EXHIBIT A

CITY OF OVERLAND PARK

2002 STORM SEWER MAINTENANCE CONTRACT

SPECIFICATIONS

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SPECIFICATIONS

S-1 SCOPE OF WORK

The work provided for in these Specifications shall consist of furnishing all labor, materials, appliances, and equipment, and performing all work and operations in connection with the construction of items and all other incidental and related work as set forth in these Specifications and as directed by the Engineer to make a complete and finished job. Work generally consists of replace-in-kind construction activities on the City's storm sewer structure and conveyance system.

S-2 SPECIFICATIONS

The work shall conform to these Specifications and to the "Standard Specifications" where reference is made herein. Where reference is made in the Specifications and Contract Documents to "Standard Specifications," it shall mean that the reference is made to the current edition of the Standard Specifications for State Road and Bridge Construction, Kansas Department of Transportation and the Overland Park Municipal Code, with such revisions, amendments, and supplements as are contained herein.

Sanitary Sewer construction shall be in accordance with the "Construction and Materials Specification" as prepared by the Johnson County Unified Wastewater Districts, and on file with the State of Kansas, Department of Health and Environment, Permit No. 20969.

All sanitary sewer service line work shall conform to requirements of the Johnson County Unified Wastewater Districts Service Line Design and Construction Standards, and the most recent edition of the BOCA National Plumbing Code.

S-3 METHOD OF MEASUREMENT

The completed work shall be measured by the units described in the Bid under each bid item that is satisfactorily completed by the Contractor. At monthly intervals, beginning one month after the Notice to Proceed, the Contractor shall submit to the Manager of Maintenance Operations an accurate record of the work completed.

S-4 BASIS OF PAYMENT

The amount of completed work, measured as set forth above, shall be paid for at the contract unit price bid per item described in the Bid and shall be full compensation for furnishing all materials, labor, equipment, tools, supplies and incidental related items necessary to complete the work in accordance with the Specifications. Work not measured separately for payment is subsidiary to the item to which it pertains.

S-5 FORCE ACCOUNT

The force account will be used for payment of work to be performed using negotiated unit prices.

S-5.1 Measurement and Payment

Payment for work items not included in the original unit price bid shall be paid for based on unit prices negotiated with the applicable delivery order, at the specified size and type if applicable, and thereafter included in the unit price list at the negotiated unit price bid. Negotiated unit price work

shall not exceed the contract set price for "Force Account". Before any work is performed, the Contractor shall submit his proposed price for approval by the Engineer, and shall have received the written approval of the Engineer for the proposed work.

S-6 EQUIPMENT REQUIREMENTS

S-6.1 Paver Machine

A self-propelled bituminous paver machine shall be used for the asphalt paving operations. The bituminous paver shall be equipped with automatic screed controls as set forth in Section 151.20 of the Standard Specifications.

S-6.2 Roller

A minimum of two (2) steel wheel rollers, as directed by the Engineer, shall be used with the paving operation and shall be on the job site along with qualified operators prior to commencing any paving operation.

Compaction equipment shall conform to the requirements of Division 150 of the Standard Specifications.

S-6.3 Forms

Forms shall be of steel or wood, free from warp and shall be sufficiently strong and rigid and securely staked and braced to obtain a finished product correct to the dimensions, lines and grades required. All forms must be cleaned and oiled before each use.

S-6.4 Transportation Equipment

All equipment used by the Contractor having metal tracks shall not be driven over City streets other than those streets being constructed. Such equipment must be transported from one planing area to the next planing area.

S-6.5 Planing Machine and Equipment

The planing machine to be used in this contract shall be designed and built for cold planing work; shall be self-propelled; and shall have a means of planing, or milling of the old pavement surface. The drum patterns shall permit a grooved or smooth surface finish as selected by the Engineer and the drum shall be totally enclosed to prevent discharge of any loosened material on adjacent work areas. A dust suppression system must be part of the equipment. Maximum width of the planing machine shall be 12'6"; drum widths shall be 4'6" minimum to 9'6" maximum. Smaller machines may be used for auxiliary purposes only. A 16" milling machine attached and powered by a uniloader capable of a 3.5" to 4" deep cut shall be used for asphalt repair work.

The cold planing machine shall have adequate power to force the cutting edge(s) of the drum teeth to the desired depth below the surface of the pavement without causing undue irregularities in the surface of the planed pavement.

The planer shall be so designed and constructed that it is capable of cutting flush to all curbs, inlets, manholes or other similar obstruction within the paved area.

S-7 SAMPLING AND TESTING

All sampling and testing, deemed necessary by the Engineer shall be performed by a Testing Laboratory selected by the City. The City shall pay the costs of all such tests that show compliance with the Specifications. However, in the event that any test indicates non-compliance with the Specifications, additional testing will be paid for by the Contractor to determine acceptability of the material or methods.

S-8 CLEARING AND GRUBBING

Clearing shall consist of the felling and cutting up of trees, stumps, roots, shrubs, hedges and other protruding obstructions that interfere with the execution of the work and disposal of trees and other vegetation whose removal are necessitated by other items of work, together with downed timber, rubbish, snags, mowing, and brush occurring within the areas to be graded. Trees and other vegetation shall be completely removed, including roots as specified herein after. Except in areas to be excavated, stump holes and other holes from which obstructions are removed, shall be backfilled with suitable material and compacted in accordance with the best standard practice for the area and type of soil encountered. The method of disposal shall be accomplished in accordance with all applicable Federal, State and local ordinances.

S-8.1 Payment

This work shall not be paid for directly, but shall be subsidiary to other bid items in the contract.

S-9 TREE REMOVAL

Tree removal shall consist of the felling, cutting up, and disposal of trees greater than 12" in diameter, measured 24" above the natural ground level. The method of disposal shall be accomplished in accordance with all applicable Federal, State, and local ordinances.

S-9.1 Payment

This work shall not be paid for directly, but shall be subsidiary to other items bid in the contract..

S-10 REMOVAL OF EXISTING STRUCTURES

This item shall include the removal of subsurface structures such as all existing drainage structures, head walls, pipe, inlets, manholes, retaining walls, conduits, foundations, cables, and other obstructions, which are encountered during construction. This item shall also include removal of surface structures such as curbs, asphaltic concrete pavement, sidewalks, driveway pavement, signs, markers, and any obstructions, which are encountered during construction. This item shall include any items which may be in conflict with the new construction and which would normally be encountered upon a careful examination of the site of the work. This work shall conform to Section 206 of the Standard Specifications. This includes repair, plugging, or removal of existing pipe after removal of structures.

S-10.1 Payment

This work shall not be paid for directly, but shall be subsidiary to other bid items in the contract.

S-11 EXCAVATION FOR STRUCTURES

S-11.1 General

Work under this item shall consist of all necessary excavation for structures including the removal and disposal of all excess excavated materials, backfill around the completed structural element and related work. All work shall be done in accordance with Section 207 of the Standard Specifications

and the following requirements.

S-11.2 Excavation and Removals
All removal work, which might endanger the new structure, shall be completed before any work on the new structure is started. Partial removals of any structure or adjustments of any utility shall be made with care to preserve the value of the retained portions. Work around any live utility shall be done in such a manner that uninterrupted service can be maintained or relocated. Excavated material, which is unsuitable for backfill and excess material not required for backfill shall be disposed of off-site at an approved disposal site in compliance with local, federal, and state regulations.

S-11.3 Backfill
Backfill material shall be free from large or frozen lumps greater than 3 inches, wood, or other extraneous material. All spaces excavated and not occupied by the new structure or by porous backfill shall be refilled with earth to the original ground surface or to the finished ground lines shown on the plans. No measurement will be made of backfill or compaction of backfill around structures except that portion above the original ground line, which is situated within an embankment designated to be compacted. All backfill shall be thoroughly compacted and its top surface neatly graded. The backfill at abutments, which fall within the limits, of the roadbed shall be placed in successive 6 inch lifts and uniformly compacted to a minimum of Type AA, MR 3-3 in accordance with Section 210 of the Standard Specifications. Backfill placed adjacent to walls shall be compacted with light equipment to prevent over stressing the walls. Backfill placed around piers shall be kept at approximately the same elevation on opposing sides. Areas to receive fill shall be stripped of all vegetation and topsoil prior to placement of till. Existing slopes greater than 4 horizontal to 1 vertical shall be benched to assure adequate bonding between existing slope and the fill.

S-11.4 Payment
Excavation for structures shall not be paid for directly, but shall be considered subsidiary to other bid items in the contract.

