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**DIVISION 900
ROADSIDE IMPROVEMENT, PLANTING AND SEEDING**

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901 - TEMPORARY EROSION AND POLLUTION CONTROL

SECTION 901

TEMPORARY EROSION AND POLLUTION CONTROL

901.1 DESCRIPTION

Install, maintain and remove temporary erosion and pollution control devices as required during the construction of the project.

BID ITEMS

Temporary Berm
Temporary Slope Drain
Temporary Slope Barrier (Set Price)
Temporary Ditch Check
Temporary Ditch Check (Rock) (Set Price)
Temporary Inlet Sediment Barrier
Temporary Sediment Basin
Temporary Stream Crossing
Sediment Removal (Set Price)
Temporary Fertilizer (**)
Temporary Seed (****)
Soil Erosion Mix
Temporary Seeding
Erosion Control (*)
Mulching (Temporary)
Mobilization (Emergency Erosion Control) (Set Price)

UNITS

Linear Foot
Linear Foot
Linear Foot
Linear Foot
Cubic Yard
Each
Cubic Yard
Each
Cubic Yard
Pound
Pound
Pound
Lump Sum
Square Yard
Acre
Each

* Class & Type

** Type of Fertilizer

*** Type

901.2 MATERIALS

a. Provide sediment barriers, fertilizers, seeds, soil erosion mix, erosion control materials and mulch that comply with **DIVISION 2100**.

Provide aggregate that complies with aggregate ditch lining, $D_{50} = 6$ inches, **DIVISION 1100**. Existing aggregate from the project may be used under this specification, provided all applicable physical requirements are met.

b. Straw or Hay Bales. Provide straw or hay bales that are free of weeds declared noxious by the Kansas Department of Agriculture. Provide bales bound with twine. Do not use bales bound with wire.

The Engineer will accept the straw or hay bales based on **DIVISION 2100**.

c. Temporary Slope Drain. Provide metal pipe, plastic pipe or flexible rubber pipe for temporary slope drains.

The Engineer will accept the material for temporary slope drain based on the condition of the pipe and visual inspection of the installed drain.

d. Biodegradable Logs. Provide commercially available biodegradable logs manufactured from rice straw, excelsior wood fiber, coconut fiber, jute or other biodegradable material bound with an open mesh fabric of jute or light-weight plastic.

The Engineer will accept the biodegradable logs based on compliance with dimensional and other requirements shown in the Contract Documents, and visual inspection of the installed material.

e. Geo-Ridge Permeable Berm™ or equivalent. The Environmental Scientist (Bureau of Design, Environmental Services Section) will consider an equivalent of the brand name specified. Provide the Engineer with a complete description, literature, test reports, etc. on the proposed equivalent.

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The Engineer will accept the Geo-Ridge Permeable Berm™ (or an equivalent approved by the Environmental Scientist) based on brand name and visual inspection of the installed material.

f. Triangular Silt Dike™ or equivalent. The Environmental Scientist (Bureau of Design, Environmental Services Section) will consider an equivalent of the brand name specified. Provide the Engineer with a complete description, literature, test reports, etc. on the proposed equivalent.

The Engineer will accept the Triangular Silt Dike™ (or an equivalent approved by the Environmental Scientist) based on brand name and visual inspection of the installed material.

901.3 CONSTRUCTION REQUIREMENTS

a. Responsibility. Take all measures necessary to prevent erosion and pollution on the project and project related borrow areas.

If the contract does not include temporary erosion and pollution control bid items, and such work is required, items will be added as provided for in **subsection 104.8**.

Use KDOT's Temporary Erosion Control Manual as a guide for the design, installation and maintenance of temporary erosion control measures.

Install erosion control devices according to the approved erosion control schedule prior to or simultaneously with the clearing and grubbing operations. Do not perform grading until erosion control devices are in place as approved by the Engineer. Install devices to establish a perimeter control of the project in areas where it is anticipated that storm water runoff will leave the project.

Update the erosion control schedule as work progresses to show changes due to revisions in work schedules or sequence of construction, or as directed by the Engineer. Update the site map to reflect erosion control devices that have been installed.

As a minimum, perform the following erosion control actions:

- Use temporary erosion and pollution control actions to control erosion resulting from the construction of the project;
- Use temporary erosion and pollution control measures to prevent contamination of adjacent streams or other watercourses, lakes, ponds or other areas of water impoundment;
- Coordinate temporary erosion and pollution control measures with the construction of permanent erosion control features to provide continuous erosion control;
- Schedule construction of drainage structures and permanent erosion control features as soon as practical; and
- Initiate temporary erosion and pollution control measures for areas that have been disturbed, within 14 calendar days after construction activities have temporarily or permanently ceased on a portion of the project site. Exceptions are as follows:
 - If implementation of erosion and pollution control measures is precluded by snow cover, undertake such measures as soon as practical.
 - If construction activities will resume on the portion of the project site within 21 calendar days, temporary erosion and pollution control measures do not have to be initiated.
 - In arid regions (average annual rainfall of less than 10 inches), during seasonal arid conditions, implement the erosion and pollution control measures as soon as practical, but not necessarily within 14 calendar days.

Update the erosion control schedule as work progresses to account for changes due to revisions in work schedules or sequence of construction, or as directed by the Engineer. Update the site map to reflect erosion control devices that have been installed.

b. Permits. KDOT (or the local governmental agency) will obtain a National Pollutant Discharge Elimination System (NPDES) permit for projects with 1 acre or more of erodible surface. When Contractor-furnished borrow is required, obtain all required permits and clearances required for compliance, **subsection 107.2**.

A NPDES permit is not required for a project with less than 1 acre of erodible surface. The Contractor is not required to submit an erosion control schedule. The Contractor is required to comply with the concepts for erosion and pollution control presented in KDOT's Storm Water Pollution Prevention Plan (SWPPP), see **subsection 901.3d**.

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c. General. Unless approved in writing by the Engineer, do not exceed 750,000 square feet of surface area of erodible earth material per equipment spread at one time. The Engineer will limit the surface area of erodible earth material exposed by clearing and grubbing, excavation, borrow and embankment operations. Limit the exposed erodible earth material according to the capability and progress and in keeping with the approved schedule.

If on-site or state-furnished off-site borrow areas are to be excavated below the ground water elevation, construct a permanent berm around the borrow area to prevent storm water runoff from entering the excavated area.

Restrict construction operations in rivers, streams and other water impoundments to those areas that must be entered for the construction of temporary or permanent structures. When no longer required, promptly remove all falsework, piling, temporary crossings and other obstructions caused by the construction.

Do not ford live streams with construction equipment.

As dictated by weather conditions, actual site conditions and construction procedures, install and maintain temporary erosion and pollution control devices as shown in the Contract Documents, and as directed by the Engineer.

Implement temporary erosion and pollution control with berms, slope drains, ditch checks, slope barriers, sediment basins, inlet sediment barriers, fertilizer, seeding, mulching and erosion control blankets.

