the completed work in place including all materials, labor, tools, and equipment.

**J. Ductile Iron Sewer Line**

**Measurement:** See pay item [Measurement of Sewer Pipe](#).

**Payment:** See pay item [Measurement of Sewer Pipe](#).

**K. Encasement Pipe (bored):**

**Measurement:** Steel casing pipe of the wall thickness and diameter specified will be measured by the linear feet of steel casing pipe installed.

Encasement of sewer mains by the dry bore and jacking method shall include any excavation, any backfill, the encasement pipe, bore, jacking, spiders, end seals, dewatering, clean up, restoration and any other work required for a complete in place installation.

**Payment:** Steel casing pipe will be paid for at the contract unit price bid per linear foot per diameter per thickness for steel casing pipe bored, complete and acceptable in place. Payment will only be made upon acceptance by the City of Jacksonville and the Consulting Engineer that the bore is installed to the proper elevation and grade and ready for the installation of the designed carrier pipe without any additional compensation. Any deviations, errors, or unacceptable conditions noted by the City of Jacksonville or the Jacksonville office of the North Carolina Department of Transportation (if applicable) will be the responsibility of the Contractor to correct to the satisfaction of the above-mentioned parties. The bore shall be paid one time on a linear foot basis. The cost of the carrier pipe is not to be included.

**L. Encasement Pipe (open cut):**

**Measurement:** Steel casing pipe of the wall thickness and diameter specified will be measured by the linear feet of steel casing pipe installed.

Encasement of sewer mains by the open cut method shall include any excavation, any backfill, the encasement pipe, spiders, the ends seals, dewatering, clean up, restoration and any other work required for a complete in place installation.

**Payment:** Steel casing pipe will be paid for at the contract unit price bid per linear foot per diameter per thickness for steel casing pipe installed by the pipe open cut, complete and in place. Lines off either on grade or alignment shall be rejected and

corrected in a manner approved by the Public Services Director. The cost of the carrier pipe is not to be included.

**M. Excavation and Backfill:**

**Measurement and Payment:** In accordance with [Division 02275 - Trenching, Backfilling, and Compaction of Utilities](#), all excavation and backfill shall be included in the cost of the other items bid – not a pay item.

When the removal of existing structures or materials is classified separately as a contract pay item, payment will be made in accordance with the contract price; otherwise, such work will be considered as incidental work and will not be paid for directly, but the cost shall be included in the unit price for other items of work. In either case, such price or prices shall be full compensation for all labor, materials, tools, equipment, and incidentals necessary to complete the work.

**N. Cleanout Frame and Cover:**

**Measurement:** When service is located in paved areas, cleanout frame and cover shall be measured on an each basis.

**Payment:** Payment shall be made on an each basis and shall include all labor, equipment, and materials necessary to set and perform final adjustment of the cleanout and frame when service is located in paved areas, as indicated on the plans and in accordance with [standard detail 533.03](#).

**O. Manholes – Standard and Drop:**

**Measurement:** Manholes shall be measured on an each basis for a basic 6-foot deep manhole inclusive of frame and cover and base. For all depths in excess of 6 feet, manholes shall be measured by the vertical foot of depth of the manhole constructed in 2-foot increments (e.g. 0 to 6', 6'-1" to 8'-0", 8'-1" to 10'-0", etc.). For determining the additional depth of manhole to be paid for at the unit price bid per vertical foot, manholes shall be measured from the invert of the pipe outlet to the top of the manhole frame and cover and recorded to the nearest 1/10 of a foot.

Where more than one type or size (diameter) designation is shown on the drawings, or called for in the special provisions, a separate bid item of the following form shall cover each:

- 1) Type (or Size) Manhole, per each.
- 2) Additional Depth of Manhole, per vertical foot.
- 3) Drop Manhole Connection, per vertical foot.

**Payment:** Manholes shall be paid for at the contract unit price bid for a 6-foot deep manhole on an each basis plus a unit price per vertical foot for all depths in excess of 6 feet deep in 2-foot increments (e.g. 0 to 6', 6'-1" to 8'-0", 8'-1" to 10'-0", etc.). Price shall include furnishing and constructing manholes complete-in-place including excavation, connection to existing sewers if necessary (including inside drops where they occur), complete invert forming in accordance with the standards and drawings, rubber boots, bedding stone, furnishing and bolting castings to cone, gaskets, parging interior joints, vent pipe if required (see [standard detail 532.02](#)), grade adjustment and grade rings, if applicable (see [standard detail C06.03](#)), vacuum

testing, backfill and compaction complete in every detail. See [standard details 532.01, 532.02, 532.03, 532.05 and 532.06](#).

**P. Manholes – Doghouse:**

**Measurement:** Manholes shall be measured on an each basis for a basic 6-foot deep manhole inclusive of frame and cover and a base constructed in accordance with [standard detail 532.04](#). For all depths in excess of 6 feet, manholes shall be measured by the vertical foot of depth of the manhole constructed in 2-foot increments (e.g. 0 to 6', 6'-1" to 8'-0", 8'-1" to 10'-0", etc.). For determining the additional depth of manhole to be paid for at the unit price bid per vertical foot, manholes shall be measured from the invert of the pipe outlet to the top of the manhole frame and cover and recorded to the nearest 1/10 of a foot.