S-12 COMPACTION OF EARTHWORK
All subgrade shall be uniformly compacted in accordance with Section 210 of the Standard Specifications. The Contractor shall have available adequate hand or mechanical compaction equipment to accomplish the compaction as set forth in these Specifications. No separate payment will be made for water required for compaction of subgrade.

All fill areas outside the limits of pavement shall be uniformly compacted to a minimum of Type B, MR-90, in accordance with Section 210 of the Standard Specifications.

If additional fill is required for subgrade, aggregate designated as AB-3 shall be used in accordance with Section 1105 of the Standard Specifications, or as approved by the Engineer, compacted to Type AA, MR-3.

S-12.1 Payment
This work shall not be paid for directly, but shall be subsidiary to other bid items in the contract.

S-13 ROCK EXCAVATION AND BLASTING
Where solid rock, shale, or similar material is found, the excavation shall be performed as directed

by the Engineer. The excavated areas shall be backfilled to the subgrade and shoulder elevation with materials as directed by the Engineer. **ABSOLUTELY NO BLASTING OF ANY KIND WILL BE ALLOWED ON THIS PROJECT**.

S-13.1 Payment
This work shall not be paid for directly, but shall be subsidiary to other bid items in the contract.

S-14 GRADING
Regrading of overflow swales and area grading shall be to the neat lines and grades indicated by the Engineer. All regraded areas shall have minimum topsoil as specified under the sodding specification. Final grading shall be rounded and blended into existing grades to produce a smooth interface suitable for homeowner maintenance.

S-14.1 Payment
This work shall not be paid for directly, but shall be subsidiary to other bid items in the contract.

S-15 BRACING AND SHORING
It shall be the Contractors' responsibility to brace and shore existing structures during construction. Any additional damage to or collapse of existing structures during the contract period shall be the sole responsibility of the Contractor.

The Contractor shall brace and shore all trenches in full accordance with Occupational Safety and Health Standards - Excavations; Final Rule 29 CFR Part 1926.

S-15.1 Payment
This work shall not be paid for directly, but shall be considered subsidiary to other bid items in the contract. No additional payment shall be considered for increased quantities of earthwork, asphalt removal and replacement, or increases in other items as a result of compliance with this specification.

S-16 SELECT SOIL
Select soil shall be placed at the locations as directed by the Engineer. Select soil shall consist of surface soil (top soil) or other suitable soil as stipulated in Section 2109 of the Standard Specifications, and as approved by the Engineer. Placing select soil shall be in accordance with Section 214 of the Standard Specifications.

In general, all areas to be seeded or sodded shall consist of a minimum of 6" - 8" of topsoil, free from clods, rocks, trash, and other debris. If the area has been severely compacted by heavy trucks or other equipment, it shall be cultivated to a depth of 6" - 8" by tilling or disking. At locations where excavation to final grade results in material unsuitable for vegetation, as determined by the Engineer, the Contractor shall undercut and remove the material and place select soil.

All areas indicated as "garden" on the plans and disturbed by construction activity shall have select soil placed on the top 18 inches of the garden. Such soil shall be free of granular materials used in construction and excavated rock. The Contractor shall properly dispose of existing unsuitable soil.

S-16.1 Payment
The Contractor shall make every reasonable effort to stockpile existing topsoil prior to deep excavations and reuse it as select soil in the same general locations. No direct payment shall be

made for undercutting and removing unsuitable materials in cut sections, or stockpiling and placement of select soils, as this work shall be considered subsidiary to other bid items in the contract.

S-17 ASPHALTIC CONCRETE (BM – MIX)

S-17.1 General

The Standard Specifications, Section 601, 602, and 603 shall govern the asphaltic concrete work, except as otherwise modified or stipulated herein.

S-17.2 Asphalt Cement

Asphalt cement for all construction except BM-3 Modified shall conform to the requirements of SHRP Performance Grade 64-28 as specified under KDOT Special Provision 90M-0196-R02. A copy of the test report on the asphalt cement from the oil refinery shall be submitted to the Engineer's office a minimum of 15 days prior to any asphalt construction operations. Asphalt cement shall not be paid for directly, but shall be considered subsidiary to other bid items in the contract.

S-17.3 Asphalt Cement Modified

Asphalt cement for construction of BM-3 Modified pavements shall conform to the requirements of SHRP Performance Grade 70-28 as specified under KDOT Special Provision 90M-0196-R02. A copy of the test report on the asphalt cement from the oil refinery shall be submitted to the Engineer's office a minimum of 15 days prior to any asphalt construction operations. Asphalt cement shall not be paid for directly, but shall be considered subsidiary to other bid items in the contract.

S-17.4 Surface Aggregate

Aggregate for surface bituminous mixture required shall conform to the Mix Designation (BM-2) as stated in Section 1103 of the Standard Specifications.

S-17.5 Mix Design

The Contractor shall submit to a qualified testing laboratory, as approved by the Engineer, samples of all materials that he proposes to use in the mix. The laboratory's recommendations for blending the aggregates to meet the requirements of the Specifications and provide a workable mix shall be submitted to the Engineer's office a minimum of 15 days in advance of the scheduled paving operation. The designated testing laboratory shall perform the necessary aggregate testing to determine compliance with quality and gradation requirements. The testing laboratory shall also perform the required testing for a complete set of Test Property Curves for a Hot-Mix design by the Marshall Method. The percent asphalt in the design mix will be based on the Marshall Test Properties and shall be as determined by the Engineer. All asphaltic concrete mix design submittals shall be at the expense of the Contractor.

All testing during construction shall be made by a designated testing laboratory at the expense of the City, except for any retesting due to non-compliance. This expense shall be borne by the Contractor.

S-17.6 Marshall Mix Design Criteria

Marshall Stability	
(75 Compactive Blows Each Face of Specimen)	6.3kN Minimum
Flow	16 Maximum
Percent Air Voids	2 – 4
Per Voids in Mineral Aggregate	15 Minimum

S-17.7 Asphalt Temperature
The bituminous mixture shall be delivered to the paver at a temperature between 135 degrees C and 162 degrees C, or as otherwise directed by the Engineer.

S-17.8 Weather Limitations
Weather limitations in Section 603.06 of the Standard Specifications shall apply except that:

1) Bituminous mixtures may only be placed when both the ambient air temperature and the road surface temperature is equal to or greater than that shown in Table 3 of the Standard Specifications.
2) Surface temperatures listed in Table 3 of the Standard Specifications shall be increased by 3 degrees Celsius.

S-17.9 Road Surface Preparation
When the bituminous mixture is placed on an existing bituminous surface, Section 603.03 (b) (02) of the Standard Specifications shall apply except that in addition to brooming, a high pressure type water truck, capable of washing all fines, dirt, and debris from the surface may be required prior to overlaying as directed by the Engineer. Equipment compliance with this specification shall be by visual observation by the Engineer at the commencement of washing operations. Road surface preparation shall not be paid for directly, but shall be considered subsidiary to other bid items in the contract.

S-17.10 Measurement and Payment
Asphaltic concrete street patching shall be paid for at the negotiated unit price per square foot for the specified thickness. The negotiated unit price will be with the applicable delivery order and thereafter included in the unit price list at the negotiated unit price bid.

S-18 WORK DAY LIMITATION AND TRAFFIC ROUTING
During construction operations, one lane in each direction must be maintained at all times on all four-lane thoroughfares. On two lane streets, traffic shall be carried through construction on all operations except during street resurfacing. Adequate signing and flaggers for one way stop and go traffic shall be required on two lane streets to carry traffic through construction. The Engineer shall approve all traffic control plans prior to commencing the work. These plans will include placement and layout of traffic control devices, detour and other signing, temporary and final pavement markings where necessary, and sequencing of the work.

No work shall be permitted on weekends or holidays unless approved by the Engineer or his representative.

The closed lane length shall be determined by the amount of repair in a given section as approved by the engineer. The time a section shall be closed will be determined by the Engineer.
Traffic signal loop replacement shall be completed prior to the installation of the surface course

asphaltic concrete and after completion of any construction that might necessitate replacement of any loop.

S-19 CONCRETE CONSTRUCTION

All concrete construction shall meet the requirements of Section 701 of the Standard Specifications and as hereafter presented.

S-19.1 Mix Designs

Mix designs shall be approved by the Johnson County Concrete Board as meeting the designation "JCCB 4K" or "JCCB 5K".