If temporary erosion and pollution control is not implemented and maintained according to the approved schedule, all work on the project shall cease until conditions are brought into compliance, as determined by the Engineer.

d. Project Storm Water Pollution Prevention Plan (SWPPP). Include in the project SWPPP, KDOT's SWPPP, Contract Documents pertaining to temporary erosion and water pollution control, inspection and maintenance reports, and the Contractor's erosion control schedule. KDOT's SWPPP can be found on the KDOT Internet at www.ksdot.org.

Before any construction activities begin, the Contractor and subcontractors implementing any measures identified in the SWPPP are required to certify that they understand the terms and conditions of the general NPDES permit. The Engineer will provide the certification form.

Before the preconstruction conference, submit to the Field Engineer 3 copies of a schedule for implementing and maintaining erosion and pollution control work during the construction phases. No contract work may begin until the Field Engineer has approved the erosion control schedule. As a minimum, the following information shall be included in the Contractor's erosion control schedule:

- (1) The planned sequence of major construction activities.
- (2) A site map showing the locations and devices to be used for the initial perimeter controls.
- (3) A description of controls to be used:
 - Stabilization practices for all areas disturbed by construction;
 - Structural practices for all drainage/discharge locations; and
 - Other controls, including:
 - Waste disposal practices which prevent discharge of solid materials into water in the U.S.;
 - Methods of preventing contamination in areas designated for fuel and lubrication storage;
 - Actions to minimize offsite tracking of sediment by construction vehicles;
 - Actions to obtain compliance with state or local waste disposal, sanitary sewer or septic system regulations; and
 - When actions will be implemented, including permanent erosion control items when required in the Contract Documents.

(4) Acknowledgment that State and Local requirements have been included in the schedule.

(5) Provide a Maintenance and Inspection Report. See **subsection 901.3q**.

e. Temporary Berms. Use temporary berms to divert storm runoff to stabilized slopes or temporary slope drains. Construct temporary berms as shown in the Contract Documents. Compact the berms until no further consolidation is observed, using a dozer track, grader wheel or other equipment.

f. Temporary Slope Drains. Use temporary slope drains to carry storm runoff down fill slopes and cut backslopes. Construct the temporary slope drains as shown in the Contract Documents.

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g. Temporary Slope Barriers. Use any of the materials listed in the Contract Documents to construct temporary slope barriers.

When temporary biodegradable logs, straw or hay bales are used, remove and dispose of the sediment when deposits reach approximately $\frac{1}{2}$ the height of the log or bale.

When conditions warrant, supplement the temporary silt fence with a support fence. Reduce the post spacing and drive the posts further in the ground in low and soft, swampy areas. Remove and dispose of sediment deposits when the deposit approaches $\frac{1}{3}$ the height of the silt fence.

h. Temporary Ditch Checks. The option exists to use any materials listed in the Contract Documents, excluding rock, to construct temporary ditch checks. When deposits reach approximately $\frac{1}{2}$ the height of the temporary ditch check, remove and dispose of the accumulated sediment.

i. Temporary Ditch Checks Rock. Use rock to construct temporary rock ditch checks listed in the Contract Documents. When deposits reach approximately $\frac{1}{2}$ the height of the temporary rock ditch check, remove and dispose of the accumulated sediment.

j. Temporary Inlet Sediment Barrier. Use any of the materials listed in the Contract Documents to construct temporary inlet sediment barriers.

When temporary silt fence is used, reduce post spacing and drive the posts further into the ground in low and soft, swampy areas. Remove and dispose of the sediment when deposits reach approximately $\frac{1}{3}$ the height of the silt fence.

When temporary triangular silt dike, straw or hay bales are used, remove and dispose of the sediment when deposits reach approximately $\frac{1}{2}$ the height of the silt dike or bales.

k. Temporary Sediment Basins. Before constructing a temporary sediment basin, clear the area of all vegetation. Construct the temporary sediment basin with a wide cross-section and a minimum grade, as shown in the Contract Documents. Dispose of excess excavated material.

Remove and dispose of the accumulated sediment when deposits reach approximately $\frac{1}{3}$ the depth of the structure.

l. Temporary Stream Crossing. Use any of the materials shown in the Contract Documents to construct temporary stream crossings.

When the Contractor's operations require a temporary stream crossing, and one is not shown in the Contract Documents, the Contractor may install one at no cost to KDOT. Comply with all applicable rules and regulations, obtain all required permits and provide copies of all permits to the Field Engineer.

m. Temporary Fertilizer, Seed and Mulch. Prepare the seedbed, fertilize, seed and mulch according to **DIVISION 900**. Apply the temporary fertilizer, seed and mulch at the rates shown in the Contract Documents.

n. Soil Erosion Mix. Prepare a smooth, weed-free and debris-free area, and broadcast or hydro-seed the soil erosion mix seed over the prepared area. Lightly hand rake broadcasted seed before placement of the erosion control.

o. Temporary Seeding. "Temporary Seeding" is to be used only if the project has less than 1 acre of erodible surface. If this item is used, fertilize, seed and mulch all exposed erodible earth.

Prepare the seedbed, fertilize, seed and mulch according to **DIVISION 900**. Apply the temporary fertilizer, seed and mulch at the rates shown in the Contract Documents.

p. Erosion Control. After seeding according to **DIVISION 900**, install erosion control according to the manufacturer's requirements for edge and junction overlaps, staple size and staple pattern.

(1) Areas with Erosion Control (Class I). Place the Erosion Control (Class I). Do not mulch over the Erosion Control (Class I).

(2) Areas with Erosion Control (Class II). Place the Erosion Control (Class II) and cover it with $\frac{1}{2}$ inch of pulverized, fine-grained soil. Hand rake the soil into the erosion control material; then mulch the area according to **SECTION 904**.

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q. Maintenance and Removal of Temporary Erosion and Pollution Control Devices. Maintain the effectiveness of the temporary erosion and pollution control devices as long as required to contain sediment runoff. Inspect the temporary erosion and pollution control devices and complete the inspection and maintenance reports every 7 days and within 24 hours of a rainfall event of ½ inch or more. Monitor temporary erosion and pollution control devices at least daily during prolonged rainfall. Within 48 hours, begin corrective action of any deficiencies found in the perimeter controls, and complete corrective actions within 7 calendar days. Correct all other devices as soon as conditions allow access to their location without causing additional damage to the slopes.

Submit copies of inspection and maintenance reports to the Field Engineer within 3 working days after an inspection has been made. Use either KDOT-furnished maintenance report forms or approved Contractor's maintenance forms.

Remove the temporary devices when directed by the Engineer. After removing the temporary erosion and pollution control devices, remove and dispose of the silt accumulation. Grade, fertilize, seed and mulch any bare areas.

When temporary erosion and pollution control devices are installed according to the Contract Documents, or as approved by the Engineer and such devices are no longer effective because of deterioration or functional incapacity, payment will be made for replacement of these devices, as directed by the Engineer. No payment will be made for replacing temporary erosion control devices that become ineffective because of improper installation, lack of maintenance or the Contractor's failure to pursue timely installation of permanent erosion control devices according to the Contract Documents.

r. Mobilization for Emergency Erosion Control and Erosion Control Mobilization Delay Damages.

