

## **SECTION 0010 - GENERAL TECHNICAL PROVISIONS**

### **PURPOSE**

These Technical Specifications ("Specifications") are adopted by the City of Lawrence, Kansas to provide minimum construction standards to safeguard the public welfare by regulating and controlling construction and the quality of materials; to promote uniformity and clarity of intent; and to encourage standardization.

### **SCOPE**

Alternative Materials, Processes and Equipment: The provisions of these Specifications are not intended to prevent the installation of any material or to prohibit any construction process or equipment not specifically prescribed by these Specifications. Alternative materials, processes or equipment may be approved provided the material or work offered is, for the purpose intended, at least the equivalent in quality, strength, effectiveness, durability and safety to that prescribed by these Specifications as determined by the Department of Public Works. All deviations must be approved in writing by the Engineer.

Specific sections of the Kansas Department of Transportation Standard Specifications for State Road and Bridge Construction ("KDOT Standards") are referenced throughout. These specific sections are hereby made a part of these specifications.

### **GENERAL REQUIREMENTS**

Protection of Property Pins and Monuments. The contractor shall be responsible for the protection and preservation of all property pins and monuments. Prior to the beginning of construction, the contractor shall locate and record the location of all such property pins and monuments and shall erect suitable markers and barricades to protect said pins and monuments. After the construction is complete and before final payment is made by the City, the contractor shall account for all pins and monuments that existed prior to construction and shall have replaced any such pins or monuments which have been damaged or destroyed without the permission of the Engineer. The replacement of any pins or monuments shall be by a surveyor licensed in the state of Kansas and acceptable to the City.

Utilities Encountered. Utility lines and facilities are located on the plans based upon the best information available. The actual location of these facilities is the responsibility of the Contractor and should any such facilities have to be relocated, it shall be the responsibility of the contractor to give adequate notice to do so to the respective utility company.

Traffic Control. All construction areas shall have adequate traffic control devices in accordance with the following.

1. All traffic control devices shall conform to applicable sections of the current edition of the Manual on Uniform Traffic Control Devices (MUTCD). This includes signs, signals, lighting devices, markings, barricades, and channelizing and hand signaling devices.
2. Specific traffic control plans shall be reviewed and approved by the Engineer prior to beginning any work.
3. The Contractor shall be responsible for notifying City departments including police, fire/medical and transit, and the school district if work is to be done while school is in session, before closing any street.
4. Notice of all revisions to planned or in-place traffic control shall be given to the City and other agencies 48 hours in advance of making changes.
5. The Contractor shall furnish and maintain adequate signs, barricades, warning lights, and all other necessary equipment in accordance with the MUTCD. The Contractor will be responsible for redirecting traffic and providing flaggers as required.

Environmental Compliance. Contractor shall be responsible for conducting all work in compliance with city, state and federal environmental regulations. Erosion control measures and practices shall conform to the approved Kansas Department of Health and Environment (KDHE) National Pollutant Discharge Elimination System (NPDES) permit and the approved Stormwater Pollution Prevention Plan (SWP3) for the project. No direct discharge of water used for washout, cleanup or other construction processes shall be allowed into the storm drainage system. Inlet protection, designated ponding and settling areas, or other best management practices shall be used to prevent contaminated runoff from entering the drainage system.

Access to Adjacent Properties. When access to adjacent property is required to be maintained during construction, the Contractor shall be responsible for providing and maintaining temporary surfacing to each location to be accessed for the duration of the work. Unless otherwise indicated in the drawings or specifications, temporary surfacing shall be crushed rock, gravel or other approved materials. Material shall be supplemented or replaced as needed to maintain required access. Once permanent access has been restored or provided, all temporary surfacing material shall be removed from the site and the area restored to pre-construction conditions.

Temporary Facilities. Contractor shall provide portable toilets on the project site. Contractor shall be responsible for providing temporary field offices and sheds, job trailers, and temporary utilities as required for performance of the work. An on-site field office is not mandatory unless specified in the Project Special Provisions and/or included in the proposal.