Where more than one type or size (diameter) designation is shown on the drawings, or called for in the special provisions, a separate bid item of the following form shall cover each:

- 1) Type (or Size) Manhole, per each.
- 2) Additional Depth of Manhole, per vertical foot.
- 3) Drop Manhole Connection, per vertical foot.

**Payment:** Doghouse manholes shall be paid for at the contract unit price bid for a 6 foot deep manhole on an each basis plus a unit price per vertical foot for all depths in excess of 6 feet deep, in 2-foot increments (e.g. 0 to 6', 6'-1" to 8'-0", 8'-1" to 10'-0", etc.). Price shall include furnishing and constructing manholes complete-in-place including excavation, base construction, complete invert forming in accordance with the standards and drawings, rubber boots if applicable, bedding stone, inside drops where they occur, furnishing and bolting castings to cone if applicable, gaskets, parging interior joints, vent pipe if required (see [standard detail 532.02](#)), grade adjustment and grade rings, if applicable (see [standard detail C06.03](#)), vacuum testing, backfill and compaction complete in every detail. See [standard details 532.04 and 532.05](#).

**Q. Manhole Frames and Covers – Standard and Watertight:**

**Measurement and Payment:** Not a pay item. The cost, setting, and final adjustment of the standard and watertight manhole frames and covers are covered under the cost of the manhole for the type manhole specified. See [standard details C06.01, C06.02 and C06.03](#).

**R. Manhole - Precast Concrete Riser Ring:**

**Measurement and Payment:** Not a pay item. The cost, setting, and final adjustment of manhole grade rings are covered under the cost of the manhole for the type of manhole specified. See [standard detail C06.03](#).

**S. Measurement of Sewer Pipe**

**Measurement:** Sewer pipe shall be measured from center to center of manholes and depth of cut from invert to original ground line at centerline. No deductions in length will be made for branches and appurtenances along the line. The Contractor must determine the original ground line immediately prior to any trench excavation.

It is the Contractor's responsibility to provide this information to the City within 24 hours of the beginning of the trench excavation activities.

**Payment:** Payment will be made at the contract unit price bid per linear foot as stated in the proposal for the type of pipe specified and shall include trench excavation (excluding rock and select fill), shoring or use of trench box, installation, pumping, backfilling, compaction, testing of failed trenches, disposal of excess material, pressure testing, and cleanup complete in place. Payment may be reduced for lines deviating from design grade in accordance with paragraph [1.3.3 H Collection System Design, Water and Sewer Design and Construction](#).

#### T. PVC Sewer Line

**Measurement:** See pay item [Measurement of Sewer Pipe](#).

**Payment:** See pay item [Measurement of Sewer Pipe](#).

#### U. Pump Stations

**Measurement:** Sanitary sewer lift stations shall be measured based on an each basis.

**Payment:** Sanitary sewer lift stations shall be paid for at the contract lump sum price bid based on the contract drawings. Payment shall cover complete installation including, but not necessarily limited to, auxiliary generator, fencing, access road, water tank pad, wetwell and valve vault, pumps, yard hydrant, graveled fenced enclosure, shower and eye wash station, water service and meter, electrical service, disconnect, and meter, area light, control panel, manufacturers start up, witness and operational test, operational manuals, a hut or building for self priming pumps if applicable, emergency backup pump valved connection, complete in place.

#### V. Testing:

**Not a pay item.** The associated work, materials and labor involved in testing sewer mains and manholes is considered incidental to the cost of the sewer main construction and shall be included in other bid items.

#### W. Tunneling:

**Measurement:** Tunneling will be measured by the linear feet of tunnel installed.

The tunneling method shall include any and all excavation including disposal of excavated material, shoring and bracing, any backfill, steel liner plates and bolts, ventilation system for workers, lagging, spiders, grout plugs, sand-cement grouting of voids, steel drain pipe, french drain, concrete paved invert, the ends seals, dewatering, clean up, restoration and any other work required for a complete in place installation.

**Payment:** Tunneling will be paid for at the contract unit price per linear foot for diameter installed by the tunneling cut, complete and acceptable in place. Payment will only be made upon acceptance by the City of Jacksonville and the Consulting Engineer that the tunnel is installed to the proper elevation and grade and ready for the installation of the designed carrier pipe without any additional compensation. Any deviations, errors, or unacceptable conditions noted by the City of Jacksonville

or the Jacksonville office of the North Carolina Department of Transportation (if applicable) will be the responsibility of the Contractor to correct to the satisfaction of the above-mentioned parties. Unit price does not include the carrier pipe.

- X. **Other:** Other items shall be paid for as stated in the Proposal.