(1) Mobilize sufficient personnel, equipment, materials and incidentals to the job site within 24 hours after receiving the Engineer's written order to conduct temporary erosion control work on an emergency basis (24-hour period), unless extended by the conditions of **subsection 901.3r.(5)**. Note: "sufficient personnel, equipment, materials and incidentals" is considered to be enough to complete all emergency erosion control within the 7 days from date of notice.

(2) An emergency is a sudden occurrence of a serious nature that causes perimeter erosion control devices to fail (in whole or in part) allowing sediment to be deposited onto adjacent property or streams, or creating a risk that sediment will be deposited onto adjacent property or streams. The work is beyond normal maintenance of erosion control items and requires immediate movement of necessary personnel, equipment, materials and incidentals to the project site. The emergency may require immediate corrective work, installation of erosion control measures or both.

(3) If the Contractor mobilizes to the project within the 24-hour period or an approved extension under **subsection 901.3r.(5)**, the Engineer will pay Mobilization (Emergency Erosion Control) (Set Price).

(4) If the Contractor fails to mobilize to the project within the 24-hour period or approved extension under **subsection 901.3r.(5)**, the Contractor is liable for Erosion Control Mobilization Delay Damages. The Erosion Control Mobilization Delay Damages charged and owing are \$500.00 per calendar day for each calendar day (including Sundays, Holidays and the Winter Holiday Period) that the Contractor fails to mobilize to the project after the 24-hour period or approved extension expires. See **subsection 901.3r.(1)**.

(5) The Engineer may extend the mobilization time beyond the 24-hour period for unusually severe weather or Acts of God that prevent the Contractor from mobilizing to the project site.

s. Erosion Control Disincentive Assessment. If the Contractor fails to complete corrective actions of the perimeter controls within the 7 calendar days required under **subsection 901.3q.**, the Contractor is liable for an Erosion Control Disincentive Assessment. The Erosion Control Disincentive Assessment charged and owing is \$250.00 for each erosion control device deficiency and for each calendar day (including Sundays, Holidays and the Winter Holiday Period) the deficiency remains uncorrected.

t. Computing Mobilization Delay Damages and Erosion Control Disincentive Assessment. The Engineer will deduct and withhold the Erosion Control Mobilization Delay Damages under **subsection 901.3r.(4)** and Erosion Control Disincentive Assessment under **subsection 901.3s.** to either or both concurrently, as applicable. The assessments are to be computed in the same manner as damages under **subsection 108.8**, (Liquidated Damages) except calendar days include Sundays, Holidays and the Winter Holiday Period.

901 - TEMPORARY EROSION AND POLLUTION CONTROL

u. Indemnify KDOT, local government authorities or any other NPDES permit holders from fines that KDHE or EPA impose because of the Contractor's failure to comply with applicable laws, regulations, ordinances and permits.

901.4 MEASUREMENT AND PAYMENT

The Engineer will measure temporary berms, temporary slope drains, temporary slope barriers and temporary ditch checks by the linear foot.

The Engineer will measure temporary rock ditch checks by the cubic yard.

The Engineer will measure each temporary inlet sediment barrier and temporary stream crossing as a unit.

The Engineer will measure temporary sediment basins by the cubic yard excavated to construct the basin.

The Engineer will measure sediment removal by the cubic yard of sediment removed.

The Engineer will measure temporary fertilizer, temporary seed and soil erosion mix by the pound.

The Engineer will measure "Temporary Seeding" as a lump sum; no measurement of area is made.

The Engineer will measure erosion control by the square yard.

The Engineer will measure temporary mulching by the acre.

The Engineer will measure Mobilization, Emergency Erosion Control per each mobilization ordered by the Engineer.

The Engineer will measure any disincentive assessment on an each devise per day basis.

The Engineer will measure any erosion control mobilization delay damages by the lump sum.

Payment for the various items of temporary erosion and pollution control is full compensation for the specified work. Contract unit prices will govern regardless of overruns or underruns of the estimated quantity.

Payment for "Temporary Slope Barrier (Set Price)", "Temporary Ditch Check Rock (Set Price)", "Sediment Removal (Set Price)" and "Mobilization, Emergency Erosion Control (Set Price)" at the contract set unit prices is full compensation for the specified work.

902 - FERTILIZER, AGRICULTURAL LIMESTONE AND PEAT MOSS

SECTION 902

FERTILIZER, AGRICULTURAL LIMESTONE AND PEAT MOSS

902.1 DESCRIPTION

Provide and apply the designated materials as shown in the Contract Documents.

<u>BID ITEMS</u>	<u>UNITS</u>
Fertilizer (*-**-***)	Pound
Agricultural Limestone	Ton
Peat Moss	Ton
*Percent Nitrogen	
**Percent Phosphorous	
***Percent Potassium	

902.2 MATERIALS

Provide fertilizer, agricultural limestone and peat moss that comply with **DIVISION 2100**.

902.3 CONSTRUCTION REQUIREMENTS

a. Fertilizer. Apply the fertilizer to the prepared seedbed (**subsection 903.3b.**) at the rates designated in the Contract Documents. Use a fertilizer attachment on the seed drill to apply the fertilizer. The Contractor may apply fertilizer using an agricultural type "broadcast spreader". Spread the fertilizer uniformly by hand methods in areas where it is impracticable to use a seed drill.

b. Agricultural Limestone. Before the areas are seeded, apply the agricultural limestone at the rates designated in the Contract Documents. Use a standard lime spreader to apply the agricultural limestone. Fertilizer may be blended with agricultural limestone. When blended, apply before the areas are seeded.

c. Peat Moss. Thoroughly blend the peat moss with soil from the planting pit, or blend the peat moss with the subsoil to the depth shown in the Contract Documents. Apply peat moss at the rates shown in the Contract Documents. Before backfilling, planting, seeding or sodding, blend the peat moss by tilling, cultivating or shovel mixing.

902.4 MEASUREMENT AND PAYMENT

The Engineer will measure the fertilizer by the pound. Bag weight or commercial scale tickets are acceptable.

The Engineer will measure the agricultural limestone by the ton. Commercial scale tickets are acceptable.

The Engineer will measure peat moss by ton.

Payment for "Fertilizer", "Agricultural Limestone" and "Peat Moss" at the contract unit prices is full compensation for the specified work.

903 - SEEDING

SECTION 903

SEEDING

903.1 DESCRIPTION

Prepare the seedbed, provide the seed and plant at the rate and in the locations designated in the Contract Documents.

BID ITEMS

Seed (*)
Seed (Hydro) (*)
Seeding
* Type of Seed

UNITS

Pound
Pound
Lump Sum

903.2 MATERIALS

Provide seeds and nitrogen-fixing bacteria that comply with **DIVISION 2100**. Do not change seed or seed mixture without approval of the Environmental Scientist (Bureau of Design, Environmental Services Section).

903.3 CONSTRUCTION REQUIREMENTS

a. Seeding Seasons. Determine the seeding season using **TABLE 903-1**.