Site Maintenance. The Contractor shall be responsible for maintenance of the site for the duration of the work. Contractor shall execute periodic cleaning to keep the Work, site and adjacent properties free from accumulations of waste materials, rubbish and windblown debris resulting from construction operations.

Provide sufficient onsite containers for the collection of waste materials, debris and rubbish. Containers shall be clearly marked with the Contractor's name and shall be conveniently located for use by workers. Refuse containers shall be covered to prevent wind from removing debris, and Contractor shall relocate containers as required during the course of the Work for convenient use by workers.

Construction debris includes, but is not limited to, excess dirt, rock, pavement materials, concrete splatters, overspray, and oil tracking from the area of the construction. The debris removed on this project becomes the property of the Contractor and must be hauled off site.

Contractor shall not allow concrete trucks to washout on the project site, in curb inlets and storm sewers, or on adjacent or nearby properties unless an approved washout area has been provided. All material in the washout area shall be removed at the end of construction and the area restored to original condition. If no washout area is provided concrete trucks must return to the plant before washing out. Concrete trucks that do not observe restrictions on washout may be prohibited from further deliveries to the project site.

The Contractor shall be responsible for keeping trucks and equipment clean for the duration of the Contract. If mud is deposited as a result of any of the Contractor's actions on any paved area, the Contractor will remove the mud immediately after being notified by the Engineer.

Contractor Employee Conduct: Contractor's personnel shall not use sanitary facilities or utility services on adjacent or nearby private property without specific written permission from the property owner. Any worker observed not using portable toilet facilities provided on the site will be removed from the project. Contractor's personnel must not take breaks or eat lunch on adjacent private property.

## MEASUREMENT AND PAYMENT

The Work of this Contract consists of furnishing all equipment, labor, material, and incidentals required, and performing all construction, installation and testing of all improvements, modifications and additions, all as shown on the drawings and detailed in the specifications. The term "all costs", as used in the payment descriptions is defined as full compensation for all equipment, labor, material and incidental costs.

Measurement and payment shall be as specified in this Section. All work shown on the drawings or detailed in the specifications and not specifically set forth in the Itemized Proposal as a pay item shall be considered a subsidiary obligation

of the contractor, and all costs in connection therewith shall be included in the prices named in the proposal.

Items not listed in this Section but included in the Proposal shall be paid for based on the plan quantities and at the unit prices indicated in the Proposal unless otherwise specified in the Project Special Provisions.

### Bid Items

#### 1. Demolition And Removal

- a. Final measurement will not be made. Contract quantity shall be plan quantity unless changes to the bid quantity are authorized.
- b. Payment for demolition and removal shall be based on the lump sum price as set forth in the Proposal. Said price shall include all costs necessary to complete the work including, but not limited to, demolishing, removing, disposing, plugging and capping of all structures and improvements, such as existing pavement, curb, sidewalk, pipes and structures (such as sanitary, storm and water) fences, poles and footings, within the construction limits, unless included in other items of work, as required by the drawings and specifications.

#### 2. Clearing And Grubbing

- a. Final measurement will not be made. Contract quantity shall be plan/bid quantity unless changes to the bid quantity are authorized.
- b. Payment for clearing and grubbing shall be based on the lump sum price as set forth in the Proposal. Said price shall include all costs necessary to complete the work including, but not limited to, demolishing, removing and disposing of all trees, shrubs, bushes, stumps and roots within the construction limits as required by the drawings and specifications.

#### 3. Excavation And Embankment

- a. Final measurement will not be made. Contract quantity shall be plan/bid quantity unless changes to the bid quantity are authorized.
- b. Payment for excavation and embankment shall be based on the unit price per cubic yard as set forth in the Proposal. Said price shall include all costs necessary to complete the work including, but not limited to, roadway grading, excavation of whatever material is encountered (earth, shale, limestone), borrow material, loading, hauling, placement, compacting, finish grading, subgrade preparation and reconstruction, topsoil removal and replacement (including

additional materials to sustain plant growth) and loading and hauling excess material as required by the drawings and specifications.