S-19.2 Ready-mixed Concrete

Ready-mixed concrete shall be mixed and placed in accordance with the requirements of the Standard Specifications, except that ready-mixed concrete shall be transported with agitation, and such concrete shall not be used when the cement has been in contact with the aggregate more than one hour before it is placed. All concrete shall meet the slump requirements specified, and the Engineer will require additional slump tests if, in his opinion, it appears that excessive water has been added. Concrete, which does not meet this requirement will be rejected.

A diligent effort shall be made by the Contractor and the ready-mix concrete producer to deliver concrete at regular intervals. A uniform mix shall be maintained throughout each concrete pour. Concrete shall be delivered at intervals frequent enough to prevent any cold joints.

S-19.3 Placement and Curing

The Contractor shall provide 24 hours notice of his intention to place concrete to allow for adequate supervision.

Curing of all concrete shall meet the requirements of the Municipal Code.

S-19.4 Forms

Forms shall be of steel or wood, free from warp and shall be sufficiently strong and rigid and securely staked and braced to obtain a finished product correct to the dimensions, lines and grades required. All forms must be cleaned and oiled before each use. In no case shall forms obstruct the waterways of the storm sewer system.

JCCB 4K and JCCB 5K Construction

All concrete used in construction on this project shall be classified as JCCB 4K or JCCB 5K. The Contractor shall determine the actual mixed proportions of cement, aggregates, and water.

S-19.6 Measurement and Payment

JCCB 4K

No direct payment will be made for JCCB 4K Concrete construction, as it shall be considered subsidiary to other items in the contract.

JCCB 5K

JCCB 5K Concrete construction will be paid at the negotiated unit price per cubic yard. The negotiated unit price will be with the applicable delivery order and thereafter included in the unit price list at the negotiated unit price bid.

S-20 SAWING

All required sawing including curb and gutter, removal and replacement, and any other sawing shall not be paid for directly, but shall be subsidiary to other bid items in the contract.

S-21 REINFORCING STEEL

All fabrication and placement of reinforcing steel shall be in conformance with Section 703 of the Standard Specifications and Special Provision 90M-165-R7. All reinforcing shall be held in place and positioned by pins, bar chairs, or other approved devices or methods. Reinforcement shall be new billet ASTM A615 Grade 60 for JCCB 5K concrete construction. Reinforcing shall be new billet ASTM A615 Grade 40 for all other construction.

S-21.1 Payment

This work shall not be paid for directly, but shall be subsidiary to other bid items in the contract.

S-22 CURB CONSTRUCTION

S-22.1 Concrete Curb

Concrete curbs shall be installed, or removed and replaced as directed by the Engineer and in accordance with the requirements of the Overland Park Municipal Code, and shall consist of JCCB 4K concrete.

S-22.2 Equipment

A slip form curb machine shall be required on all continuous curb construction of lengths greater than 100 feet.

S-22.3 Construction

S-22.3.1 Concrete Placement

The concrete shall not be placed until the sub-grade has been inspected for compaction and moisture. The concrete shall be compacted with an approved internal type vibrator, or by hand spudding and tamping. The surface shall be shaped by use of a steel tool to produce the sections shown on the drawings. The edges shall be rounded with edgers to form the radii as directed by the Engineer.

The surfaces shall be finished with a wooden or metallic float and brushed. All concrete shall be cured in accordance with the Overland Park Municipal Code.

S-22.3.2 Inlets

Curbs constructed in front of existing inlets shall be paid for at the contract unit price bid per lineal foot of concrete curb. (See Standard Curb Inlet Detail).

S-22.3.3 Line and Grade

The new concrete curb and gutter shall be accurately placed in accordance with the line and grade as established by the Engineer.

S-22.4 Removal and Replacement

S-22.4.1 Excavation
Excavation, removal of concrete, concrete curbing, sidewalks, pavement material, or any other items required to be removed for the completion of this project shall be removed from the construction site and disposed of by the Contractor. The concrete curb shall be sawed at each end of the section of curb to be removed. The Contractor will be responsible for all damage to the curb and gutter resulting from his operations beyond the limits marked repair all such damages, at no additional cost.

S-22.4.2 Removal and Replacement
The sub-grade area between the removed pavement and in front of the new curb shall be compacted as required by the Engineer and specifications, but not less than Type AA (MR-5), clean of any foreign material, and moistened prior to placing concrete. If additional fill is required for subgrade, aggregate designated, as AB-3 shall be used in accordance with Section 1104 of the Standard Specifications, or as approved by the Engineer, and 95% compacted. The Contractor shall have available adequate hand or mechanical compaction equipment to accomplish the compaction as set forth in these Specifications. Concrete, as a base material shall be replaced in front of the curb and shall be in place five days, or shall have obtained 70% design strength prior to placement of asphalt surface. The concrete shall be left below the existing surface by the surface thickness, and an asphaltic concrete surface shall be placed over the concrete and compacted. The surface shall be BM-2 unless otherwise specified in the plans. Concrete and asphalt in front of the new curb shall not be paid for directly but shall be subsidiary to other bid items in the contract

S-22.4.3 Pavement Replacement
All pavement requiring replacement along the replaced 2-foot concrete curb and gutter shall be saw cut, in a true line, a minimum of 2" depth in front of the curb and asphaltic concrete surface mix replaced, rolled, and compacted. The sub-grade area between the removed pavement and its front of new curb, shall be compacted as required by the Engineer and specifications, but not less than Type AA (MR-5), clean of any foreign materials, and moistened prior to placing concrete.

S-22.5 Measurement and Payment
Payment will be made at the contract unit price bid per lineal foot for "Curb and Gutter, Combined", of the specified type. Curb in front of handicapped ramps, curb transitions, Type C curbs, and other locations not a standard width or section, will be paid for as "Curb and Gutter, Combined" unless otherwise specified.

S-23 DRIVEWAYS
All concrete, asphalt, or gravel driveways that are damaged or removed shall be constructed to the same widths and with the same material that existed prior to construction, unless noted otherwise by the Engineer. All driveways of every material shall be constructed on a prepared sub-grade, compacted to 95% for a depth of 6" in cut sections, and to a depth of 18" in fill sections.

S-23.1 Concrete Driveways
Where construction requires the removal and replacement of existing concrete driveways, such removal shall be accomplished by first sawing the existing driveway, as directed by the Engineer, and removing all material to be replaced. A one-half inch (1/2") pre-molded expansion joint shall be installed at the sawed joint, and the driveway and drive apron replaced with concrete. Concrete driveways shall be replaced to a minimum thickness of 6", except that in no case shall it be less than the section being replaced, and it shall include wire mesh if the existing driveway is so reinforced. If wire mesh is used, it shall be 6" x 6" #6 WWF provided in sheet form. Rolled wire mesh shall not

be allowed. All concrete shall conform to JCCB 4K concrete as defined in these Specifications. Driveways shall receive a nonslip finish obtained by a wood float and hairbrush or broom applied transverse to the centerline of the driveway.

S-23.2 Asphalt Driveways
Where roadway construction requires the removal and replacement of existing asphalt driveways, such driveways will be sawed and all material removed as directed by the Engineer. The driveway shall be replaced with a minimum of 6" of asphaltic concrete intermediate course upon the prepared sub-grade, but in no case shall it be less than that section being replaced. Placing and compaction of the asphalt driveway pavement shall be in accordance with the Standard Specifications and in 4" maximum lifts.

S-23.3 Gravel Driveways
Where construction requires the removal and replacement of existing gravel driveways, such driveways shall be removed as directed by the Engineer. The minimum pavement section for gravel replacement shall be 6" of AB-3, which shall be laid watered, manipulated and compacted in lifts not to exceed 3".

S-23.4 Temporary Access
The Contractor shall not prohibit access to the property without prior notification to the property owner. If access is prohibited for longer than a five (5) calendar day period where owner has only one access, temporary access shall be provided. Temporary access shall consist of AB-3 aggregate, wood planks, or any other means of providing access to the property. This work shall not be paid for directly but shall be subsidiary to other bid items.

S-23.5 Measurement and Payment
Concrete/Asphalt driveway replacement shall be paid for at the negotiated unit price per square foot for "Concrete Driveways" and "Asphalt Driveways"of the specified thickness. The negotiated unit price will be with the applicable delivery order and thereafter included in the unit price list at the negotiated unit price bid.

Gravel driveway replacement shall not be paid for directly, but shall be subsidiary to other bid items in the contract.

S-24 TYPE II STREET REPAIR
This item of work shall consist of repair of existing roadway pavement damaged by construction of the proposed storm sewer. All roadway repairs shall conform to the requirements of Section 812 of the Standard Specifications except as modified by the requirements herein.