TABLE 903-1: GRASS & WILDFLOWER SEEDING SEASONS	
Type	Season
Cool Season Grasses	February 15 thru April 20 August 15 thru September 30
Warm Season Grasses and Wildflowers	November 15 thru June 1

If cool season grasses are mixed with warm season grasses, seed during the warm season seeding season. When the area to be seeded is less than 1 acre (bid item "Seeding" per lump sum), the area shall be seeded during the seeding seasons specified for either cool season grasses or warm season grasses. Plant temporary seeding any time of the year.

The Engineer may extend the seeding season a few days in special situations when only a few acres of seeding would complete the entire project.

Seed the project during the proper seeding season to protect the finished grading. This may require seeding different parts of the project at different times or seasons. Complete the area once the seeding operations begin in an area.

b. Preparation of the Seedbed. Unless shown otherwise in the Contract Documents, prepare the seedbed and seed all disturbed or cultivated areas within the right-of-way and construction easements.

The Grading Contractor shall repair eroded areas before the seedbed is prepared.

In urban areas, use a landscape box to level the seedbed. Grade seedbeds to the elevations of abutting sidewalks. Remove rocks and other debris detrimental to mowing with lawn maintenance equipment.

Before seeding, use tillage implements that shall penetrate 2 to 3 inches to prepare a firm, friable and weed-free seedbed. If the use of disks and harrows is impracticable, prepare the seedbed using hand methods.

Prepare seedbeds in developed urban and residential areas using rotary tillers or similar equipment. Tractor mounted equipment is permitted if the area is large enough to facilitate the use of such equipment.

Do not injure trees while preparing the seedbed. If the Engineer designates areas of desirable perennial native grasses to remain, do not till such areas. If areas of annual grasses such as cheat, crabgrass or triple-awn are encountered, destroy such grasses by thorough disking.

Do not till areas if temporary or existing grasses provide stable slopes with no erosion. Seed the permanent grasses into the existing cover using a no-till drill.

903 - SEEDING

c. Seeding. In rural areas, use seed drills that comply with **subsection 156.1**. If it is impracticable to operate a seed drill, broadcast the seed with a standard manufacture grass seeder. A hydro-seeder may be used in place of the broadcast seeder when approved by the Engineer.

On lawn areas and small areas in developed urban areas, apply the seed with equipment suitable for the size of the area. Use manually operated drop-seeders, cyclone spreaders or other similar equipment when appropriate. After the seeding, but before mulching, hand rake the seeded lawn areas.

Similar size seeds may be mixed before drilling. The seed company may mix the seeds before delivery, or the Contractor may mix the seeds at the project site. If the seed company mixes the seeds, each bag of mixed seeds shall have a tag indicating the quantity (pounds) of each type seed and the total weight (pounds) of the bag. If the Contractor mixes the seeds, the Engineer must witness the mixing.

If required, inoculate the seeds according **DIVISION 2100**.

The drill used for seeding shall accommodate the seed sizes and weight of seed by the use of as many compartments as required. Seeds of compatible size and weight may be mixed and placed in the same compartment. Drill seed at the rate and in the locations shown in the Contract Documents. Drills shall comply with **subsection 156.1**.

Drill the seeds into the prepared seedbed. The maximum depth for drilling grass seeds is ½ inch. Unless shown otherwise in the Contract Documents, the maximum depth for drilling wildflower seeds is ⅜ inch. If grasses and wildflowers are seeded on the same area, drill the grasses first, then the wildflowers.

After an area is fertilized and seeded, firm the soil using a cultipacker or smooth roller.

d. Hydro-seeding. On steep slopes or other areas inaccessible with a seed drill or broadcast seeder, a hydro seeder may be used when approved by the Engineer. Apply the seed-fertilizer-water slurry within 1 hour after the seed is added to the hydro-seeder tank. Apply seed evenly over the entire site. Use a fan-type nozzle with approximately 500 gallons of water per acre. Add 75 pounds of hydro-mulch per 500 gallons of water for a visual tracer. After the seeding, but before mulching, hand rake the seeded areas inaccessible by a cultipacker. Immediately apply bonded fiber matrix according to **subsection 904.3c**. Do not apply hydro-seed and bonded fiber matrix in one application.

e. Seeding/Lump Sum. This item is only used on projects with less than 1 acre of seeding.

Prepare the seedbed, fertilize, seed and mulch all disturbed or cultivated areas within the right-of-way and construction easements according to **DIVISION 900**.

903.4 MEASUREMENT AND PAYMENT

The Engineer will measure the total quantity for each type of pure live seed and soil erosion mix used by the pound.

The Engineer will measure "Seeding" by the lump sum. No measurement will be made of the area seeded.

Payment for the various types of "Seed", "Seed (Hydro)" and "Seeding" at the contract unit prices is full compensation for the specified work.

904 - MULCHING

SECTION 904

MULCHING

904.1 DESCRIPTION

Provide and place mulching materials as shown in the Contract Documents.

BID ITEMS

Mulching (Temporary)
Mulching (Permanent) (Set Price)
Mulching Tacking Slurry
Mulching (Hydro)

UNITS

Acre
Acre
Acre
Square Yard

904.2 MATERIALS

Provide materials that comply with the applicable requirements.

Mulch and Mulching Tacking Slurry	DIVISION 2100
Asphalt Materials	DIVISION 1200
Water	DIVISION 2400

904.3 CONSTRUCTION REQUIREMENTS

a. Mulching.

(1) General. Place and punch the mulch immediately after the fertilizing and seeding operations. Do not allow the mulching operations to lag behind the fertilizing and seeding operations more than 24 hours. If rain is forecast, make every effort to mulch areas the same day they are seeded.

A sufficient length of mulching material is needed for the mulch to interlap and bind together. Short stemmed mulching material is more vulnerable to wind action. When the mulching is applied with a straw blower, if required, remove the cutting knives to prevent cutting the mulch too short.

After an area is fertilized and seeded, uniformly spread the mulch over the area. Apply the mulch at the rates shown in the Contract Documents. The rates shown in the Contract Documents are a guide, the Engineer will determine if the applied mulch is sufficient to protect the seeded area.

After the mulch is applied to an area, punch the mulching material (except wood chips and excelsior material) approximately 2 inches into the ground. Perform the punching operation longitudinally, using a mulch puncher. When needed, use weights on the mulch puncher to punch the mulching material into the soil.

When the slope is too steep to use a mulch puncher, "pat" the mulch with forks as it is placed on the slope. To reduce wind loss, cover the mulch on the upper 1/3 of slope by hand spreading a light application of soil or sand on the mulch.

On lawns and small areas in urban areas, apply the mulch material using hand methods, unless otherwise approved by the Engineer. As the mulch is placed, "pat" the mulch with a fork. To reduce wind loss, hand spread a light application of soil or sand over the mulched area.

(2) Wood Cellulose Fiber Mulch. The Contractor may choose to use wood cellulose fiber mulch. When used, apply the wood cellulose fiber immediately after the seeding and cultipacking. Apply the wood cellulose fiber by means of a standard hydraulic slurry seeding machine. Demonstrate, to the Engineer's satisfaction, that the equipment and methods will result in a uniform application of the wood cellulose fiber.

Mix the wood cellulose fiber at the rate of 50 pounds per 100 gallons of water. Apply the wood cellulose fiber onto the seeded and cultipacked slope at the following rates to maximize adhesion and minimize slumping. Apply coverage at the primary angle of application at the rate of (dry) 1,170 pounds per acre. Apply the secondary angle of coverage at the rate of 630 pounds per acre of seeded slope.