4. Subgrade Stabilization

- a. Final measurement will not be made. Contract quantity shall be plan/bid quantity unless changes to the bid quantity are authorized.
- b. Payment for stabilized subgrade shall be based on the unit price per square yard as set forth in the Proposal, per the type of material and thickness of the installed item. Said price shall include all costs necessary to complete the work including, but not limited to, placing, compacting, rolling and watering as required by the drawings and specifications.

5. Drainable Base

- a. Final measurement will not be made. Contract quantity shall be plan/bid quantity unless changes to the bid quantity are authorized.
- b. Payment for drainable base shall be based on the unit price per square yard as set forth in the Proposal, per the type of material and thickness of the installed item. Said price shall include all costs necessary to complete the work including, but not limited to, placing, compacting, rolling and watering as required by the drawings and specifications.

6. Drain Tile (Edge Drain Or Under Drain)

- a. Final measurement will be based on the horizontal length of the completed and installed item.
- b. Payment for edge drain shall be based on the unit price per linear foot as set forth in the Proposal, per the type and size of the installed item. Said price shall include all costs necessary to complete the work as required by the drawings and specifications. Note: Drain tile installed in retaining walls will be considered subsidiary to the wall pay item.

7. Asphalt Pavement

- a. Final measurement will be based either on the tonnage or the square yards of each type of asphalt used. The Project Special Provisions and bid form will indicate which option is to be used. When square yards are used asphalt tickets must still be submitted to the Engineer.
- b. Payment for asphalt pavement shall be based on the unit price per ton or square yard as set forth in the Proposal. Said price shall include all costs necessary to complete the work including, but not limited to, preparing surface, placing pavement, compacting, rolling, connecting to existing pavement, and sealing, as required by the drawings and specifications.

- c. Prices quoted for asphalt material will be based on the “Computed Monthly Asphalt Material Index” in effect for the month immediately preceding the month the project is bid as listed at <http://www.ksdot.org/burconsmain/ppreq/AsphaltPriceIndex.asp>. Hot mix asphalt provided/placed in a subsequent month will be adjusted \$0.50/ton for each \$10.00 increase/decrease in the Computed Monthly Asphalt Material Index, based on the initial price index shown for the month immediately preceding the month the project is bid. For example, if the project is bid in March then the initial price index would be based on the month of February of the same year. The asphalt material index is established on PG 64-22, and will be applied for all grades of asphalt cement oil.

Payment for oil price adjustments will be paid based on tonnage regardless of the method of measurement for in-place pavement.

The following table provides examples of possible adjustments, but does not limit any increases/decreases to only those shown in the table.

| Change in Price of Asphalt Oil/Ton (Asphalt Material Index) | Change/Adjustment in Bid Price of Combined Asphalt Mix/Ton |
|---|--|
| \$00.00 to \$ 9.99  | \$0.00   |
| \$10.00 to \$19.99  | \$0.50   |
| \$20.00 to \$29.99  | \$1.00   |
| \$30.00 to \$39.99  | \$1.50   |
| \$40.00 to \$49.99  | \$2.00   |

Adjustments to payments (increase or decrease) will be made for the applicable completed work. If the working days or calendar completion date for the work (or a specific portion of the work) expires, payments (or deductions) will continue to be applied, but the maximum adjustment for the rest of the project will be the adjustment for the month the contract time expired.

#### 8. Concrete Pavement

- a. Final measurement will be based on the square yard of the completed and installed item.
- b. Payment for concrete pavement shall be based on the unit price per square yard as set forth in the Proposal, per the type of pavement and thickness of the installed item. Said price shall include all costs necessary to complete the work including, but not limited to, placing, compacting, saw cutting, milling, doweling, jointing, curing and sealing, as required by the drawings and specifications

#### 9. Temporary Surfacing (Aggregate)

- a. Final measurement will be based on the tons of the completed and installed item.
- b. Payment for aggregate (crushed stone or gravel) shall be based on the unit price per ton as set forth in the Proposal. Said price shall include all costs necessary to complete the work, including but not limited to, hauling, grading, placing, tamping, removing, and restoring surfaces after removal as required by the drawings and specifications.