#### 1.4 STORM DRAINAGE

##### A. Catch Basins and Drop Inlets (Precast or Block):

**Measurement:** Precast or block catch basins and drop inlets will be measured on an each basis for the specified size and depth shown on the plans.

**Payment:** Precast or block catch basins and drop inlets will be paid for at the contract unit price per each for the specified size and depth shown on the plans. Price shall include all labor, material, and equipment necessary for installation, pouring of concrete invert, invert forming, iron castings, and mortaring of required components, complete in place.

##### B. Flared End Section:

**Measurement:** Flared end section, will be measured on an each basis.

**Payment:** Flared end section will be paid for at the contract unit price per each of the size indicated on the drawings and shall include all equipment, labor, materials for installation, excavation, backfill, stone if required, sealing and mortaring, complete in place.

##### C. Head/Endwalls:

**Measurement:** Head/endwalls will be measured on an each basis.

**Payment:** Head/endwalls will be paid for at the contract unit price per each of the size and type indicated on the drawings and shall include all equipment, labor, materials for installation, excavation, weep holes, shoring removal and replacement, curing, finishing, backfill, sealing and mortaring, complete in place.

##### D. Manholes - Standard:

**Measurement:** Storm drainage manholes shall be measured on an each basis for the specified diameter and depth shown on the plans.

**Payment:** Standard manholes will be paid for at the contract unit price for the specified diameter and depth shown on the plans, complete in place. Price shall include excavation, bedding stone, complete invert pouring and forming of concrete in accordance with the standard details and drawings, iron castings, concrete grade rings (if required), gaskets, backfill, and compaction, etc.

##### E. Manhole Frames and Covers – Standard:

**Measurement:** Manhole frames and covers are considered incidental to the cost of the precast structure on which it will be placed. .

**Payment:** Not a pay item.

**F. Manhole, Abandonment:**

**Measurement:** Manhole abandonment will be measured on an each basis.

**Payment:** Manhole abandonment will be paid for at the contract unit price per each, complete in place, in accordance with [Division 02530 - Sanitary Sewer](#).

**G. Rip Rap, Dry:**

**Measurement:** Dry rip rap will be measured by the square yard.

**Payment:** Dry rip rap will be paid for at the contract unit price per square yard of the size as indicated on the drawings and shall include all materials (including geotextile fabric), labor, and equipment necessary for a complete in place installation.

**H. Rip Rap, Grouted:**

**Measurement:** Grouted rip rap will be measured by the square yard.

**Payment:** Grouted rip rap will be paid for at the contract unit price per square yard of the size as indicated on the drawings, with the top 6 inches grouted, and shall include all materials (including geo-textile fabric), labor, and equipment necessary for a complete in place installation.

**I. Storm Pipe, Reinforced and Plain Concrete:**

**Measurement:** Storm pipe will be measured from the exact beginning of the pipe to the end of the pipe for the size and class pipe specified.

**Payment:** Storm pipe will be paid for at the contract unit price per linear foot for pipe of the wall thickness, class, and pipe size specified, complete in place. This price shall include pipe, trench excavation (excluding rock), stone bedding if specified, shoring or use of trench box, installation, pumping, joint compound, backfilling (excluding select fill), compaction, and disposal of excess material.

**J. Storm Pipe, Corrugated Aluminum Pipe:**

**Measurement:** Storm pipe will be measured from the exact beginning of the pipe to the end of the pipe for the size and type of pipe specified.

**Payment:** Storm pipe will be paid for at the contract unit price per linear foot for pipe of the wall thickness and/or gauge, coating, material, and pipe size specified, complete in place. This price shall include pipe, bands, gaskets, cutting and trimming, trench excavation (excluding rock), stone bedding if specified, paved invert (if applicable), shoring or use of trench box, bracing crown (if required) installation, pumping, backfilling (excluding select fill), compaction, and disposal of excess material.

**K. Other:** Other items shall be paid for as stated in the Proposal.

## 1.5 EARTHWORK

### A. Geotextile Stabilization Fabric

**Measurement:** Geotextile stabilization fabric will be measured in square yards based on surface measurements of material installed. Material waste will not be included in the measurement.

**Payment:** Geotextile stabilization fabric will be paid for at the contract unit price bid in square yards for the type of material specified on the plans or by the Public Services Director and shall include all labor, equipment, materials, lapping, seaming if applicable, waste disposal, etc. necessary for a complete in place installation.

### B. Offsite Borrow:

**Measurement:** Off-site borrow will be measured in its original position by cross sectioning the area excavated for borrow. The number of cubic yards will be computed from cross section measurements by the average end method. When it is impractical to measure the borrow, and if approved by the Public Services Director, truck tally measurements will be made in accordance with paragraph A of [Section 3.11 – Method of Volume Measurement, Division 02200 - Earthwork](#).

**Payment:** Off-site borrow will be paid at the contract unit price per cubic yard for material placed, compacted, and complete in place, including all excavation, loading, hauling, erosion control of borrow source, placement, spreading and compaction of borrow material.