Obtain complete coverage from a consistent angle of approach while applying wood cellulose fiber. Maintain secondary angles of coverage of between 175° and 185° from the primary angle.

b. Mulching Tacking Slurry. Immediately after the designated areas are fertilized, seeded and mulched, use hydraulic slurry equipment to apply the mulching tacking slurry. Unless shown otherwise in the Contract

904 - MULCHING

Documents, apply the mulching tacking slurry at the rate of 900 pounds per acre. Distribute the mulching tacking slurry uniformly over the mulch, leaving no bare spots. Arrange work so the mulching tacking slurry can be placed within 24 hours after each area has been mulched.

c. Hydro-Mulching. Apply the bonded fiber matrix over the specified areas by means of a standard hydraulic slurry seeding machine. Demonstrate, to the Engineer’s satisfaction, that the equipment and methods will result in a uniform application of the bonded fiber matrix.

Mix the bonded fiber matrix at the rate of 5 pounds per 10 gallons of water. Apply the bonded fiber matrix at the rate of (dry) 3,500 pounds per acre of seeded and cultipacked slope, immediately after the seeding and cultipacking to maximize adhesion and minimize slumping. Obtain complete coverage from a consistent angle of approach while applying bonded fiber matrix. Achieve no less than 65% coverage from the primary angle of application, and 35% coverage from the secondary angle of coverage. Maintain secondary angles of coverage of between 175° and 185° from the primary angle.

904.4 MEASUREMENT AND PAYMENT

a. Contract Quantities. The Engineer will use the contract quantities for payment, provided the project is constructed essentially to the lines and grades shown in the Contract Documents.

If the Contract Documents are altered, or if the Engineer or Contractor questions the accuracy of the contract quantities for mulch, either party may request measurement of the quantities involved.

If all parties agree, payment for mulch may also be made based on drill measurement less 5%.

b. Measured Quantities. All area measurements in this section will be based upon slope measurements.

The Engineer will measure the mulching and mulching tacking slurry by the acre. The recycled paper fibers, tacking agent and water are not measured separately, but are subsidiary to the mulching tacking slurry.

The Engineer will measure mulching (hydro) by square yard.

c. Payment. Payment for "Mulching (Temporary)", "Mulching Tacking Slurry" and "Mulching (Hydro)" at the contract unit prices is full compensation for the specified work.

When the quantity of "Mulching Tacking Slurry" overruns or underruns the contract quantity by any amount, the contract unit price shall govern.

Payment for "Mulching (Permanent) (Set Price)" at the contract set unit price (subject to the adjustments in **TABLE 904-1**) is full compensation for the specified work.

TABLE 904-1: PERMANENT MULCHING PAYMENT	
Mulching (Permanent) Quantity, M (acres)	Percent of Contract Set Unit Price Per Acre
M ≤ 15	100%
15 < M ≤ 30	90%
30 < M	80%

905 - TOPSOIL

SECTION 905

TOPSOIL

905.1 DESCRIPTION

Provide and place topsoil at the locations shown in the Contract Documents.

BID ITEM

Topsoil

UNITS

Cubic Yard

905.2 MATERIALS

Provide topsoil that complies with **DIVISION 2100**.

The Contractor-furnished site (for excavation of the topsoil) is subject to the environmental clearance provisions noted in **subsection 107.2**.

905.3 CONSTRUCTION REQUIREMENTS

Before excavating topsoil from the Contractor-furnished site, remove all grass, weeds, brush, stumps and other objectionable material from the site.

Spread the topsoil at the locations and to the depths shown in the Contract Documents. Do not harm existing plants or structures when placing and spreading the topsoil. Do not spill the topsoil on the roadway. Do not handle or spread topsoil when it is wet enough to form a 1 ½ inch soil ball without easily breaking.

Use only pulverized topsoil where 3 inches or less of topsoil is required.

After the topsoil is spread over the designated areas, remove all stones, roots, large clods (greater than 6 inches) and other objectionable material.

905.4 MEASUREMENT AND PAYMENT

a. Contract Quantities. The Engineer will use the contract quantities for payment, provided the project is constructed essentially to the lines and grades shown in the Contract Documents.

If the Contract Documents are altered, or if the Engineer or Contractor questions the accuracy of the contract quantities for topsoil, either party may request measurement of the quantities involved when excavated or after placed.

b. Measured Quantities. The Engineer will measure (by cross-sectioning) topsoil by the cubic yard. The Engineer will compute the quantities by the average end area method. Where it is impractical to measure material by the cross-section method, the Engineer may use three-dimensional measurements.

c. Payment. Payment for "Topsoil" at the contract unit price is full compensation for the specified work.

906 - SODDING

SECTION 906

SODDING

906.1 DESCRIPTION

Provide and place living sod at the locations shown in the Contract Documents.

BID ITEM

Sod (*) (**)

*Variety

**Form of Sod: roots, plugs or strips

UNITS

Square Yard

906.2 MATERIALS

Provide sod that complies with **DIVISION 2100**. Provide sod that is in vigorous growing condition.

906.3 CONSTRUCTION REQUIREMENTS

a. Sodding Seasons. Determine the sodding season using **TABLE 906-1**.

TABLE 906-1: SODDING SEASONS	
Type	Season*
Cool Season Grasses	March 1 thru April 15 September 1 thru November 15
Warm Season Grasses	May 5 thru June 30

*If the soil is workable, the Engineer may allow placement of sod between November 15 and March 1. If sod is placed during this time, the Contractor shall maintain the sod until 20 days after the beginning of the spring sodding season.

b. Construction Sequence. Sod the project during the proper sodding season to protect the finished grading. This may require sodding different parts of the project at different times or seasons. Complete the area once the sodding operations begin in an area.

c. Soil Preparation. Before preparing the soil, repair any eroded areas, and remove all weeds and surface stones greater than 1 inch in diameter. Undercut the soil below the adjacent areas so that the top of the new sod is flush with adjacent seedbeds or turfed areas, and 1 inch below sidewalks and tops of curbs.

Cultivate or pulverize the soil to a minimum depth of 1 inch. Smooth the soil, maintaining the grades established by the Grading Contractor. Place the fertilizer at the rates specified in the Contract Documents.

d. Placing the Sod. Place and fit sod strips as close together as possible. Stagger the joints between horizontal rows. Fill gaps between sod strips with sod pieces cut to the shape and size of the gaps.

Lay sod strips horizontally on slopes, starting at the bottom and working upwards, unless directed otherwise by the Engineer.

If the sod is placed on slopes of 2½:1 or steeper or in ditch bottoms, secure the sod with 6 stakes per square yard or per roll of sod. If the sod is placed on slopes steeper than 20:1 and flatter than 2½:1, secure the sod with 2 to 4 stakes per square yard or per roll of sod. Use wooden lath (approximately 6 inches long) or similar wooden materials or ungalvanized wire staples (½ inch wire diameter approximately 6 inches long) to stake the sod. Drive the stakes and staples flush with the sod surface.