#### 10. Driveways

- a. Final measurement will be based on the square yard of the completed and installed item.
- b. Payment for driveways shall be based on the unit price per square yard as set forth in the Proposal, per the type of pavement and thickness of the installed item. Said price shall include all costs necessary to complete the work including, but not limited to, placing, compacting, saw cutting, milling, doweling, jointing, curing and sealing, as required by the drawings and specifications.

#### 11. Sidewalks and Recreation Paths

- a. Final measurement will be based on the square foot or yard of the completed and installed item.
- b. Payment for sidewalks and paths shall be based on the unit price per square foot or yard as set forth in the Proposal, per the type of pavement and thickness of the installed item. Said price shall include all costs necessary to complete the work including, but not limited to, placing, compacting, saw cutting, doweling, jointing, curing and sealing, as required by the drawings and specifications.

#### 12. Access Ramps

- a. Final measurement will be based on each completed and installed item.
- b. Payment for access ramps shall be based on the unit price per each as set forth in the Proposal. Said price shall include all costs necessary to complete the work including, but not limited to, subgrade preparation, placing, compacting, saw cutting, jointing, curing, sealing and installing detectable surface as required by the drawings and specifications.

#### 13. Curb And Gutter (All Types)

- a. Final measurement will be based on the horizontal length of the completed and installed item, as measured along the gutter line.
- b. Payment for curb and gutter shall be based on the unit price per linear foot as set forth in the Proposal, per the type of curb and gutter. Said price shall include all costs necessary to complete the work including, but not limited to, subgrade preparation, forming, placing, doweling,

jointing, deflector construction, finishing, curing and backfilling, as required by the drawings and specifications.

14. Flowable Fill/Mortar

- a. Final measurement will not be made. Contract quantity shall be plan/bid quantity unless changes to the bid quantity are authorized.
- b. Payment for flowable fill/mortar will be based on the unit price per cubic yard as set forth in the Proposal. Said price shall include all costs necessary to place the material and complete the work as required by the drawings and specifications.

15. Storm Sewer Structures (Inlets, Junction Boxes And Manholes)

- a. Final measurement will be based on each completed and installed item.
- b. Payment for storm sewer structures shall be based on the unit price per each as set forth in the Proposal, per the type and size of structure. Said price shall include all costs necessary to complete the work item including, but not limited to, all excavation (earth, rock, shale), bedding, placing or building structure, invert construction, structure to pipe connections, final grade adjustments to the top, sealing, curing, backfilling, compacting, grading and removal of excess or unsuitable material, as required by the drawings and specifications.

16. Storm Sewer Pipe (All Types)

- a. Final measurement will be based on the horizontal length of the completed and installed item, as measured along the centerline.
- b. Payment for storm sewer pipe shall be based on the unit price per linear foot as set forth in the Proposal, per the type and size of pipe. Said price shall include all costs necessary to complete the work item including, but not limited to, all excavation (earth, rock, shale), bedding, placing, pipe to pipe connections, sealing, backfilling, compacting, grading and removal of excess or unsuitable material, as required by the drawings and specifications.

17. Storm Sewer End Sections (All Types)

- a. Final measurement will be based on each completed and installed item.
- b. Payment for storm sewer end sections shall be based on the unit price per each as set forth in the Proposal, per the type and size of end section. Said price shall include all costs necessary to complete the work item including, but not limited to, all excavation (earth, rock, shale), bedding, placing or building the end section, end section to pipe connections, toe wall construction, sealing, curing, backfilling, compacting, grading and removal of excess or unsuitable material, as required by the drawings and specifications.

