

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 clearness 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 and final shouldering is completed 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 mutilated or destroyed without the permission of the Engineer. The replacement of any pins or monuments shall be by a competent surveyor and shall be acceptable to the City of Lawrence, Kansas.

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. 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. Notice shall be given to the City and other agencies 48 hours in advance of beginning construction work on any street.
4. The Contractor shall be responsible for notifying the police and fire departments, and the school district if work is to be done while school is in session, before closing any street.
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.

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.

The Contractor shall be responsible for keeping its 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 within three days of oral or written notice by the Owner or their representative.

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.

Bid Items

1. Demolition And Removal:

- a. Final measurement will not be made 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 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 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 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 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 on the tonnage of each type of asphalt used.
- b. Payment for asphalt pavement 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, preparing surface, placing pavement, compacting, rolling, connecting to existing pavement, and sealing, as required by the drawings and specifications.
- c. Prices quoted for asphalt will be based on the asphalt oil price in effect on the date of the bid. The contractor shall submit with their bid a copy of the asphalt oil supplier's most current pricing information. Hot mix asphalt provided/placed in a subsequent month will be adjusted for each \$10.00 increase/decrease in the price of asphalt oil; each ton of hot mix asphalt will be adjusted (increased/decreased) by \$0.50 per ton.

The table below 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	Change/Adjustment in Bid Price of Asphalt/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. 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.

10. 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.

11. Curb And Gutter (All Types)

- a. Final measurement will be based on the horizontal length of the completed and installed item.
- 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.

12. 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, flowable fill, backfilling, compacting, grading and removal of excess or unsuitable material, as required by the drawings and specifications.

13. 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, flowable fill, backfilling, compacting, grading and removal of excess or unsuitable material, as required by the drawings and specifications.

14. 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.

15. 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.

16. 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, flowable fill, backfilling, compacting, grading and removal of excess or unsuitable material, as required by the drawings and specifications.

17. 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, flowable fill, backfilling, compacting, grading and removal of excess or unsuitable material, as required by the drawings and specifications.

18. 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, flowable fill, backfilling, compacting, grading and removal of excess or unsuitable material, as required by the drawings and specifications.

19. 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, flowable fill, backfilling, compacting, grading and removal of excess or unsuitable material, as required by the drawings and specifications.

20. 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, flowable fill, backfilling, compacting, grading and removal of excess or unsuitable material, as required by the drawings and specifications.

21. Water Meter 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, flowable fill, 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.

22. Fire Hydrant 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, flowable fill, backfilling, compacting, grading and removal of excess or unsuitable material, as required by the drawings and specifications.

23. 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.

24. Traffic Control

- a. Final measurement will not be made unless changes to the bid quantity are authorized.
- b. Payment for 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.

25. Pavement Marking (Permanent and Temporary)

- a. Final measurement will be based on the horizontal length or each of the completed and installed items as indicated in the Proposal.
- 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.

26. 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.

27. Seeding (Temporary Or Permanent)

- a. Final measurement will be based on the acreage of the completed and installed item.
- 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.

28. Sod (All Types)

- a. Final measurement will be based on the square yard 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.

29. 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.

1. Asphalt Testing. Sampling and testing of the asphalt mix shall 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), stability and flow test (ASTM D1559) and bulk specific gravity test (ASTM D2726). One complete group of tests shall be conducted on both the base material and the surface material for each paving project.

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. The inspector shall determine the number of tests to be taken and the locations thereof based upon his observation of the paving process. A minimum of five (5) tests per day of street improvement shall be taken unless otherwise directed by the Engineer. Tests performed with a nuclear device shall be conducted as per the requirements of ASTM D2950.

During compaction, cores may be taken to determine in-place densities 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 shall 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. At least one sample, consisting of four (4) cylinders minimum, shall be taken from each one hundred (100) cubic yards of concrete placed or fraction thereof. In the event that the total amount of concrete on a project does not exceed two hundred (200) cubic yards, a minimum of four (4) specimens (consisting of four (4) cylinders each) shall be submitted for the project. In the case of a reinforced concrete box, a minimum of one sample shall be taken for each day's pour.

The cylinders shall be cast in the field and transported to the laboratory twenty four (24) hours after the concrete was placed. Each set of compression test cylinders shall be marked or tagged with the date and time of day the cylinders were made, the location in the work where the concrete represented by the cylinders taken was placed, the delivery truck or batch number, the air content, and the slump. From each sample consisting of four cylinders, one (1) shall be broken at seven (7) days, one (1) at fourteen (14) days and two (2) at twenty-eight (28) days noting the compressive strength of each break.

Maturity meters may be used at the discretion of the Engineer after precaution has been made to ensure the accuracy of the meter. Maturity meter test shall conform to (ASTM C1074)

Slump tests (ASTM C143) and air tests (ASTM C231) shall be made for every seventy five (75) cubic yards of concrete placed or fraction thereof. Slump and air tests shall be taken with each cylinder series.

If samples of fresh concrete have not been obtained and tested, a minimum of three (3) cores shall be taken per ASTM C42 and broken as directed by the Engineer. Air content (ASTM D457) and cement content (ASTM C85) shall also be determined. Concrete in the portion of the structure from which the core was taken will be considered adequate if the average strength of the cores is equal to a minimum of ninety five (95%) percent of the specified strength (f'c) and if the strength of any single core is not less than eighty (80%) percent of f'c. All core holes shall be completely filled with a low slump, high strength concrete at the expense of the Contractor. All reports by testing laboratories shall include the type of structure and information on obtaining, transporting, storing, curing, time between obtaining and casting cylinders (when applicable), supplier, finisher and batch as well as the specific test data.

3. Soil Testing. Sampling and testing shall 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 for performing a moisture density test (ASTM D698 for cohesive soils and ASTM D2049 for non-cohesive soils). The number of tests required will be based on the types of soils encountered on the project.

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 plastic index (PI) and liquid limit and classification in accordance with ASTM D2487.

During the progress of the earthwork, in-place density tests shall be performed with a nuclear density meter by a qualified technician approved by the City of Lawrence or by an inspector employed by the City of Lawrence as determined by the Engineer. The inspector shall determine the number of tests to be taken and the location thereof based upon his observation of the work. A minimum of two (2) tests per lift per five hundred (500) feet of street improvement shall be taken unless otherwise directed by the Engineer. 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 density tester by a City of Lawrence inspector. The inspector shall determine the number of tests to be taken and the locations thereof based upon his observation of the backfilling process. A minimum of two (2) tests per one thousand (1000) feet of trench shall be taken unless otherwise directed by the Engineer. 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.