After the sod is placed and secured, firm the sod using a small roller, tamper or other method approved by the Engineer.

e. Watering the Sod. Immediately after placing the sod, thoroughly water to a depth of 3 inches. Continue watering the sod every other day for 20 days after the sod is placed. The sod shall be thoroughly watered and growing when it is accepted.

906 - SODDING

906.4 MEASUREMENT AND PAYMENT

The Engineer will measure sod by the square yard.

Payment for the various types of sod at the contract unit prices is full compensation for the specified work.

907 - TREES, SHRUBS AND OTHER PLANTS

SECTION 907

TREES, SHRUBS AND OTHER PLANTS

907.1 DESCRIPTION

Provide and plant (or transplant) the designated plants as shown in the Contract Documents.

BID ITEMS

Furnishing and Planting Plant Materials
Transplanting Existing Plants

UNITS

Lump Sum
Lump Sum

907.2 MATERIALS

Provide topsoil, plants, water absorbing amendments, fertilizers, peat moss, mulches, weed control fabrics, plant bed edging and mycorrhizal fungi soil amendments that comply with **DIVISION 2100**.

907.3 CONSTRUCTION REQUIREMENTS

a. Time of Planting. Follow **TABLE 907-1**.

TABLE 907-1: PLANT PLANTING SEASONS	
Plant Type	Planting Date Range
Deciduous Plants	November 15 and April 15
Evergreen Plants	October 1 and April 15

b. Packing and Shipping Plants. Pack all plants to protect against drying, freezing, breaking or other injury.

Do not dig bare-root plants until after they have been subject to a killing frost.

Pack bare-root plants in wet packing material. If it is necessary to transport bare-root plants more than 25 miles, treat the roots with anti-transpirant gel or with acrylates before packing them for shipment.

Do not ship the plants to the project site unless the temperature at the project site is above freezing, and the soil is frost-free and in satisfactory workable condition.

Cover all plants with a tarpaulin while in transit.

Notify the Engineer at least 24 hours in advance of the delivery of the plants.

Do not plant or heel-in the plants until inspected by the Engineer.

c. Storage and Protection at the Project Site. After the Engineer has inspected and approved the plants delivered to the project, either plant immediately, or protect them by covering with canvas or heeling-in. Provide a temporary storage ground or a heel-in nursery located near the planting area.

Do not leave plants out of the ground overnight or otherwise unprotected during storage. The Engineer will reject plants damaged in any way by the lack of proper storage.

Do not cover bare-root plants with canvas for more than 10 hours. Heal-in bare-root plants that are not planted within 10 hours of delivery to the project. Treat the roots of bare-root plants with anti-transpirant gel or with acrylates as soon as the plants reach the planting site or heel-in nursery.

d. Layout. Stake the locations of all plants, and verify the planting sites with the Engineer. Notify Kansas One Call and have sites investigated for underground utilities. If overhead or underground utility lines compromise the planting sites, the Engineer will relocate the sites.

e. Preparation of the Planting Sites. Remove all rocks and undesirable material encountered from the planting site.

Do not leave excavated plant pits open overnight.

(1) Trees. Clear a 10 foot radius area at each planting site. Remove all weeds, brush and other undesirable material.

907 - TREES, SHRUBS AND OTHER PLANTS

Excavate the plant pit diameter 2 feet larger than the diameter of the root ball, and deep enough to allow the top 6 inches of the root ball to extend above the finished grade.

Mix the excavated soil with peat moss and pulverize the mixture before it is used for the backfill of the plant. Apply the peat moss at the rates in **TABLE 907-2**.

TABLE 907-2: PEAT MOSS APPLICATION FOR TREES		
Root Ball (inch)	Container #	Pounds Peat/Plant Pit
12	5	40
16	10	80
20	25	120

(2) Shrub Beds. Extend the perimeters of the shrub beds 30 inches from the center of the outside row of shrubs. Cultivate the existing soil in the shrub bed to a depth of 10 inches and remove the loose vegetation. Remove all rocks and deleterious material greater than 6 inches in any dimension.

Excavate the individual plant pits deep enough to allow the top 6 inches of the root ball to extend above the finished grade.

Mix the excavated and cultivated soil with peat moss, and pulverize the mixture. Apply the peat moss at the rates in **TABLE 907-3**.

TABLE 907-3: PEAT MOSS APPLICATION FOR SHRUBS		
Root Ball (inch)	Container #	Pounds Peat/Plant Pit
8	1	20
10	3	30
12	5	40

(3) Groundcover and Perennial Plant Beds. The perimeters of the plant beds shall extend 12 inches from the center of the outside row of plants. Cultivate the existing soil in the plant bed to a depth of 10 inches, and remove the loose vegetation. Remove all rocks, gravel and deleterious material greater than 6 inches in any dimension.

Mix the excavated and cultivated soil with peat moss, and pulverize the mixture before it is used for the backfill of the plant. Apply the peat moss at the rate of 4 pounds per square yard.

f. Planting and Mulching. Exercise care in handling all plants. Do not drop or roll plant balls. Do not lift or transport balled and burlapped (B&B) plants by the top or the trunk of the plant; lift the root ball. Replace plants damaged because of improper handling. The Engineer must approve the replacement plants.

Remove all pots and containers, regardless of the pot or container composition, from plants before planting. Do not remove wire cages before placing the plant in the planting pit. When the plant is set in the planting pit, cut and remove all twine, rope or binding material from around the stem or trunk of the plant, and from around the ball. After the plant is set in the planting pit, cut and remove the top loops and the top ring of wire cages.

Plant all plants plumb. Place trees and shrubs so that the top 6 inches of their root balls are above the finished grade. Place groundcover and perennial plants with the tops of their root balls even with or 1 inch below the finished grade.

Use the mixture of excavated material and peat moss to backfill the plants. Carefully firm the backfill material about the roots of the plant (lower 1/3 of the root ball on B&B plants). Place and firm the backfill in 3 to 4 inch layers. Firm the backfill by trampling or by the use of a tamping tool.

After trees are planted, cultivate an area 8 feet in diameter and 10 inches deep around each tree. Construct a watering basin around each tree as shown in the Contract Documents.

Place weed control fabric over the cultivated area of all shrub beds. Cut slits in the fabric to allow it to fit around the stems of each plant.

Unless shown otherwise in the Contract Documents, place composted, shredded or chipped wood mulch on the cultivated areas around all plants:

- 6 inches thick around all trees.
- 4 inches thick around all shrub beds.
- 2 inches thick around all groundcover and perennial plants.

907 - TREES, SHRUBS AND OTHER PLANTS

Place the mulching within 24 hours of the planting. Water all plants immediately after planting. Water and rake the mulched areas to provide a uniform surface. Continue to water all plants as required during the establishment period.

Install plant bed edging, when shown in the Contract Documents.

g. Pruning. Do not prune plants except to remove dead or injured branches. Do not cut central leaders. Prune broken or damaged roots. Prune with clean, sharp tools. Remove cuttings from the planting site, or cut into small pieces and place with the mulch.