18. Rip Rap (All Types)

- a. Final measurement will be based on the square yard of the completed and installed item.
- b. Payment for rip rap shall be based on the unit price per square yard as set forth in the Proposal, per thickness of rip rap. Said price shall include all costs necessary to complete the work item including, but not limited to, filter fabric, all excavation (earth, rock, shale), backfilling, compacting, grading and removal of excess or unsuitable material, as required by the drawings and specifications.

19. Water Line Pipe (All Types)

- a. Final measurement will be based on the horizontal length of the completed and installed item, as measured along the centerline.
- b. Payment for water line pipe shall be based on the unit price per linear foot as set forth in the Proposal, per the type and size of pipe. Said price shall include all costs necessary to complete the work item including, but not limited to, all excavation (earth, rock, shale), dewatering, bedding, polyethylene encasement, placing, pipe to pipe connections, restraint measures, flushing, disinfection, pressure testing, backfilling, compacting, grading and removal of excess or unsuitable material, as required by the drawings and specifications.

20. Water Line Valves (All Types)

- a. Final measurement will be based on each completed and installed item.
- b. Payment for valves in water mains will be paid at the unit price per each size and type as set forth in the Proposal. Said price shall include, but not be limited to, furnishing and installing the valve, valve box, and appurtenances; excavation and backfill not included under piping; and all other costs not included under other bid items.

21. Water Line Fittings (Bends, Crosses, Reducers, Sleeves, Tees)

- a. Final measurement will be based on each completed and installed item.
- b. Payment for water line fittings shall be based on the unit price per each as set forth in the Proposal, per the type and size of fitting. Said price shall include all costs necessary to complete the work item including, but not limited to, all excavation (earth, rock, shale), dewatering, bedding, polyethylene encasement, placing, pipe to pipe connections, restraint measures, flushing, disinfection, pressure testing, backfilling, compacting, grading and removal of excess or unsuitable material, as required by the drawings and specifications.

22. Water Line Connections (Main Line Connections)

- a. Final measurement will be based on each completed and installed item.
- b. Payment for water line connections shall be based on the unit price per each as set forth in the Proposal. Said price shall include all costs necessary to complete the work item including, but not limited to, all excavation (earth, rock, shale), dewatering, bedding, polyethylene encasement, placing, pipe to pipe connections, restraint measures, flushing, disinfection, pressure testing, backfilling, compacting, grading and removal of excess or unsuitable material, as required by the drawings and specifications.

#### 23. Water Line Splice And Relocation

- a. Final measurement will be based on each completed and installed item.
- b. Payment for water line splice and relocation shall be based on the unit price per each as set forth in the Proposal. Said price shall include all costs necessary to complete the work item including, but not limited to, all excavation (earth, rock, shale), dewatering, bedding, polyethylene encasement, placing, pipe to pipe connections, restraint measures, valve box, flushing, disinfection, pressure testing, backfilling, compacting, grading and removal of excess or unsuitable material, as required by the drawings and specifications.

#### 24. Water Meter Removal And Abandonment

- a. Final measurement will be based on each completed and installed item.
- b. Payment for water line relocation shall be based on the unit price per each as set forth in the Proposal. Said price shall include all costs necessary to complete the work item including, but not limited to, all excavation (earth, rock, shale), dewatering, bedding, polyethylene encasement, placing, pipe to pipe connections, capping, restraint measures, flushing, disinfection, pressure testing, backfilling, compacting, grading and removal of excess or unsuitable material, as required by the drawings and specifications.

#### 25. Water Meter Installation or Relocation

- a. Final measurement will be based on each completed and installed item.
- b. Payment for water line relocation shall be based on the unit price per each as set forth in the Proposal. Said price shall include all costs necessary to complete the work item including, but not limited to, all excavation (earth, rock, shale), dewatering, bedding, polyethylene encasement, placing, pipe to pipe connections, restraint measures, flushing, disinfection, pressure testing, backfilling, compacting, grading and removal of excess or unsuitable material, as required by the

drawings and specifications. Except for the actual water meter, contractor shall supply all parts to relocate the meter. Contractor shall reuse the existing meter. If meter cannot be reused, Owner will supply a new meter.