Repair shall be accomplished by first determining the width of trench required to excavate for the various sizes of storm sewer pipes involved. All excavated material and pavement shall be removed from the site and not used for backfill. All trench walls shall be in a vertical plane. Shoring and bracing shall be used when necessary to prevent undercutting of undisturbed pavement.

Trenching shall be backfilled with crushed rock backfill (AB-3) or removable flowable fill to within 8 inches of the pavement surface. A minimum 12 inch bench shall be provided on each side of the trench. Two 3 inch lifts of asphalt concrete intermediate course shall be placed for the full width of disturbed pavement area. The remaining 2 inches shall be asphaltic concrete surface course compacted to 95% standard density. Tack coat shall be applied between all lifts of asphaltic

concrete. The surface of the patch shall match existing grade and cross slope of the surrounding pavement.

S-24.1 Payment
This work shall not be paid for directly, but shall be subsidiary to other bid items in the contract.

S-25 FLOWABLE FILL
The Contractor shall use low strength flowable fill as directed by the Engineer and according to the applicable sections of Special Provision 90P-188. The flowable fill mix design shall be submitted to the Engineer for approval and shall be such that it can be pumped.

S-25.1 Measurement and Payment
This work shall not be paid for directly, but shall be subsidiary to other bid items in the contract.

S-26 CONCRETE SIDEWALK CONSTRUCTION
All sidewalk construction shall comply with the City of Overland Park Municipal Code.

S-26.1 Sub-grade Preparation
The sub-grade shall be uniformly compacted and evenly graded to the required sub-grade elevation. All loose or extraneous material shall be removed from the sub-grade and soft spots shall be uniformly re-compacted prior to placement of concrete. The Contractor shall have available adequate hand or mechanical compaction equipment to accomplish the compaction as set forth in these specifications.

S-26.2 Dimensions
The width of any sidewalk repair shall be the same as that being replaced, and the width of new sidewalk construction shall be 4', or 5', as indicated by the Engineer. The minimum allowable thickness shall be 4", except within a driveway approach area or handicapped ramp, where the minimum allowable thickness shall be 6".

S-26.3 Reinforcing
Reinforcing of sidewalks will not be required except in unusual conditions where the City Engineer may require reinforcing or welded wire fabric. When welded wire fabric is used it shall be placed two inches (2") from the finished surface of the sidewalk. There will be no direct payment for this item, and it shall be subsidiary to the unit price bid for sidewalk replacement.

S-26.4 Sidewalk Repair Details

S-26.4.1 Limits
The areas of sidewalk to be removed and replaced shall be as directed by the Engineer, and sawed to provide a neat and straight joint. The Contractor will be responsible for any damage to existing sidewalk resulting from his operations beyond the limits marked or designated by the Engineer or his authorized representative, and shall satisfactorily repair any such damage at his own expense. All disturbed areas shall be restored to their original condition, which includes backfilling, sod, driveways, underground sprinkler systems, and any other items damaged by the Contractor.
S-26.4.2 Sub-grade Preparation
Defective sidewalk, excess base materials, and tree roots shall be removed from the construction site and disposed of by the Contractor. Whenever practical, the areas to be removed will be marked at a construction or contraction joint, otherwise concrete sawing will be required to provide a neat and

straight joint. Sawing at a contraction or construction joint will be required only when the joint is not of sufficient depth to provide a neat and straight break line.

After the defective sidewalk, excess materials, and tree roots have been removed; the sub-grade shall be uniformly compacted to a density equivalent to the density of the immediately surrounding undisturbed soil and evenly graded to the required sub-grade elevation.

Concrete shall not be placed on frozen sub-grade.

Sub-grade shall be properly moistened prior to placing concrete.

S-26.4.3 Grades and Slopes
The grade or slope along the length of the sidewalk repair shall be a uniform transition between ends of undisturbed sidewalk unless otherwise directed by the Engineer. The standard cross slope for sidewalk shall be 1/4" per foot and shall slope toward the street. Providing the existing sidewalk does not have standard cross-slope, a uniform transition shall be made to existing sidewalk.

S-26.5 Measurement and Payment
Payment shall be made for the construction of sidewalks at the contract unit price bid per square foot of "Remove & Replace Sidewalk" of the specified thickness.

S-27 STORM SEWERS

S-27.1 Location and Grade of Sewers
All storm sewer construction shall be in accordance with the Overland Park Municipal Code. All storm sewers, structures and appurtenances shall be located as determined by the Engineer. The grade and alignment of the pipe shall be determined and maintained from tacked offset stakes located alongside the trench upon which cuts and elevations have been established by the Contractor. Pipe alignment during construction shall be maintained by the use of laser alignment equipment. A minimum of one foot of cover shall be maintained over the storm sewer pipe.

S-27.2 Pipe Materials
All storm sewer pipe specified by the Engineer shall be in accordance with the Standard Specifications. The type of bedding materials to be used to construct this project shall be Class "C" in all areas except under pavement, where AB-3 shall be used above the pipe spring line, or where noted otherwise on the plans. Unless otherwise noted on the plans, all storm sewer pipes shall be Class III reinforced concrete pipe in accordance with Section 1902 of the Standard Specifications.

S-27.3 Pipe Joints
The engineer reserves the right to require joint testing on pipe sections, either at the plant or in place, as designated by the Engineer to demonstrate compliance.

All lift holes in concrete storm sewer pipe shall be sealed by the use of an approved grout or plugs. If a plug is selected, the lift hole shall be preformed and tapered to accommodate a specified plug size. If grout is selected, the pipe shall be grouted solid through the thickness of the pipe at the time of installation, prior to any backfilling operations.

S-27.4 Special Pipe
All special pipe sections necessary to complete the storm sewer system as directed by the Engineer

shall be furnished by the Contractor. These sections shall include, but not be limited to, drop joint or radius pipe, bends, tees, and end sections. The pipe manufacturer shall provide shop drawings indicating the exact methods to be used to achieve the lines and grades indicated by the Engineer, including a pipe laying schedule, and the configuration and number of any special pipe sections. All special pipe sections used shall be subsidiary to other bid items in the contract.

S-27.5 Measurement and Payment

Storm sewer pipe shall be measured by the lineal foot of the various sizes of storm sewers. Payment shall be made on the amount of completed and accepted work at the contract unit price bid per lineal foot for "Replace/Repair Storm Sewer Pipe" of the specified size and type, with the lengths determined from center to center of structure, unless otherwise noted by the Engineer.

Payment for storm sewer end sections will be made at the contract unit price bid per each for "Replace/Repair Storm Sewer Pipe End Section" of the specified size and type. Concrete toe walls and/or bar grates shall be considered subsidiary to end sections.

Prices shall be full compensation for excavating (including rock if necessary), bedding, backfill, and for furnishing all materials necessary to complete the work and shall include all costs in modifying the existing damaged pipes or structures affected by this work.

S-28 STORM SEWER INLETS AND MANHOLES

Storm sewer inlets and manholes shall be constructed in accordance with the Overland Park Municipal Code.

All storm sewer structures used on this project shall be of precast concrete, or poured in place concrete type. If precast concrete structures are used, the tops shall be poured in place, and a minimum of 6" of the wall steel shall be left exposed, and poured into the tops. Precast shop drawings shall be submitted and approved by the Engineer. All pipes entering or exiting precast structures shall be encased in a minimum of 6" of concrete all around the pipe for a distance of 2' adjacent to each structure.

S-28.1 Measurement and Payment

Curb/Area Inlets

Payment shall be made at the contract unit price bid per each for "Replace/Repair Curb Inlets' and "Replace/Repair Area Inlets", of the specified size and type. The price shall be full compensation for structures up to 8' deep, excavation (including rock if necessary), backfill, steps, castings, concrete, reinforcing steel, and other materials necessary to complete the work. The welded steel frames and grates for curb inlets and area inlets shall be thoroughly cleaned and hot dip zinc galvanized in accordance with ASTM A 123. Reinforcing steel used in inlets and manholes shall be ASTM A 615 grade 40.

Junction Box
Payment shall be made at the negotiated unit price each for "Replace/Repair Junction Box". The price shall be full compensation for excavation (including rock if necessary), backfill, steps, castings, concrete, reinforcing steel, and other materials necessary to complete the work. Reinforcing steel
used in inlets and manholes shall be ASTM A 615 grade 40. The negotiated unit price will be with the applicable delivery order and thereafter included in the unit price list at the negotiated unit price bid.