C. **Onsite Borrow:** Material obtained from the site by cut and fill areas or other areas onsite that are designated to be used as borrow material is not a pay item for material but payment will be made by regular excavation.

### D. Regular Excavation:

**Measurement:** Regular excavation will be measured in its original position by cross sectioning the excavation area. The number of cubic yards will be computed from cross section measurements by the average end method. When it is impractical to measure by cross-section method, other acceptable methods, involving three-dimensional measurements may be used if approved by the Public Services Director.

In cut sections, excavation of topsoil and root mat and material down to subgrade elevation or to a point of 1 foot below the top of existing natural grade or to the depth specified on the plans, whichever is greater, will be measured as regular excavation. When areas of unsuitable material are shown on the plans, excavation 1 foot below the elevation of such material shown on the plans will be measured as regular excavation.

In fill sections, excavation of topsoil and root mat and material down to subgrade elevation or to an elevation of 1 foot below the bottom of topsoil and root mat, whichever is greater, will be measured as regular excavation. When areas of unsuitable material are shown on the plans, excavation down to a point 1 foot below the elevations of such material shown on the plans will be measured as regular excavation.

**Payment:** Regular excavation will be paid at the contract unit price per cubic yard of excavation and shall include all labor, equipment, and material required, complete in place, including all excavation, loading, moving of cut and fill material, placement, spreading and compaction of material.

**E. Rock Excavation:**

**Measurement:** Rock excavation will be measured by the Public Services Director or his representative in its original position, after which the rock shall be excavated to the depth specified by the Public Services Director and then measured by the cubic yard. Rock excavation shall consist of the removal and satisfactory disposal of all materials, which in the opinion of the Engineer, cannot be excavated except by drilling, blasting, "jack hammering or hoe ramming." No payment shall be made for rock removal by ripping. It shall consist of undecomposed stone, hard enough to ring under hammer. All boulders containing a volume of more than ½ cubic yard will be classified as rock.

**Payment:** Rock excavation will be paid for at the contract unit price per cubic yard for rock excavation and shall include all labor, materials, insurance, mats, signage, traffic control, storage containers, and equipment to excavate and dispose of rock off site.

**F. Undercut Excavation:**

**Measurement:** The material shown on the plans as undercut excavation or determined by the Public Services Director to be unsuitable and designated as undercut excavation and not included in regular excavation will be measured by cross sectioning the undercut area. The number of cubic yards will be computed by average end method. When it is impractical to measure by cross-section method because of erratic locations of isolated deposits, other acceptable methods, involving three-dimensional measurements may be used if approved by the Public Services Director.

Removal and satisfactory disposal of all unsuitable material located below subgrade elevation or 1 foot below the top of the existing natural grade, whichever is greater, 1 foot below the elevation of unsuitable material shown on the plans, or 1 foot below original ground in fill sections where topsoil and root mat are not required to be removed, will be measured as undercut excavation.

**Payment:** Undercut excavations will be paid for at the contract unit price per cubic yard for undercut excavation and shall include all labor, equipment, and material required, complete in place, including all excavation and disposal of material.

**G. Unclassified Excavation for Widening of Pavement:**

**Measurement:** Unclassified excavation for widening of pavement along existing paved areas and removal of existing paved areas will consist of the removal and satisfactory disposal of all materials except solid rock and concrete structures necessary for the construction of street widening projects including sidewalk and curb and gutter projects. Measurement will be made by cross sectioning the widened area. The number of cubic yards will be computed by average end method. No payment for materials removed without authorization from the Public Services Director or beyond the lines and grades set by the Public Services Director.

**Payment:** Unclassified excavation for pavement widening will be paid for at the contract unit price per cubic yard for unclassified excavation for widening of pavement. The price shall include all labor, equipment, and materials, including sawing or cutting the existing pavement or concrete, excavation of and disposal of material, preparing the grade, etc., complete in place.

#### H. **Unclassified Excavation for Removal of Existing Concrete Structures:**

**Measurement:** Unclassified excavation for removal of existing concrete structures shall consist of the removal and satisfactory disposal of all materials in concrete structures that may be designated for removal by the Public Services Director or shown to be removed on plans. These structures shall include sidewalks, steps, retaining walls, concrete pavement, and other minor structures; measured by the cubic yard in terms of material removed from its original positions. No payment for materials removed without authorization from the Public Services Director or beyond the lines and grades set by the Public Services Director.

**Payment:** Unclassified excavation for removal of existing concrete structures will be paid for at the contract unit price per cubic yard for unclassified excavation for the type listed. The price shall include all labor, equipment, and materials necessary to remove and dispose of, off site, any required structures, complete in place, including sawing or cutting the existing concrete if required.