#### 26. Fire Hydrant Assembly Installation or Relocation

- a. Final measurement will be based on each completed and installed item.
- b. Payment for fire hydrant relocation shall be based on the unit price per each as set forth in the Proposal. Said price shall include all costs necessary to complete the work item including, but not limited to, all excavation (earth, rock, shale), dewatering, bedding, polyethylene encasement, placing, pipe to pipe connections, restraint measures, flushing, disinfection, pressure testing, backfilling, compacting, grading and removal of excess or unsuitable material, as required by the drawings and specifications.

#### 27. Manhole or Water Valve Lid Adjustments

- a. Final measurement will be based on each completed and installed item.
- b. Payment for adjustments shall be based on the unit price per each as set forth in the Proposal. Said price shall include all costs necessary to complete the work item including, but not limited to, all pavement removal, adjustment rings, concrete and sealant as required by the drawings and specifications. Contractor shall reuse the existing lids if possible. If lids cannot be reused, Owner will supply new lids.

#### 28. Air Release Valves

- a. Final measurement will be based on each completed and installed item.
- b. Payment for air release valves will be paid at the unit price per each size and type as set forth in the Proposal. Said price shall include, but not be limited to, furnishing and installing the valve, miscellaneous piping, valve box or manhole, and other appurtenances; excavation and backfill not included under piping; and all other costs not included under other bid items.

#### 29. Sanitary Sewer Pipe (All Types)

- a. Final measurement will be based on the horizontal length of the completed and installed item, as measured along the centerline.
- b. Payment for sanitary sewer pipe shall be based on the unit price per linear foot as set forth in the Proposal, per the type and size of pipe.

Said price shall include all costs necessary to complete the work item including, but not limited to, all trenching (earth, rock, shale), dewatering, bedding, placing, testing, backfilling, compacting, grading and removal of excess or unsuitable material, as required by the drawings and specifications.

### 30. Sanitary Sewer Stubs and Plugs

- a. Final measurement will be based on each completed and installed item.
- b. Payment will be based on the unit price per each size and type as set forth in the Proposal. Said price shall include, but not be limited to, furnishing and installing stub or plug, and excavation and backfill (not included under piping) as required by the drawings and specifications.

### 31. Concrete Encasement

- a. Final measurement will be based on the horizontal length of the completed and installed item, as measured along the centerline.
- b. Payment for concrete shall be based on the unit price per linear foot as set forth in the Proposal. Said price shall include all costs necessary to complete the work item including, but not limited to, all placing, reinforcing, and compacting as required by the drawings and specifications.

### 32. Standard Sanitary Manholes (All Types)

- a. Final measurement will be based on each completed and installed item.
- b. Payment for manholes shall be based on the unit price per each as set forth in the Proposal, per the type and size of structure. Said price shall include all costs necessary to complete the work item including, but not limited to, all excavation (earth, rock, shale), bedding, placing or building manhole, invert construction, manhole to pipe connections, final grade adjustments to the top, sealing, curing, backfilling, compacting, grading, testing and removal of excess or unsuitable material, as required by the drawings and specifications.

### 33. Extra Depth Sanitary Manholes

- a. Final measurement will be based on the vertical height of the completed and installed item, measured from the base to the top of the cone.
- b. Payment for extra depth manholes shall be based on the unit price per vertical foot as set forth in the Proposal, per the type and size of structure. Said price shall include all costs necessary to complete the

work item including, but not limited to, all excavation (earth, rock, shale), bedding, placing or building manhole, invert construction, manhole to pipe connections, final grade adjustments to the top, sealing, curing, backfilling, compacting, grading, testing and removal of excess or unsuitable material, as required by the drawings and specifications.

#### 34. Adjustment of Existing Manhole

- a. Final measurement will be based on each completed and installed item.
- b. Payment for adjustments shall be based on the unit price per vertical foot of adjustment as set forth in the Proposal. Said price shall include all costs necessary to complete the work item including, but not limited to, all excavation, adjustment rings or sections, sealing, curing, backfilling, grading and testing, as required by the drawings and specifications.