Additional Depth
Additional payment shall be made at the negotiated unit price per foot for Curb Inlet additional depth, Area Inlet additional depth, and Junction Box additional depth for depths greater than 8' for each specified size and type of structure. The negotiated unit prices will be with the applicable delivery order and thereafter included in the unit price list at the negotiated unit price bid.

Reconstruction of existing structure walls or tops to match proposed elevations or for connection to proposed storm sewer systems shall not be paid for directly, but shall be considered subsidiary to other bid items in the contract.

S-29 CONCRETE COLLAR
Storm sewer joints shall be encased in a concrete collar at locations determined by the Engineer. Minimum encasement, if none is detailed, shall consist of 6" JCCB 4K concrete, which shall extend a minimum of 1.5' past each side of the joint. Reinforcement shall consist of a cage of #4 bars at 6" centers longitudinally, and 3-#4 bars transverse to the pipe centerline.

S-29.1 Measurement and Payment
Concrete Collar construction shall be paid for at the contract unit price bid per each for "Replace/Repair Pipe Collar".

S-30 PIPE CONNECTION
When connecting 6" diameter or smaller pipe to an existing structure, Contractor shall make a neat hole of sufficient size to pass the pipe completely through the inlet wall. Connection shall be grouted so as to be water tight. Excess pipe shall be trimmed to be nearly flush with the interior inlet wall.

S-30.1 Measurement and Payment
Pipe Connections shall be paid for at the contract unit price bid per each for "Install Pipe connection at Inlet".

S-31 STONE RIPRAP
This work shall consist of furnishing and placing a layer of stone riprap on properly compacted sub-grade for protection of the channel slopes. Riprap shall be placed to reasonably conform to the lines and grades determined by the Engineer.

S-31.1 Materials
Stone for riprap shall be sound durable limestone free from cracks, seams, shale partings, and overburden spoil. Deleterious substances, which include soft friable particles, objectionable materials, and other foreign matter, shall not exceed 5 percent by weight. Geo-textile, if specified,

shall meet the requirements of Subsection 1710 of the Standard Specifications, unless modified by the Engineer.

S-31.2 Gradation
Stone for riprap shall conform to the requirements of Section 1116, for the designation as indicated by the Engineer.

S-31.3 Placement
Slope protection work shall not begin until all construction within the channel and all channel grading is complete and approved.

Riprap shall be placed to its full layer thickness in one operation and in such a manner as to minimize segregation and avoid displacing the underlying material. The finished surface of riprap shall blend smoothly into surrounding slope lines.

Riprap placing procedures shall result in a reasonable distribution of the stone from the largest to the smallest sizes, free from clusters of the large stones and pockets of the small stones. Placement shall begin at the bottom and proceed up the slope in a progressive manner. Dumping of stone at the top of the slope and rolling into place will not be permitted. Moving stone by drifting and pounding of rock into place will not be permitted. Final finishing of the slope shall be done as the material is being placed. Hand placing shall be employed to the extent necessary to secure the results specified herein.

The Contractor shall maintain the riprap protection until accepted by the Engineer and any material displaced by any cause shall be replaced at his expense to the requirements specified herein.

S-31.4 Measurement and Payment
Riprap shall be measured by the Ton of materials acceptably placed. No measurement will be made of any excavation, backfill, filter fabric, or other appurtenances necessary to complete the work. Riprap shall be paid for at the negotiated unit price per Ton for the specified class, per the Standard Specifications. The negotiated unit price for riprap will be with the applicable delivery order and thereafter included in the unit price list at the negotiated unit price bid for each class.

S-32 AGGREGATES
All aggregates installed shall conform to Section 1100 of the Kansas Standard Specifications

S-32.1 Measurement and Payment
Aggregate will be measured by the Ton for each designation supplied and will be full compensation for delivery, placement, spreading, compaction, and any other work necessary to completely install. Aggregate shall be paid for at the negotiated unit price per Ton for each designation supplied. The negotiated unit price for aggregate will be with the applicable delivery order and thereafter included in the unit price list at the negotiated unit price bid for each class.

S-33 DITCH LINING, CONCRETE
This work shall consist of the construction of concrete ditch lining, in accordance with Section 810.07 of the Standard Specifications and as directed by the Engineer.

The subgrade for the ditch lining shall be excavated to a smooth surface parallel to the proposed finished surface and to a depth sufficient for the full thickness of the lining. Soft, unstable subgrade material shall be removed and replaced with suitable materials. The subgrade shall be firm and well compacted.

S-33.1 Measurement and Payment
Payment for ditch lining shall be made at the contract unit price for "Replace/Repair Concrete Ditch Liner" per square foot of the specified thickness. Measurement shall be made on the inside face of walls and top surface of the base slab.

S-34 UNDERDRAIN
Underdrain shall be constructed, at locations determined by the Engineer, in accordance with Section 818 of the Standard Specifications. All materials shall meet the requirements of Section 1900 of the Standard Specifications, except as modified herein. Under no circumstances shall Type H Pipe be installed within the same underdrain system as Type L Pipe or Prefabricated Edge Drain.

S-34.1 Pipe Underdrain
Pipe underdrain shall be Type H, PVC Corrugated Sewer Pipe with smooth interior and fittings in accordance with ASTM F 949, or, Type L, Corrugated Polyethylene Drainage Pipe in accordance with AASHTO M 252M.

S-34.2 Outlet Pipe
Outlet pipe shall be Type K, PVC Corrugated Sewer Pipe with smooth interior and fittings in accordance with ASTM F 949, or, Type E, Corrugated Polyethylene Drainage Pipe in accordance with AASHTO M 252M.

S-34.3 Joints
All joints shall be installed in accordance with the manufacturer's instructions. The Contractor shall submit certified test results that the mechanical joints with elastomeric seals meet the requirements of ASTM D 3212 and ASTM F 477.

S-34.4 Perforations
Type H pipe shall be perforated in accordance with ASTM F 949. Type L pipe shall be perforated in accordance with AASHTO M 252M.

S-34.5 Measurement and Payment
Payment for this work shall be made at the contract unit price bid per lineal foot for "Underdrain Pipe" of the specified size. Outlet pipe shall be paid at the negotiated unit price per lineal foot of the specified size. The negotiated unit price for Outlet pipe will be with the applicable delivery order and thereafter included in the unit price list at the negotiated unit price bid.

S-35 PRECAST CONCRETE BOX CULVERT
This item shall include construction using precast reinforced concrete box barrels. Precast reinforced concrete culvert barrels shall be furnished in accordance with the requirements of ASTM C 850 for less than 2 feet of cover with live loads and ASTM C 789 for greater than 2 feet of cover. The minimum design shall be based on AASHTO HS-20 loading and a 28 day compressive strength of 4,500 p.s.i., and all barrels shall be designed to accommodate the construction loads. Specific design requirements for culvert barrels shall be as indicated by the Engineer. Reinforcing steel shall be Grade 60 in accordance with Section 704 of the Standard Specifications and shall meet the

requirements of these specifications as described in "CONCRETE CONSTRUCTION", and "REINFORCING STEEL". Shop drawings and design calculations sealed by a registered professional engineer shall be required for precast sections.

A minimum length section of the R.C.B. adjacent to special structures shall be poured in place with the special structure. This section length shall be as determined by the Engineer. The end barrel segments of the precast R.C.B. will be constructed with a key and tie steel of an adequate length and bar size for a lap with the structure.

Pipe and structure blockouts shall be cast into the R.C.B. barrel sections at the locations determined by the Engineer, with the reinforcing steel running through the blockout to be cut out in the field. Extra reinforcement as per the plans or as designated by the precast design shall be installed around the blockout and shall be so indicated on the shop drawings. The Contractor may elect to saw blockouts in the field as allowed or required by the design.

Excavation and backfill for precast culverts shall be in accordance with the requirements of these specifications as described in "EXCAVATION", and in accordance with the Section 207 of the Standard Specifications. A granular bedding of the thickness indicated by the Engineer shall be placed to provide an even surface of uniform density. The placing of precast barrel segments shall be started at the outlet end, with barrel segments placed with ends tightly abutting and true to line and grade. Barrel segments shall be match cast to each other or shall be otherwise formed at the joints with such precision as to limit joint openings in the installed position to not more than 3/4 inch wide. Designed joint pulls to achieve the required line and grade shall be limited to 1 1/2 inches. The completed barrel shall form a smooth uniform invert. The space between parallel segments in a multiple R.C.B. shall be filled with grout or aggregate backfill, as indicated by the Engineer. Filter fabric shall be placed on top of the box segments over the space between parallel segments. An approved mastic joint filler shall be applied to the joints prior to placement of the barrel segments.