#### I. **Other: Other items shall be paid for as stated in the Proposal.**

### 1.6 **BASE COURSE & PAVING**

#### A. **Adjusting Manholes and Valves for Resurfacing:**

**Measurement:** Manhole and valve box adjusting will be measured on an each basis for the type of structure adjusted.

**Payment:** Manhole and valve box adjusting by the method of removing and adjusting the frame and cover. Manholes shall be adjusted as shown on **standard detail C06.03**. Manhole and valve box adjustments will be paid for at the contract unit price per each for adjusting manholes and valves, and shall include all labor, equipment, materials (inclusive of concrete grade rings for manholes), feathering asphalt to castings if necessary, etc. for a complete in place installation.

#### B. **Aggregate Base Course:**

**Measurement:** Aggregate base course will be measured in square yards of the thickness as shown on the plans (or in tons, only if approved by the Public Services Director). When the ton unit is specified, the quantity shall be determined on scales equipped with a dial and an automatic printer, all of which have been approved and sealed in accordance with Section 106-7, *Scales and Public Weighmaster*, NCDOT *Standard Specifications for Roads and Structures*, latest revision.

**Payment:** The unit price bid shall include all labor, tools, equipment, and material necessary to complete the work and shall include, but is not necessarily limited to, saw cutting the pavement if necessary, adjusting valves and manholes, and meeting density requirements. Payment will be made per square yard of surface covered. Core samples shall be taken by the Contractor in areas directed by the City. The

average depth of the asphalt will be determined from these samples. The unit price paid will be reduced proportionately for each 1/8 inch thickness below the specified thickness. Thicknesses less than 75% of that specified shall receive an additional overlay at the minimum depth recommended by NCDOT for the type of asphalt specified for this project. No additional payment will be made for thicknesses greater than that designed.

**C. Asphalt Concrete Pavement:**

**Measurement:** Asphalt concrete pavement shall be measured in square yards of the type specified as evidenced by area of asphalt installed. Measurement for all roadways will be based on plan quantities and field measurement, not tonnage tickets.

**Payment:** Asphalt concrete pavement will be paid for at the contract unit price bid per square yard for the type of asphalt concrete specified. This price shall be full compensation for asphalt concrete pavement, complete in place, including all materials, labor, tools, equipment, tack coat, maintenance of traffic, and all other incidentals necessary. Adjusting manholes, cleanouts, valve boxes, etc. will be paid separately at the bid price for each when adjusted by the Contractor. Payment will be made per square yard of surface covered. Core samples shall be taken by the Contractor in areas directed by the City. The average depth of the asphalt will be determined from these samples. The unit price paid will be reduced proportionately for each 1/8 inch thickness below the specified thickness. Thicknesses less than 75% of that specified shall receive an additional overlay at the minimum depth recommended by NCDOT for the type of asphalt specified for this project as the surface course. No additional payment will be made for thicknesses greater than that designed

**D. Asphalt Concrete Paved Flumes, Walks, etc.:**

**Measurement:** Asphalt concrete paved flumes, walks, etc. will be measured in square yards for a depth of 4 inches.

**Payment:** Asphalt concrete paved flumes, walks, etc. will be paid for at the contract unit price bid in square yards for a depth of 4 inches and shall be installed in accordance with applicable NCDOT details and specifications, including all labor, equipment, and materials necessary for a complete in place installation.

**E. Asphalt Surface Treatment:**

**Measurement:** Per square yard of area covered.

**Payment:** Asphalt surface treatment will be paid per square yard of area covered. This price shall include all labor, equipment, and materials to furnish and install, complete in place.

**F. Foundation Stone:**

**Measurement:** Foundation stone for roadways will be measured by the cubic yard of foundation stone placed.

**Payment:** Foundation stone, if approved by the Public Services Director, will be paid for at the contract unit price for foundation stone by the cubic yard. Price shall

include removal and disposal of unusable material and placement of stone, complete in place.

**G. Manhole Adjustment for Resurfacing:**

**Measurement:** Iron manhole riser adjusting rings are not permitted. Manhole frames and covers shall be raised with brick or concrete riser rings only and measured per manhole.

**Payment:** Manhole adjustment , as shown on [standard detail C06.03](#), will be paid at the contract unit price per manhole and shall include all labor, material, and equipment necessary to raise the existing frame.

**H. Manhole and Valve Box Replacement for Resurfacing:**

**Measurement:** Manhole and valve box replacement will be measured on an each basis for the type of frame installed.

**Payment:** Manhole and valve box replacement for resurfacing will be paid on an each basis for the type of frame installed at the contract unit price and shall include all labor, material, and equipment necessary to remove and install a new frame, complete in place.

**I. Pavement Repair or Street Rehab:** This item shall cover pavement repair in areas where it becomes necessary to remove and replace the existing pavement in failed areas or areas where patching is required as part of roadway work or in locations as otherwise requested by the Public Services Director.