#### 35. Connection to Existing Manhole

- a. Final measurement will be based on each completed and installed connection.
- b. Payment for manhole connections shall be based on the unit price per each as set forth in the Proposal. Said price shall include all costs necessary to complete the work item including, but not limited to, all excavation (earth, rock, shale), dewatering, bedding, pipe connections, testing, backfilling, compacting, grading and removal of excess or unsuitable material, as required by the drawings and specifications.

#### 36. Force Main Connections

- a. Final measurement will be based on each completed and installed connection.
- b. Payment for force main connections shall be based on the unit price per each as set forth in the Proposal. Said price shall include all costs necessary to complete the work item including, but not limited to, all excavation, dewatering, bedding, pipe connection, testing, backfilling, compacting, grading and removal of excess or unsuitable material, as required by the drawings and specifications.

#### 37. Traffic Control

- a. Final measurement for lump sum bids will not be made unless changes to the bid quantity are authorized. For work under a force account, final measurement will be based on records of equipment and labor used during the work.

- b. Payment for lump-sum traffic control shall be based on the lump sum price as set forth in the Proposal. Said price shall include all costs necessary to complete the work including, but not limited to, temporary striping, edge drop-off treatment, construction signs, barricades and channelization devices, as required by the drawings and specifications. Payment for relocation and reuse of the items shall be considered subsidiary to the payment for the initial installation.
- c. Payment for force account work shall be based on the actual quantities of equipment, materials, and labor hours used in performance of the work and the unit prices for each item as submitted by the contractor.

38. Pavement Marking (Permanent and Temporary)

- a. Final measurement will be based on the horizontal length for each of the completed and installed items.
- b. Payment for pavement marking shall be based on the unit price per linear foot or per each as set forth in the Proposal. Said price shall include all costs necessary to complete the work item including, but not limited to, removal of old markings, surface preparation, layout, and taping, as required by the drawings and specifications.

39. Permanent Signage

- a. Final measurement will be based on each completed and installed item.
- b. Payment for permanent signage shall be based on the unit price per each as set forth in the Proposal, per each type of sign. Said price shall include all costs necessary to complete the work item including, but not limited to, excavation, concrete, posts, signs face, and hardware as required by the drawings and specifications.

40. Fence (All Types)

- a. Final measurement will be based on the horizontal length of the completed and installed item.
- b. Payment for fence shall be based on the unit price per linear foot as set forth in the Proposal, per each type of fence. Said price shall include all costs necessary to complete the work item, as required by the drawings and specifications.

41. Seeding (Temporary Or Permanent)

- a. Final measurement will not be made. Contract quantity shall be plan/bid quantity unless changes to the bid quantity are authorized.
- b. Payment for seeding shall be based on the unit price per acre as set forth in the Proposal, per each type of seed. Said price shall include all costs necessary to complete the work item including, but not limited to, aeration, fertilization, mulching and watering, as required by the

drawings and specifications. Contractor shall water seed until final acceptance.

42. Sod (All Types)

- a. Final measurement will be based on the square yards of the completed and installed item.
- b. Payment for sod shall be based on the unit price per square yard as set forth in the Proposal, per each type of sod. Said price shall include all costs necessary to complete the work item including, but not limited to, aeration, fertilization, mulching and watering, as required by the drawings and specifications. Contractor shall water sod until final acceptance.

43. Sediment Control Devices (All Types)

- a. Final measurement will be based on counting the number, measuring the linear footage or measuring the area of the completed and installed item.
- b. Payment for sediment control shall be based on the unit price as set forth in the Proposal, per linear foot for sediment fence and per each for inlet protection and check dams. The unit price shall include full compensation for equipment, labor, material, repair, maintenance and incidental costs, including removal of materials. Removal of sediment, repair and maintenance of installed sediment control shall be subsidiary to sediment control.