This mastic shall be applied to the bottom of each segment and shall extend one third of the inside distance up each wall. All precast barrel joints shall be wrapped in an external sealing band meeting the requirements of ASTM C 877 and installed in accordance with the manufacturers requirements.

Equalization blockouts between parallel barrel segments shall be as indicated by the Engineer. The Contractor may utilize alternate methods of constructing the connection between barrels of parallel segments, including cast in place construction, as approved by the Engineer.

Weepholes shall be placed in the midpoint of each box section. Weephole design shall be as approved by the Engineer.

S-35.1 Measurement and Payment

Payment for this work shall be made at the negotiated unit price bid per lineal foot for "Replace/Repair Precast R.C.B." of the specified size for the applicable delivery order and thereafter included in the unit price list at the negotiated unit price bid.

S-36 SANITARY SEWERS

S-36.1 Location and Grade of Sewers

All sewer construction shall be in accordance with the Overland Park Municipal Code, and shall additionally be in accordance with requirements of the jurisdiction listed herein. All sewers, structures and appurtenances shall be located as determined by the Engineer. The grade and alignment of the pipe shall be determined and maintained from tacked offset stakes located alongside the trench upon which cuts and elevations have been established by the Contractor. Pipe alignment during construction shall be maintained by the use of laser alignment equipment.

S-36.2 Pipe Materials

All sanitary sewer pipe specified in the plans shall be PVC sewer pipe in accordance with the requirements of ASTM D 3034, classified as SDR-26, or ABS sewer pipe in accordance with the requirements of ASTM D-1527-77, classified as Schedule 40. All PVC joints shall be mechanical joints with elastomeric seals conforming to ASTM D 3212. All ABS joints shall be solvent-cemented in accordance with ASTM D 2235. All joints shall be installed in accordance with the manufacturer's instructions.

Ductile iron pipe shall be minimum thickness Class 50 in accordance with ASTM A 746 and ASTM D 1248. All D.I.P. joints shall be push on joints in accordance with ANSI A-21.11.

S-36.3 Maintenance

The Contractor shall be responsible for keeping all debris and waste material out of sewers during sanitary sewer construction. Should any waste material, debris, earth or other foreign material enter sewers during adjustments or other construction operations, the Contractor shall be responsible for removal of such material and shall maintain sewer flow at all times.

S-36.4 Cleanouts

The Contractor shall install cleanouts at all bends in sanitary lateral relocations. Cleanouts shall be of the same size pipe as the lateral, and shall extend to grade. No fittings with a greater bend than 45 degrees shall be used in construction of the cleanout system. Cleanouts shall be considered subsidiary to “Sanitary Lateral Relocation”.

S-36.5 Jurisdiction

Sanitary Sewer construction shall be in accordance with the “Construction and Materials Specification” as prepared by the Johnson County Unified Wastewater Districts, and on file with the State of Kansas, Department of Health and Environment, Permit No. 20969.

All sanitary sewer service line work shall conform to requirements of the Johnson County Unified Wastewater Districts Service Line Design and Construction Standards, and the most recent edition of the BOCA National Plumbing Code.

S-36.6 Measurement and Payment

Sanitary sewer pipe shall be measured by the lineal foot of the specified size. Payment shall be made on the amount of completed and accepted work at the negotiated unit price bid per lineal foot for "Sanitary Lateral Relocation", of the specified size and type, in the lengths approved by the Engineer. Prices shall be full compensation for excavating (including rock if necessary), bedding, backfill, construction of ground water interruption barriers, cleanouts, and for furnishing all materials and fittings necessary to complete the work and shall include all costs in modifying the

existing structures affected by this work. The negotiated unit price will be with the applicable delivery order and thereafter included in the unit price list at the negotiated unit price bid.

S-37 SANITARY SEWER ENCASEMENT

Sanitary sewers at locations indicated by the Engineer shall be encased with a minimum of 6" JCCB 4K concrete. This encasement shall extend a minimum of 5' past each side of the storm sewer, and shall terminate within 6" of a joint in the sanitary sewer line, as approved by the Engineer.

All encasement of the sanitary sewer lines shall be in accordance with the requirements of the Johnson County Unified Wastewater Districts.

S-37.1 Measurement and Payment

Payment for sanitary encasement shall be made at the negotiated unit price bid per lineal foot for "Sanitary Sewer Encasement" with the applicable delivery order and thereafter included in the unit price list at the negotiated unit price bid.

S-38 FENCING

At the locations shown on the plans or directed by the Engineer, woven wire, chain link, wood privacy, or other types of fence shall be removed and replaced or installed in accordance with Section 806 of the Standard Specifications.

All corner posts assemblies, line post assemblies and connectors shall be considered incidental to the fence construction.

All fences and gates within the construction easements and necessary to be removed for construction of the project shall be removed by hand and stored on the lot adjacent to the fence. Fence posts may be removed by machine provided there is no resulting damage to sound posts. The Contractor, along the lines designated by the Engineer, after construction is completed shall rebuild fences in a condition equal to or better than that prior to removal.

All material, which is damaged during removal, storage, or reinstallation, shall be replaced at the Contractor's expense with new material similar to that which was removed.

S-38.1 Gates

Gate construction shall follow the details as set forth by the Engineer. The material used for gates shall be in accordance with Section 1619 of the Standard Specifications. Gateposts shall be 3 inch outside diameter with a minimum weight of 5.79 lb./ft. All gates shall have heavy-duty gate hinges, and all hinges and latch designs shall be submitted for approval by the Engineer. Single gates shall have standard gate latches, and double gates shall have standard double drive gate drop rod assemblies with center stop and concrete footings.

S-38.2 Privacy Fence

All material used for construction of wood privacy fencing shall be brand new, and shall be of a quality at least equal to that fence being replaced when it was new. As a minimum requirement, all line posts shall be 4" square, corner posts shall be 6" square, and all posts and rails shall be CCA treated. All posts shall be set in concrete, the concrete shall be left 4" below grade, and the top of the concrete base shall be sloped away from the post. Rails shall be 2" x 4" dimension CCA treated lumber. Facing material shall be as directed by the Engineer. Typical facing shall be 4" wide dog eared cedar planks, except that facing shall be 6" wide if the existing fence facing was 6" wide. All

privacy fencing, shall be constructed with galvanized ring shank nails, staples are not permitted.

The Contractor shall install temporary fencing wherever existing fencing is removed for construction, or where requested by the Engineer. The temporary fencing shall skirt the edge of the construction area and tie into existing fencing. Temporary fencing shall not extend outside the indicated easements.

Increased length of reinstalled fence directed by the Engineer shall be paid for at the negotiated unit price bid per linear foot of "Fence" as applicable. The negotiated unit price will be with the applicable delivery order and thereafter included in the unit price list at the negotiated unit price bid.

S-38.3 Measurement and Payment
Payment for this work shall be made at the negotiated unit price bid per lineal foot for "Fence", of the specified size and type, with the applicable delivery order and thereafter included in the unit price list at the negotiated unit price bid.

All temporary fence installation shall not be paid for directly, but shall be considered subsidiary to other bid items in the contract.

Payment for gates shall not be paid for directly, but shall be paid for at the unit price bid per lineal foot for “Fence,” of the specified size and type.

S-39 TRAFFIC CONTROL
Traffic Control shall conform to the applicable requirements of Section 821 of the Standard Specifications, as modified herein. Construction operations shall be coordinated to result in the least practicable delay to traffic. Payment for traffic control shall not be paid for directly but shall be subsidiary to other bid items in the contract.

S-39.1 Requirements
The Contractor shall furnish and maintain adequate signs, barricades, warning lights, and all other equipment necessary to direct and reroute traffic in a safe and effective movement for through traffic; through and around the work area. The Contractor shall furnish all flaggers and other personnel necessary to provide the required traffic control.

S-39.2 Placement
Traffic control devices, barricades, and signs shall be installed at the inception of construction. The traffic control devices, barricades, and signs shall be properly spaced and properly maintained and/or operated during the time construction and/or special conditions exist on the project. When construction requires machinery or men to be in an intersection, barricades shall be placed and a flagger shall control the intersection traffic. If the intersection has left turn lanes, the left turn lane shall be closed using the required signing and barricades.

S-39.3 Removal
No barricades and/or signs shall be removed from an overlaid street until the surface temperature has cooled such that no marks will occur in the street surface or with the approval of the Engineer, to

remove the barricades and/or signs. New curbs, including driveways, shall be barricaded from all traffic until the concrete has attained sufficient strength to prevent damage.