**Measurement:** Work and materials for pavement repair will be measured in the following manner.

- 1) **Unclassified excavation for pavement repair** will be measured in cubic yards of pavement, temporary maintenance stone, or other unclassified material removed.
- 2) **Aggregate base stone for pavement repair** will be measured in square yards, generally 8 inches deep, but thickness shall be as shown on the plans or as directed by the Public Services Director.
- 3) **Asphalt base (B 25.0X) for pavement repair** will be measured in square yards, generally 4 inches deep, but thickness shall be as shown on the plans or as directed by the Public Services Director.
- 4) **Asphalt surface (S9.5B) for pavement repair** will be measured in square yards generally 2" deep, but thickness shall be as shown on the plans or as directed by the Public Services Director.
- 5) **Surface treatment for surface treated pavement repair** will be measured in square yards.
- 6) **Temporary pavement repair** will be measured in terms of square yards consisting of a combination of material as defined in these specifications.

**Payment:** Work and materials for pavement repair will be paid for in the following manner.

- 1) **Unclassified excavation for pavement repair** will be paid for at the contract unit bid price per cubic yard. This price shall include all labor, equipment, and material to saw-cut, excavate, remove and dispose of material, and all work and grading to prepare the surface for paving, complete in place.
- 2) **Aggregate base stone for pavement repair** will be paid for at the contract unit price bid per square yard generally 8 inches deep, but thickness shall be installed according to the plans for ABC. This price shall include all labor, equipment, and material necessary to furnish and install the stone, complete in place.
- 3) **Asphalt base (B 25.0X) for pavement repair** will be paid for at the contract unit price bid per square yard (generally 4 inches deep) for the type of base mix as shown on the plans or as directed by the Public Services Director. This price shall include all labor, materials, and equipment, including tack, necessary to furnish and install the asphalt, complete in place. Payment will be made per square yard of surface covered. Core samples shall be taken by the Contractor in areas directed by the City. The average depth of the asphalt will be determined from these samples. The unit price paid will be reduced proportionately for each 1/8 inch thickness below the specified thickness. Thicknesses less than 75% of that specified shall receive an additional overlay at the minimum depth recommended by NCDOT for the type of asphalt specified for this project. No additional payment will be made for thicknesses greater than that designed.
- 4) **Asphalt surface (S9.5B) for pavement repair** will be paid for at the contract unit price bid per square yard for a particular thickness and type as shown on the plans or as directed by the Public Services Director. This price shall include all labor, materials, and equipment, including tack, necessary to furnish and install the asphalt, complete in place. Payment will be made per square yard of surface covered. Core samples shall be taken by the Contractor in areas directed by the City. The average depth of the asphalt will be determined from these samples. The unit price paid will be reduced proportionately for each 1/8 inch thickness below the specified thickness. Thicknesses less than 75% of that specified shall receive an additional overlay at the minimum depth recommended by NCDOT for the type of asphalt specified for this project as the surface course. No additional payment will be made for thicknesses greater than that designed.
- 5) **Surface treatment for surface treated pavement repair** will be paid for at the contract unit price bid per square yard for surface treatment for pavement repair. This price shall be full compensation for one prime coat and two seal coats, complete in place.
- 6) **Temporary pavement repair** will be paid for at the contract unit price bid per square yard for temporary pavement repair. This price shall include aggregate stone to the depth specified on the plans, seal coat, and cold patch, as defined in these specifications and all labor, materials and equipment necessary, complete in place.

**J. Pavement Profiling - Milling:**

**Measurement:** Pavement profiling will be measured in square yards for each 1 inch depth of material profiled and removed.

**Payment:** Pavement profiling will be paid for at the contract unit price bid per square yards per 1 inch depth and shall include all labor, materials, and equipment necessary to remove and dispose of the material, complete in place.

**K. Petro-mat, or approved equal:**

**Measurement:** Petro-mat, or approved equal, will be measured in square yards based on surface measurements of area covered.

**Payment:** Mat will be paid for at the contract unit price bid in square yards for the type of material specified in these specifications and shall include all labor, equipment, and materials necessary for a complete in place installation.

**L. Portland Cement Treated Aggregate:**

**Measurement:** Portland cement treated aggregate will be measured in square yards of material with thickness as shown on the plans or as directed by the Public Services Director.

**Payment:** Portland cement treated aggregate will be paid at the contract unit price bid for square yards with thickness as shown on the plans or as directed by the Public Services Director. This price shall include all material, equipment, and labor required to furnish and install the Portland cement treated aggregate, complete in place.

**M. Prime Coat:**

**Measurement:** Liquid asphalt material will be measured by the gallon.

**Payment:** Liquid asphalt material will be paid for at the contract unit price bid per gallon. This price shall include all labor, equipment, and materials to furnish, install, and maintenance of the treatment until surface course is applied, complete in place.

**N. Tack Coat: (Not a pay item, incidental to other items bid)**

**1.7 CURB & GUTTER, DRIVEWAYS, SIDEWALKS, AND MISCELLANEOUS CONCRETE ITEMS**

**A. New Concrete Sidewalk, 4 inches thick:**

**Measurement:** New sidewalk shall be measured per linear foot of finished concrete at the width and depth specified in the contract.