Remove and replace excessively pruned and misformed stock resulting from improper pruning.

h. Staking or Guying. Unless otherwise shown in the Contract Documents, stake or guy trees according to **TABLE 907-4.**

TABLE 907-4: GUIDELINES FOR STAKING AND GUYING TREES			
Type	Size	Number	Minimum Depth of Stake in Ground (feet)
Deciduous	Less than 1 ¼ inches in caliper	1 Stake	2
Deciduous	1 ¼ to 2 inches in caliper	3 Stakes	2
Deciduous	Greater than 2 inches in caliper	3 Guys	2
Evergreens	Greater than 6 feet tall	3 Guys	2

For staking trees, use wooden stakes 2 inches by 2 inches by 8 feet. For guying trees, use wooden stakes 2 inches by 2 inches by 3 feet. Place the stakes and guys at the same time the tree is planted. Do not damage the tree roots when placing the stakes.

Use pliable steel wire (No. 12 gauge, minimum) to tie trees to the stakes. Protect the tree trunk from the wire by encasing the wire in a section of flexible, rubber hose. Do not restrict the growth of the tree when attaching the wire ties to the trunk of the tree.

Commercial tree ties may be used if approved by the Engineer.

i. Wrapping Tree Trunks. Wrap the trunks of all maple, honeylocust, crabapple and ash trees. Begin wrapping at the base of the trunk, and extend the wrap upward to a point above the lowest tree tie.

Use a tree wrap consisting of double thickness waterproof paper with an asphalt center. Begin the wrap with 2 level loops, then wind upward with ⅓ to ½ width overlaps; end the wrap with 2 level loops. Secure the wrapping with loose-twist cotton twine (6-ply, maximum). Tie the twine around the wrap at the top; then wrap the twine spirally down the tree trunk in the opposite direction to the paper wrap, tying the twine again at the bottom. Place 2 additional ties between the top and bottom. Tie the twine loose enough to accommodate a season's growth.

Stretchable or biodegradable tape or other materials may be used to secure the wrapping, when approved by the Engineer.

j. Clean-Up. After the planting operations are completed, remove all debris from the planting areas. Remove all labels from the plants. Remove all flags used for marking underground utilities.

Restore all disturbed areas to the finish grade.

k. Plant Establishment Period. The plant establishment period begins when the plants are planted (the current planting season) and ends on the following October 1.

During the plant establishment period, water, cultivate, weed, prune, spray and repair and adjust the guys and stakes, as necessary. If dead plants are discovered before the end of the current planting season, remove and replace the dead plants before the current planting season expires.

Within 10 days of the end of the plant establishment period, the Engineer will inspect all plants (planted the previous planting season). The Engineer will designate any dead or unacceptable plants. Remove and replace the designated plants before the current planting season expires.

The plant establishment period for replacement plants begins when the plants are replanted (the current planting season) and ends 30 days following the end of the current planting season.

907 - TREES, SHRUBS AND OTHER PLANTS

During the plant establishment period (for the replacement plants), water, cultivate, weed, prune, spray and repair and adjust the guys and stakes, as necessary. If dead plants are discovered before the end of the current planting season, remove and replace the dead plants before the current planting season expires.

Within 10 days of the end of the plant establishment period for replacement plants, the Engineer will evaluate the replacement plants. If the Engineer determines any replacement plants are unacceptable, the Engineer will deduct such plants from the quantities measured for pay.

Remove unacceptable replacement plants and restore the planting pits to their original condition.

The Engineer will not assess working days for maintaining and replacing plants during the establishment periods.

907.4 MEASUREMENT AND PAYMENT

The Engineer will measure furnishing and planting plant materials and transplanting existing plants by the lump sum.

The contract includes the required contract provision, Furnishing and Planting Plant Materials, which is a listing of the unit cost for the individual items, submitted by the Contractor with the proposal. The unit prices shown in the listing will be used to adjust the lump sum amount for overruns, underruns and deducting for unacceptable plants.

Payment for the "Furnishing and Planting Plant Materials" and for "Transplanting Existing Plants", at the contract unit prices is full compensation for the specified work.

908 - MOWING

SECTION 908

MOWING

908.1 DESCRIPTION

Mow the areas designated by the Engineer.

BID ITEM

Mowing

UNITS

Per Mile Per Side

908.2 MATERIALS - None specified.

908.3 CONSTRUCTION REQUIREMENTS

Use standard manufacture mowing equipment that is adequate for the work designated.

Mow only when the ground conditions prevent rutting.

If the mowing produces enough clippings and debris to retard the growth of grass, remove and dispose of the clippings and debris.

908.4 MEASUREMENT AND PAYMENT

The Engineer will measure areas mowed per mile per side for each side of the roadway mowed. The Engineer will use vehicle odometer readings (to the nearest 0.1 mile) for the measurement of quantities. The Engineer will measure the length of mowed areas along the shoulder of the side of the roadway that is mowed. Included in this measurement are all mowed areas from the shoulder to the right-of-way line. On multi-lane roadways with medians, mowing in the median is not measured for separate payment. Exceptions less than 0.1 miles, such as a bridge, are not deducted from the measurements.

Payment for "Mowing" at the contract unit price is full compensation for the specified work.

909 - SOIL COMPOST

SECTION 909

SOIL COMPOST

909.1 DESCRIPTION

Incorporate compost into the soil as designated in the Contract Documents.

909.2 MATERIALS

Provide compost suitable for general gardening, soil incorporation and plant backfill.

The Kansas Department of Health and Environment, Bureau of Waste Management, Topeka, Kansas maintains a current list of Kansas Permitted Composting Facilities. Provide compost from a Kansas Permitted Composting Facility that complies with **TABLE 909-1**.

Parameters	Range
#1 PH	6.0 - 7.5
#2 Soluble Salts	5 ds (mmhos/cm) or below
#3 Nutrient Content (dry weight basis)	N .8% or above, P 1% or above
#4 Bulk Density	28 to 35 lbs/cu ft (450 to 560 kg/m ³)
#5 Moisture Content	30 - 40%
#6 Organic Matter Content	>35% of dry weight
#7 Particle Size	pass through a ½ inch or smaller screen
#8 Stability (Maturity)	#6 or #7 (Solvita Compost Maturity Test)

Provide compost that is covered, after processing at the composting site, during transport and at the project site.

Submit the results of tests conducted on the compost and a sample of the compost (one 5 pound sealed plastic bag) to the Bureau of Design, Environmental Services Section before the compost is incorporated into the project. Conduct the tests a maximum of 4 weeks before the compost is delivered to the project.

The testing for Parameters #1 through #7 shall be conducted by Servi-Tech, Inc., Dodge City, Kansas. The Environmental Scientist will consider other testing facilities, at the Contractor's request.

The testing for Parameter #8 shall be conducted using a Solvita Compost Maturity Test kit. The Solvita Compost Maturity Test kit may be obtained from Woods End Research Laboratory, Inc.

The Environmental Scientist will visually inspect the compost sample to determine the absence of man-made materials, such as glass and plastic.

The Engineer will accept the compost based on approval of the required tests results by the KDOT Environmental Scientist and visual inspection at the project site for compliance with specified requirements.