S-39.4 Access
Streets with no other outlet shall be open to traffic at all times. Access to private driveways shall be maintained insofar as possible. Businesses with two driveways shall have only one driveway closed at one time. Contractor shall provide access to businesses and residents with only one driveway at all times.

S-35.5 Payment
Traffic Control will not be paid for directly, but shall be subsidiary to other bid items in the contract.

S-40 TRAFFIC SAFETY
When working in the traveled way, the Contractor shall provide adequate and suitable barriers, signs, warning lights, flaggers, and all other equipment necessary to direct and reroute traffic and protect the public from moving or stationary vehicles, equipment, and materials, and other obstructions. Also, adequate protective warning lights and signs shall be provided to warn of any obstruction or excavation in the street, and easement area. All barricades, signs, lights and other protective devices
in public right-of-way and easements shall be installed and maintained in conformity with applicable statutory requirements, the latest edition of the "Manual on Uniform Traffic Control Devices", and the "Overland Park Traffic Control Handbook for Street Maintenance and Construction Operations".

The Police Department, Fire Department, and Med-Act shall be notified prior to closing a street with the approval of the City Engineer.

S-40.1 Payment
Traffic Safety will not be paid for directly, but shall be subsidiary to other bid items in the contract.

S-41 LANDSCAPING
The Contractor shall provide landscaping to restore the project site as close as possible to its pre-construction condition. Landscaping shall include the replanting or replacement of trees, shrubs, bushes, flowers or any other plantings, landscape timbers, rocks used as borders or any other landscape material shown on the Contract Plans or designated by the Engineer that was not salvaged by the property owner.

S-41.1 Saving Existing Landscaping
Contractor shall have the option of saving existing plantings and undamaged landscape materials during construction for replanting or replacement after construction. Any trees, shrubs, or bushes removed during construction that die or appear unhealthy at the end of the one-year maintenance period shall be replaced with new nursery stock.

S-41.2 Nursery Stock Selection
When nursery stock is to be used, the property owner shall be notified, 15 days prior to planting, of the name and location of the nursery supplying the replacement plantings. The property owner shall be given the opportunity to select the specific stock to be planted of the type and size as indicated by the Engineer. If the property owner does not select the nursery stock, the Contractor shall select the stock subject to final approval by the Engineer.

Unless otherwise indicated by the Engineer, all trees removed shall be replaced with the same species; 2 - 2 1/2" in diameter, and staked as directed by the Engineer.

S-41.3 Out-of-Season Plantings
For those plantings out-of-season or unavailable at the time of project acceptance, the Contractor shall provide a credit in the name of the property owner at the nursery of the Contractor's choice to be used by the property owner when the plantings become available. The amount of the credit shall equal the cost of purchasing the unavailable items in the quantities listed herein. The installation of the plantings shall be the responsibility of the property owner, except the installation of trees shall be included in the above described credit and performed by the selected nursery.

S-41.4 Payment
This work shall not be paid for directly, but shall be subsidiary to other bid items in the contract.

S-42 TREE AND PLANT PROTECTION
All trees and other vegetation, which must be removed to perform the work, shall be removed and disposed of by the Contractor; however, no trees or cultured plants shall be unnecessarily removed unless their removal is indicated by the Engineer. All trees and plants not removed shall be protected against injury from construction operations.

The Contractor shall take extra measures to protect trees, designated to be preserved, such as erecting barricades or fences around the drip line, and trimming low hanging branches to prevent damage from construction equipment. When installing a pipe, or any other work that may damage the tree, hand excavating or tunneling methods shall be used. Such trees shall not be endangered by stockpiling excavated material or storing equipment within the drip line. Without prior consent from the Engineer, no backfill material exceeding 4 inches in depth shall be placed within the drip line area of any tree designated to be preserved.

When excavation is required within the drip line of any protected tree, the Contractor shall take extra measures to protect as many roots as possible. All roots to be cut or removed shall be "cut" with a chain saw, trencher, or other methods as approved by the engineer that will leave a smooth cut surface. All roots exposed during excavation shall be protected to prevent the roots from drying out by covering the exposed area with canvas or burlap, peat moss, or mulch, and kept damp until the area has been backfilled. Trees requiring root removal of one third or more of the circumference of the root system, shall be pruned an equal amount. This pruning shall consist of removing limbs on the opposite side of the root removal or thinning the entire tree equally as directed by the Engineer. Qualified nurserymen or arborists shall perform all pruning, repair, and replacement of trees and plants. Trees requiring trimming are at the direction of the Engineer and shall not be paid for directly, but shall be subsidiary to other bid items in the contract.

When the injury or removal of trees designated to be preserved cannot be avoided; each tree injured beyond repair or removed shall be replaced with a similar tree, or provide compensation to the City as determined by the Engineer.

S-42.1 Payment
Tree and planting protection will not be paid for directly, but shall be subsidiary to other bid items in the contract.

S-43 LAWN SPRINKLER SYSTEM

This work shall consist of installation and repair of lawn sprinkler systems within the project limits. All sprinkler system installation shall be by a qualified company with adequate experience in sprinkler system installation, as determined by the Engineer. The installer shall submit shop drawings of sprinkler head locations and watering zones for approval by the Engineer prior to installation or repair of the system. All lawn sprinkler systems shall be designed to prevent damage due to freezing weather, by depth, self-draining devices, or other methods as approved by the Engineer.

S-43.1 Payment
All lawn sprinkler system repair or installation shall not be paid for directly but shall be subsidiary to other bid items in the contract , which shall include all excavation, compaction, piping, sprinkler heads, wiring, sensors, and other appurtenances necessary to make a fully operational sprinkler system.

S-44 TEMPORARY EROSION AND POLLUTION CONTROL
The Contractor shall utilize temporary erosion control methods on the project site to prevent mud/debris from entering the portions of the roadway open to traffic, to prevent mud/debris from entering the completed storm sewer system, and to prevent damage to yards of existing occupied residences. Temporary Erosion Control shall conform to Section 904 of the Standard Specifications and Special Provision 90M-151-R6. The forms of temporary erosion control to be used shall include but not be limited to construction of temporary cutoff ditches and installation of staked straw bales, temporary hydro seeding, and erosion control fabrics.

S-44.1 Payment
This work shall not be paid for directly, but shall be subsidiary to other bid items in the contract.

S-45 SODDING
This work shall consist of furnishing and placing sod at those locations designated by the Engineer in accordance with Section 905 of the Standard Specifications except as modified herein. All equipment used in sodding shall be in accordance with Section 901 of the Standard Specifications except as modified herein.

S-45.1 Sod Types
The type of sod to be used will be Kentucky Bluegrass sod, except where Zoysia sod or Turf Type Fescue sod shall be identified under the property owners name and address as designated by the Engineer. In the case of mixtures of Bluegrass and Zoysia sod, Zoysia shall be used unless otherwise directed by the Engineer.

S-45.2 Sod Material
All materials shall conform to the requirements of these Specifications and to Section 2107 of the Standard Specifications. The Contractor shall retain a person knowledgeable of the different types of sod to ascertain prior to bidding, the location and types of existing sods. Sod shall be of best quality Bluegrass, Zoysia, or Turf Type Fescue, not more than two years old, shall conform to the quality standards of Nursery Grown Sod as defined by the American Sod Producers Association, and shall meet the following standards:

a. Thickness of Cut: Sod shall be machine cut at a uniform soil thickness of 5/8 inch, plus or minus 1/4 inch, at the time of cutting. Measurement for thickness shall

exclude top growth and thatch.

b. Pad Size: Individual pieces of sod shall be cut to the supplier's standard width and length as approved by the Engineer. Maximum allowable deviation from standard widths and lengths shall be plus or minus 1/2 inch on width and plus or minus 5 percent on length. Broken pads and torn or uneven ends will not be acceptable.

c. Strength of Sod Sections: Standard size sections of sod shall be strong enough to support their own weight and should retain their size and shape when suspended vertically from a firm grasp on the upper 10 percent of the section.

d. Moisture Content: Sod shall not be harvested or transplanted when moisture content (excessively dry or wet) will adversely affect its survival.

e. Mowing Height: Before stripping, sod shall be mowed uniformly at a height of 2 to 3 inches.

f. Thatch: Sod shall be relatively free of thatch, up to 1/2 inch allowable (uncompressed).

g. Diseases, Nematodes, and Insects: Sod shall be reasonably free of diseases, nematodes, and soil-borne insects. State nursery and/or plant materials' laws require that all sod entering inter-state commerce be inspected and approved for sale. The same applies to sod being shipped intra-state. The inspections and approval must be made by the state agricultural department, office of the state entomologist.

h. Weeds: Sod shall be free of objectionable grassy and broad leaf weeds. Sod shall be considered free of such weeds if less than 5 such plants are found per 200 square feet of area. Sod will not be acceptable if it contains any of the following weeds: quackgrass, Johnson grass, poison ivy, nutsedge, nimblewill, Canada thistle, bindweed, wild garlic, ground ivy, perennial sorrel, bromegrass, bentgrass, and Bermuda grass.