**Payment:** New sidewalk shall be paid for at the contract unit price bid per linear foot of finished concrete. This price shall include all labor, equipment, and material for excavation, backfilling, expansion joint material, formwork, finishing, curing, etc. for a complete in place installation, as shown on [standard detail 404.03](#) and installed at the locations as shown on the construction drawings and/or as directed by the Public Services Director.

**B. Replacement of Concrete Sidewalk:**

**Measurement:** Replacement of sidewalk will be measured per linear foot of finished concrete.

**Payment:** Replacement of sidewalk will be paid for at the contract unit price bid per linear foot at a depth specified in the contract. This price shall include all labor, equipment, and material for excavation, removal and disposal of existing sidewalk, backfilling, expansion joint material, formwork, finishing, curing, etc. for a complete in place installation as shown on [standard detail 404.03](#) and installed at the locations as shown on the construction drawings and/or as directed by the Public Services Director.

**C. New Concrete Driveways and Entrances:**

**Measurement:** New concrete driveways and entrances per design thickness will be measured in square yards of finished concrete.

Driveways formed in conjunction with standard curb, and curb and gutter, shall be measured in square yards as follows:

- 1) In length as shown on [standard details 404.01 and 404.02](#) as applicable.
- 2) In width from the back edge of the driveway to the back edge of the curb extended.

**Payment:** New concrete driveways and entrances will be paid for at the contract unit price bid per square yard at a depth as specified in the design. This price shall include all labor, equipment, and material for excavation, backfilling, expansion material, formwork, finishing, curing, etc. for a complete in place installation, as shown on [standard details 404.01 and 404.02](#) and installed at the locations as shown on the construction drawings and/or as directed by the Public Services Director.

**D. Replacement of Concrete Driveways and Entrances:**

**Measurement:** Replacement of concrete driveways and entrances will be measured in square yards of finished concrete.

Driveways formed in conjunction with standard curb, and curb and gutter, shall be measured in square yards as follows:

- 1) In length as shown on [standard details 404.01 and 404.02](#) as applicable.
- 2) In width from the back edge of the driveway to the back edge of the curb extended.

**Payment:** Replacement of concrete driveways and entrances will be paid for at the contract unit price bid per square yard at depth as specified in the design. This price shall include all labor, equipment, and material for excavation, removal and disposal of existing concrete, backfilling, expansion material, formwork, finishing, curing, etc.

for a complete in place installation as shown on [standard details 404.01 and 404.02](#) and installed at the locations as shown on the construction drawings and/or as directed by the Public Services Director.

**E. New Concrete Curb and Gutter, City Standard:**

**Measurement:** New concrete curb and gutter, City standard will be measured per linear foot along the face of the curb for the entire length of the work including portion of curb shaped for handicap ramps and through driveways for the type curb and gutter installed.

**Payment:** New concrete curb and gutter, City standard will be paid for at the contract unit price per linear foot and shall include all labor, equipment, and material for excavation, formwork, stone bedding, backfilling, expansion material, finishing, curing, etc. for a complete in place installation as shown on the [standard detail 402.01](#) and installed at the locations as shown on the construction drawings and/or as directed by the Public Services Director.

**F. Replacement of Concrete Curb and Gutter, City Standard:**

**Measurement:** Replacement of concrete curb and gutter, City standard will be measured per linear foot along the face of the curb for the entire length of the work including portion of curb shaped for handicap ramps and through driveways for the type of curb and gutter installed.

**Payment:** Replacement of concrete curb and gutter will be paid for at the contract unit price bid per linear foot. This price shall include all labor, equipment, and material for excavation, removal and disposal of existing concrete, backfilling, stone bedding, expansion material, formwork, finishing, curing, etc. for a complete in place installation as shown on [standard detail 402.01](#) and installed at the locations as shown on the construction drawings and/or as directed by the Public Services Director.

**G. Vertical Concrete Curb:**

**Measurement:** Vertical concrete curb will be measured in linear feet along the face of the curb including handicap ramps and driveway openings.

**Payment:** Vertical concrete curb will be paid in linear foot the contract unit price for 6"X12" curb. Prices shall include all labor, equipment, and material for excavation, formwork, stone bedding, backfilling, expansion joint material, finishing, curing, etc. for a complete in place installation and installed at the locations as shown on the construction drawings and/or as directed by the Public Services Director.

**H. Concrete Handicap Ramp:**

**Measurement:** Concrete handicap ramps will be measured per ramp.

**Payment:** Concrete handicap ramps will be paid for at the contract unit price bid per ramp. This price shall include all labor, equipment, and material for excavation, removal and disposal of existing concrete, backfilling, stone bedding, expansion

material, formwork, finishing, detectable warning surface, curing, etc. for a complete in place installation as shown on the standard details and installed at the locations as shown on the construction drawings and/or as directed by the Public Services Director.

**I. Formed Concrete for Retaining Walls, Piers, Steps, and other misc. Concrete Structures:**

**Measurement:** Formed concrete for retaining walls, piers, steps, and other misc. concrete structures will be measured per structure specified on the drawings or applicable details.