909.3 CONSTRUCTION REQUIREMENTS

Before incorporating the compost into areas that will be seeded, sodded or planted, thoroughly rototill the areas to a depth of 6 inches.

Spread a layer (1 ¼ ± ⅛ inch thick) of compost uniformly over the rototilled soil. Use a rototiller to mix the compost and soil to a depth of 6 inches. Fine grade the mixture by raking or dragging to eliminate high spots and low spots. Lightly roll or otherwise compact the soil surface.

Mix compost with the backfill material for all plants. By volume, mix 1 part compost with 5 parts soil from the planting hole.

909.4 MEASUREMENT AND PAYMENT

The Engineer will not measure the specified work for separate payment.

910 - STONE MASONRY TREE WELLS

SECTION 910

STONE MASONRY TREE WELLS

910.1 DESCRIPTION

Construct stone masonry for tree wells at the locations designated in the Contract Documents.

BID ITEM

Stone Masonry for Tree Wells

UNITS

Cubic Yard

910.2 MATERIALS

Provide materials that comply with the applicable requirements.

Concrete and Concrete Mortar	DIVISION 400
Stone for Stone Masonry Tree Wells	DIVISION 1100
Burlap.....	DIVISION 1400

Provide granular material for tree root protection, such as sand, sand-gravel, gravel, crushed stone or chat. Provide material that is uniformly graded from coarse to fine, with all material passing a 3 inch sieve, with a gradation factor of not less than 3.00, and with a plasticity index no greater than 3. The Engineer will accept the granular material based on compliance with the specified requirements and visual inspection at the project site.

910.3 CONSTRUCTION REQUIREMENTS

Stone Masonry for Tree Wells. Do not damage the trees while placing the embankment or constructing the tree wells.

Before placing the embankment around a tree, remove all vegetation; remove no more than 2 inches of soil. Do not damage the root system. Place a uniform layer of porous granular material (6 inches in depth unless shown otherwise in the Contract Documents) above the root spread of the tree (the same area as the branch spread). Place the embankment around the tree without disturbing the layer of porous material covering the root spread of the tree.

Construct the type of stone masonry tree well (either laid in mortar or dry-laid) as shown in the Contract Documents.

Shape the stones before placing in the tree well. Dressing or hammering on the stones is not allowed after they are placed in the tree well.

Select larger stones for the bottom or foundation course of the tree well. Construct the top of the stone masonry tree well to fit the embankment slope unless shown otherwise in the Contract Documents. Firmly place the capstone layer even (flush) with adjacent stones.

(1) Stone Masonry Laid in Mortar. Clean each stone and saturate it with water before setting the stone in mortar. Settle each stone into place in a full bed of mortar. Construct the retaining wall with full-mortared joints 1 to 1 ½ inches thick. Arrange the vertical joints to break a minimum of 6 inches with those in adjoining courses. Do not locate vertical joints above or below a header.

Construct the tree well with headers to tie the masonry together. Arrange the headers to occupy at least ¼ of the surface area on the face and back of the retaining wall. Distribute the headers evenly throughout the tree well.

Use a pointing tool to finish the exposed joints. If the exposed joints are not pointed before the mortar sets, rake the exposed joints to an approximate depth of 1 ½ inches. Thoroughly wet the raked area, pack the wetted area with fresh mortar and finish the joint with a pointing tool.

After the mortar is set, clean and remove all excess mortar from the joints and surface of the stones.

Cure the finished tree well with wet burlap for a minimum of 3 days.

During cold weather, the limitations and protection requirements of **SECTION 401** will apply to the concrete footing and concrete grout.

(2) Stone Masonry Laid Dry. Construct the dry-laid tree well with broken joints, placed to form a solid, self-supporting wall. After the stones are placed, key the stones together by filling the voids with spalls or small stones. The finished tree well shall have a uniform surface.

910 - STONE MASONRY TREE WELLS

910.4 MEASUREMENT AND PAYMENT

The Engineer will measure stone masonry tree wells by the cubic yard. The measurement will be to the dimensions shown in the Contract Documents, or as revised by the Engineer.

Payment for "Stone Masonry for Tree Wells" at the contract unit price is full compensation for the specified work.

911 - PARK STRUCTURES

SECTION 911

PARK STRUCTURES

911.1 DESCRIPTION

Provide materials for and construct the specified park structures as shown in the Contract Documents.

<u>BID ITEMS</u>	<u>UNITS</u>
Bench	Each
Grill	Each
Table (*)	Each
Table Shade (**)	Each
Waste Receptacle	Each
Comfort Station (***)	Each
Comfort Station (Modification)	Each
*Wood Without Base, Wood With Concrete Base or Concrete With Concrete Base.	
**Masonry, Stone or Wood.	
***Type shown in the Contract Documents.	

911.2 MATERIALS

Provide materials that comply with the applicable requirements.

Mortar and Grade 3.5 Concrete.....	DIVISION 400
Coarse, Fine and Mixed Aggregate.....	DIVISION 1100
Concrete Masonry Units.....	DIVISION 1300
Concrete Curing Materials.....	DIVISION 1400
Cement.....	DIVISION 2000
Welded Steel Wire Fabric.....	DIVISION 1600
Lumber.....	DIVISION 2300
Water.....	DIVISION 2400

Provide other materials as shown in the Contract Documents. The Engineer will accept other materials based on compliance with dimensions and details shown in the Contract Documents.

911.3 CONSTRUCTION REQUIREMENTS

a. Earthwork. Shape and finish the park areas as shown in the Contract Documents. Eliminate all depressions that will hold surface water. If necessary, provide additional earth material.

b. Mortar and Reinforced Concrete. Use reinforcing steel according to **DIVISION 711**. Form, place, finish cure and protect the concrete according to **DIVISION 710**.

c. Park Structures. Provide and construct the park structures as shown in the Contract Documents. Apply a prime coat and 2 finish coats of paint, color and type as designated in the Contract Documents. Before painting any structure, submit color samples of the paint to the Engineer for approval. The Engineer will approve (or disapprove) the paint based on visual inspection.

911.4 MEASUREMENT AND PAYMENT

The Engineer will measure each park structure. Payment for the various park structures at the contract unit prices is full compensation for the specified work.

912 - WATER SYSTEMS

SECTION 912

WATER SYSTEMS

912.1 DESCRIPTION

Provide materials for, and construct the water system as shown in the Contract Documents.

BID ITEM

Water System

UNITS

Each

912.2 MATERIALS

Provide materials that comply with the applicable requirements.

Aggregates for Concrete and Underdrains	DIVISION 1100
Concrete Curing Materials	DIVISION 1400
Cement	DIVISION 2000
Welded Steel Wire Fabric	DIVISION 1600
Drain Tile	DIVISION 1900
Water	DIVISION 2400

912.3 CONSTRUCTION REQUIREMENTS

Construct the water system as shown in the Contract Documents. Make all service connections to the water supply unless specified otherwise in the Contract Documents.

Use Grade 3.5 concrete that complies with **SECTION 401** unless specified otherwise in the Contract Documents.

912.4 MEASUREMENT AND PAYMENT

The Engineer will measure each water system.

Payment for "Water System" at the contract unit price is full compensation for the specified work.