S-45.3 Fertilizer

Fertilizer shall be of an approved commercial brand composed of "slow release nitrogen", 4-1-2 formula or similar, such as 18-5-9, for Kentucky Bluegrass and Fescue, 25-5-10 for Zoysia, shall conform to the State fertilizer laws, and shall conform to Section 2106 of the Standard Specifications.

Furnishing and placing fertilizer shall be in accordance with Section 907 of the Standard Specifications. Fertilizer shall be uniform in composition, dry and free flowing, and shall be delivered to the site in the original unopened containers, each bearing the manufacturer's guaranteed analysis. Any fertilizer, which becomes caked or otherwise damaged, making it unsuitable for use, will not be accepted. Fertilizer shall be placed prior to sodding at not less than 1 Lb. of pure nitrogen per 1000 square feet of sodding area. Fertilizer shall be subsidiary to sodding bid items.

S-45.4 Sod Season

Bluegrass and Fescue sod may be planted during the periods of March 1 to May 15 and September 1 to November 15. Bluegrass and Fescue sod may be planted during the period, November 15 to

March 1, when the soil and sod is workable and with the approval of the Engineer. If sod is planted between November 15 and March 1, the Contractor will maintain the sod until 20 days after the beginning of the spring sodding season. The Engineer reserves the right to delay the sodding of all types of sod or to vary the permissible sodding seasons, due to weather, soil conditions, or for other causes.

Zoysia sod may be planted during the period April 1 to October 15.

S-45.5 Bed Preparation and Moisture Requirements
Where the width of the disturbed area to be sodded exceeds 18", the area shall be widened to a uniform size by removing enough existing turf from behind the disturbed area, creating an area whose width is a multiple of 18" (width of sod roll). A clean edge should be established at the outer limits of the area to be sodded, so that good contact can be made between the new sod and the established turf.

Where the width of the disturbed area is less than 18", enough existing turf shall be removed to create an area of uniform width, no less than six (6") inches.

All backfill shall consist of soil suitable for vegetation. The area shall be prepared such that sodding can be placed on bare soil. This will consist of cultivating, smoothing, removing of clods, surface stones 1" in diameter or larger, and weeds. All backfilling shall be subsidiary to other bid items.

Area to be sodded shall consist a minimum of 6"-8" of topsoil, free from clods, rocks, trash, and other debris. If the area has been severely compacted by heavy trucks or other equipment, it shall be cultivated to a depth of 6"-8" by tilling or disking. Backfill areas shall be compacted to a sufficient density to prevent excessive settling after placement of sod. If footprints left by an adult walking across the area are more than 1/2" deep, the compaction is not sufficient.

Grade of the area shall be approximately 1" below desired final grade, to allow for the thickness of the sod.

S-45.6 Water
Water used in this work shall be furnished by the Contractor and will be suitable for irrigation and free from ingredients harmful to plant life. The Contractor shall furnish all watering equipment required for the work. Under no circumstances shall the Contractor use water except that metered from adjacent fire hydrants or public water lines.

S-45.7 Placing Sod
Sod strips shall be laid parallel with the ends staggered in a running bond pattern. Each successively laid strip shall be pressed firmly up against the one next to it or up against the edge of the existing turf, to ensure good contact with no overlapping. Sod shall be staked in places where the slope exceeds 3:1. Sod shall be staked with a minimum of two to four stakes per square yard or roll, as determined by the Engineer. Stakes shall be of lath or similar materials and shall be driven six inches into the ground, leaving approximately 1/2 inch of the top above the sod line.

After placing sod, the area shall be tamped with a hand tamp or rolled with a lawn roller half filled with water. Rolling shall be done in a direction perpendicular to the direction in which the sod lengths were laid.

S-45.8 Sod Watering and Maintenance

After each days sod is placed, it shall be watered sufficiently to wet the sod pads and at least 2 inches of the sod bed. Thereafter in the absence of adequate rainfall, watering shall be performed daily and as often as necessary to keep the sod pads moist at all times. Watering by the Contractor shall continue until the roots of the sod are anchored in placed, and the sod is growing and accepted.

All sodded areas shall be mowed immediately prior to the Engineer's inspection for acceptance. Mowing is required to facilitate visual assessment and acceptability of the work. Mowing shall not be attempted until the sod is firmly rooted and secure in place. Not more than 1/3 of the grass leaf shall be removed. Any debris that would interfere with mowing shall be collected and removed.

S-45.9 Sod Acceptance

All sodded areas shall be kept thoroughly watered by the Contractor for a period of 20 days after laying and as often as required thereafter, until completion of other items of work in the contract. If sodding is the last item of work to be performed, the Contractor shall continue watering until all sod is growing and accepted.

The Contractor shall be fully responsible for the condition of the sod work until written notification that his obligation to maintain the sod is terminated, and the sod has been accepted. At that time the Engineer shall notify the property owners that further maintenance of the sod is their responsibility.

S-45.10 Payment

All sodding shall be paid for at the negotiated unit price per square yard of the specified type, which shall include full compensation for bed preparation, transporting, placing, firming, watering, cultivating, and maintaining the sod for the time determined by the Engineer. The negotiated unit price will be with the applicable delivery order and thereafter included in the unit price list at the negotiated unit price bid.

S-46 TOPSOIL

Topsoil shall be furnished and placed at the locations as directed by the Engineer. Topsoil shall consist of suitable surface soil as stipulated in Section 2109 of the Standard Specifications and as approved by the Engineer. Furnishing topsoil shall be in accordance with Section 906 of the Standard Specifications.

The Contractor shall make every reasonable effort to stockpile existing topsoil prior to deep excavations and reuse it in the same general locations. No payment will be made for topsoil furnishing and placement necessary due to excessive hauling off of existing topsoil on the project site.

S-46.1 Payment

This work shall not be paid for directly, but shall be subsidiary to other bid items in the contract, which shall include furnishing, hauling, stockpiling if required, removing unsuitable soils, scarifying if required, and placement. No payment will be made for offsite topsoil acquisition and placement.

S-47 PRUNING

Trees and shrubs within or overhanging into the easements that will be damaged during the construction operations shall be pruned in accordance with the requirements of Section 909 of the Standard Specifications. Pruning should be done only where absolutely necessary and no trees shall be pruned without prior approval of the Engineer. When directed by the Engineer, trees requiring

root removal of one third or more of the circumference of the root system, shall be pruned an equal amount. This pruning shall consist of removing limbs on the opposite side of the root removal or thinning the entire tree equally as directed by the Engineer. Qualified nurserymen or arborists shall perform all pruning, repair, and replacement of trees and plants.

S-47.1 Payment
Pruning shall not be paid for directly, but shall be subsidiary to other bid items in the contract.

S-48 CONTRACTOR CONSTRUCTION STAKING
This work shall be performed in accordance with Section 819 of the Specifications, as amended herein. The Contractor shall set construction stakes establishing all lines, slopes, continuous profile-grades, centerlines, and benchmarks necessary to control and perform the work.

The Contractor shall locate all existing property corners within the project limits prior to commencing construction. All property corners that can be saved shall be marked and protected. Property corners anticipated to be disturbed during construction shall be located by ties and shall be reset by the Contractor at the termination of construction activities. A qualified land surveyor registered in the State of Kansas shall perform all property surveying.

The Contractor shall set cut stakes for all rough swale grading and shall maintain or reset such stakes for checking of the grade as required by the Engineer. Final grade for the swales and berms shall be established by "blue top" surveying or other approved method, and grade devices shall be maintained for inspection by the Engineer prior to sodding.

S-48.1 Payment
This work shall not be paid for directly, but shall be subsidiary to other bid items in the contract.

S-49 HORIZONTAL BORING
All horizontal boring work shall conform to requirements of the City of Overland Park, Kansas, Right-of-way Permits, and Horizontal Directional Drilling Guidelines Handbook.

S-49.1 Payment
Horizontal boring shall be made at the contract unit price per lineal foot for “Horizontal Boring for Pipe Connection”.