**Payment:** Formed concrete for retaining walls, piers, steps, and other misc. concrete structures will be paid for at the contract unit price bid per structure, complete in place. All backfilling will be included in bid price for concrete. Payment will be made only for the quantities and dimensions as shown on drawings or applicable details.

**J. Concrete Paved Ditches:**

**Measurement:** Concrete paved ditches will be measured per square yard of paved ditch based on measurements as defined on the applicable details or construction drawings, at the thickness specified

**Payment:** Concrete paved ditches will be paid for at the contract unit price per square yard and shall include all labor, equipment, and material for excavation, formwork, stone bedding, backfilling, expansion material, finishing, curing, etc. for a complete in place installation and installed at the locations as shown on the construction drawings and/or as directed by the Public Services Director, at the thickness specified.

**K. Tree Well in Sidewalk :**

**Measurement:** Tree wells will be measured on an each basis.

**Payment:** Tree wells will be paid for at the contract unit price per each and shall include all labor, equipment, and materials to install the tree well, complete in place.

**L. Concrete Wheel Bumpers:**

**Measurement:** Concrete wheel bumpers will be measured on an each basis.

**Payment:** Concrete wheel bumpers will be paid for at the contract unit price per each and shall include all labor, equipment, and materials to install the wheel block, complete in place.

**1.8 ITEMS MISCELLANEOUS TO ALL SECTIONS**

**A. Clearing and Grubbing Wooded Areas:**

**Measurement:** Measurement for clearing and grubbing will be by the acre. The disturbance shall not exceed width as defined in the construction limits criteria.

**Payment:** Price per acre for clearing and grubbing in wooded areas shall include all material, equipment, and labor required to clear and grub wooded areas in accordance with these specifications. The price shall also include the removal and disposal of items.

**B. Construction Entrance**

**Measurement:** Construction entrance for erosion control will be measured on an each basis. Size and depth of stone shall be based on the dimensions, type and depth of stone as specified in the NCDENR, Land Quality Section *Erosion and Sediment Control Planning and Design Manual*, and latest revision.

**Payment:** Construction entrance for erosion control will be paid for at the contract unit price per each and shall include all materials, stone, including Geotextile fabric, labor, and equipment necessary for a complete in place installation as well as maintenance.

**C. Flowable Fill Concrete:**

**Measurement:** Measurement shall be by the cubic yard of concrete placed, regardless of the specified strength.

**Payment:** Paid for in place by the cubic yard.

**D. Silt Fence Barrier:**

**Measurement:** Silt fence barrier for erosion control will be measured by the linear foot.

**Payment:** Silt fence barrier for erosion control will be paid for at the contract unit price per linear foot and shall include all material, labor, and equipment necessary for a complete in place installation. The price shall also include the removal, maintenance, and disposal of silt fence upon stabilization of ground cover.

**E. Sodding, Fertilizing, Seeding and Fine Grading:**

**Measurement:** Measurement of surfaces to be sodded or seeded shall be measured to the nearest square yard for the class specified. Sodding, fertilizing, seeding, and fine grading shall be provided as described section in [Division 02275 - Trenching, Backfilling, and Compaction of Utilities](#). Extra compensation will not be made for additional seeding beyond all limits of construction as defined in applicable section.

**Payment:** Payment for sodding, fertilizing, seeding, and fine grading will be at the contract unit price square yard for sodding, fertilizing, seeding, and fine grading as described in [Division 02275 - Trenching, Backfilling, and Compaction of Utilities](#). No compensation will be made for reseeding, if required. The cost of restoring areas located beyond the designated area(s) shall be borne by the Contractor.

**F. Temporary Access or Haul Roads**

**Measurement:** Any grading or excavation required for equipment travel during the course of construction as well as erosion control, removal, restoration, seeding and ground cover shall be included in other items bid.

**Payment:** Included in other items bid. Not a pay item.

**G. Traffic Control:**

**Not a pay item.** The associated work, materials, and labor involved in traffic control are incidental to the cost of construction and shall be included in other bid items.

**H. Undercut Excavation:**

**Measurement:** The material shown on the plans as undercut excavation or determined by the Public Services Director to be unsuitable and designated as undercut excavation, and not included in regular excavation, will be measured by cross sectioning the undercut area. The number of cubic yards will be computed by average end method. When it is impractical to measure by cross-section method because of erratic locations of isolated deposits, other acceptable methods, involving three-dimensional measurements may be used if approved by the Public Services Director.

Removal and satisfactory disposal of all unsuitable material located below subgrade elevation or 1 foot below the top of the existing natural grade, whichever is greater, 1 foot below the elevation of unsuitable material shown on the plans, or 1 foot below original ground in fill sections where topsoil and root mat are not required to be removed, will be measured as undercut excavation.

**Payment:** Undercut excavations will be paid for at the contract unit price per cubic yard for undercut excavation and shall include all labor, equipment, and material required, complete in place, including all excavation and disposal of material.

**END OF SECTION 00950**

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