MATERIAL TESTING.

This section shall apply to all required testing services for soils, asphalt and concrete. Unless otherwise indicated or specified, on-site testing, may be performed by an inspector employed by the City of Lawrence or by personnel of an approved testing firm hired by the City at the City's option.

1. Asphalt Testing. Sampling and testing of the asphalt mix may be required on all asphalt paving projects constructed in the City of Lawrence.

Samples of the actual asphalt mix being used on a paving project shall be acquired at either the construction site or the batching plant per ASTM Standards D979 and D3665. These samples shall be used to perform an aggregate gradation test (ASTM C136), asphalt extraction test (ASTM D2172), and bulk specific gravity test (ASTM D2726).

In-place density tests may be conducted with a nuclear testing device during the course of the work by City inspectors at the City's option to give general indication of level of compaction. The inspector shall determine the number of tests to be taken and the locations thereof based upon observation of the paving process. Tests performed with a nuclear device shall be conducted as per the requirements of ASTM D2950. Actual in-

place density for payment purposes shall be determined from pavement cores unless otherwise specified.

During compaction, cores may be taken to verify final in-place densities, unless otherwise specified, and as an aid for verifying thickness. Cores shall be made by means approved by the Engineer. Core locations shall be repaired using epoxy concrete, high-strength non-shrink grout, or other approved product. Contractor shall supply equipment and labor for obtaining cores and repairing holes.

2. Concrete Testing. Sampling and testing may be required on all concrete work including curb and gutter, sidewalk, slope paving, retaining walls, inlets, manholes or any other structures.

During the progress of the work, compression tests of the concrete used shall be made as directed by the Engineer in accordance with the requirements of ASTM C31, C143, and C172. Cylinder will generally be broken at seven (7) days, fourteen (14) days and twenty-eight (28) days noting the compressive strength of each break. Slump and air tests will also be taken with cylinders.

3. Soil Testing. Sampling and testing may be required on all subgrade preparation for street construction and all trench backfilling operations within the City of Lawrence.

Prior to commencing earthwork for any street improvement project, the Contractor shall acquire samples of soil and submit samples to an approved laboratory to perform a moisture density test (ASTM D698 for cohesive soils and ASTM D2049 for non-cohesive soils). These tests shall be at the Contractor's expense. The number of tests required will be based on the types of soils encountered on the project. Contact project inspector prior to obtaining samples in order to allow inspector to be present during sampling if desired.

Reports for moisture-density tests shall include the date, the location of the tests, the elevation or depth at which the test was taken, the maximum dry density, and the optimum moisture content as well as properly constructed moisture-density curves for each sample. Also included shall be a determination of the soils plasticity index (PI) and liquid limit and classification in accordance with ASTM D2487. Submit test results to Engineer a minimum of 48 hours prior to beginning earthwork.

During the progress of the earthwork, in-place density tests shall be performed with a nuclear density meter. The inspector shall determine the number of tests to be taken and the location thereof based upon his observation of the work. Results of these tests shall indicate whether or

not the performance specifications stated in Sections 1100 and 1200 of this specification manual have been achieved. If the tests indicate the compaction is not sufficient, the Contractor shall increase the compactive effort on all such inadequately compacted areas. Tests performed with a nuclear device shall be conducted as per the requirements of ASTM D2922.

During the progress of the work of trench backfilling, in-place density tests shall be performed with a nuclear meter. The inspector shall determine the number of tests to be taken and the locations thereof based upon his observation of the backfilling process. Results of these tests shall indicate whether or not the performance specifications stated in Sections 1100 and 1200 of this specification manual have been achieved. If the tests indicate the compaction is not sufficient, the Contractor shall increase the compactive effort on all such inadequately compacted areas.

#### Waterline and Sanitary Sewer Testing

1. Waterline testing shall conform to the requirements outlined in Section 21 of the technical specifications.
2. Sanitary sewer testing shall conform to the requirements outlined in Section 2509 of the technical specifications.