SECTION #02811
UNDERGROUND SPRINKLER IRRIGATION SYSTEM

PART 1 - GENERAL

1.01 WORK INCLUDED

A. Install a complete and operating underground sprinkler irrigation system.

B. The installation includes the furnishing of all labor, materials and equipment for the proper installation of the irrigation system. the work includes, but is not limited to the following;

1. All required fees and permits.
2. Trenching and backfill.
3. Automatically controlled irrigation system.
4. Test all systems and make operative.
5. As-Built drawings.

I.02 RELATED WORK

A. SECTION 02200 - EARTHWORK.

B. DIVISION I6 - Electrical Work: Power for Irrigation Controller(s).

I.03 CODES AND STANDARDS

A. All work under this Contract shall comply with all local and state codes having jurisdiction and with all requirements of the utility companies whose service may be used. All modifications required by these codes shall be made by the Contractor without additional charge to the school district. Where code requirements are less than those called for on the Plans or in these Specifications, folow the Plans and Specifications.

B.. All fees for permits, inspections, approvals, etc. of any nature whatsoever shall be paid for by the Contractor unless specifically stated otherwise. Contractor shall deliver to the Owner copies of all permits required.

I.04 QUALITY ASSURANCE

A. Installer... The installer shall be a Licensed Irrigator in the State of Texas and shall have a minimum of three years experience designing and installing irrigation systems of similar magnitude as this project. Installer shall submit a written statement attesting to the fact that Installer fulfills the above requirments. When the word "Contractor" is used in this section, it shall refer to the Installer.

B. Inspection of Site:

I. Contractor shall aacquaint himself with all site conditions. Should utilities not shown on the Contract Drawings be found during excavations, Contractor shall promptly notify the Architect/Engineer for instructions as to further action. Failure to do so with make Contractor liable for any and all damage thereto arising from his operations subsequent to discovery of such utilities not shown on Contract Drawings.

C. Coordination and Timing: Coordinate installation of irrigation system with related trades as necessary to prevent cutting, patching and unnecessary re-routing of piping.

I.05 SUBMITTALS

A. Submit written statement that Installer fulfills the requirement specified in I.04, Paragraph A, of this Section.

B. Submit shop drawings and product data under provisions of Division I.

C. Submit product data on pipe material, backflow preventors, controllers, remote control valves, automatic drain valves, valve boxes an sprinkler heads indicating size, material, manufacturer's name, catalog number and performance data.

I.06 PROJECT RECORD DOCUMENTS

A. The Contractor shall provide a neatly marked reproducible mylar plan showing triangulated locations of all valves and routing of main line pipe and wiring. These drawings shall indicate sizes and locations for all main lines, backflow preventors, branch lines, controllers, remote control valves, automatic drain valves and sprinkler heads.

B. A list of all products installed shall also be listed on the as-built drawings, indication item, size, material, manufacturer's name, catalog name and catalog number.

C. A copy of the as-built drawings shall be reduced in size, circuits color-keyed, and laminated in plastic. Drawing shall be reduced to a size that will fit inside controller box cover. Securely mount reduced, laminated drawing inside controller box cover.

I.07 GURANTEE AND MAINTENANCE INSTRUCTIONS

A. Standard one year guarantee stipulated in General Conditions shall included, but not be limited to the following:

I. Guarantee all workmanship, materials, fixtures and equipment to be free of defects.

2. Filling and repairing depressions and replacing plantings due to settlement or irrigation trenches for one year following acceptance of Project.

3. Guarantee that system will automatically drain adequately to protect from freeze damage.
4. Guarantee that system has been adjusted to supply proper coverage of ares to receive water.
5. Guarantee against all defects in material, equipment and workmanship.

B. After system is installed and approved, instruct Owner's Representative (to be designated by the Architect) in complete operation and matintenance for a period of not less than four hours during normal working hours.

C. Submit bound copy of manfacturer's operation and maintenance data for approval. Include written maintenance data on components of system and servicing requirements. Include component operation description, maintenance and inspection data, replacement part numbers and availability, and location and phone number of local service representative (within 50 mile radius).

I.08 PRODUCT STORAGE

A. During construction and storage, protect materials from damage and prolonged exposure to sunlight.

I.09 EXTRA STOCK

A. Final aceptance, provide the Owner with the following;

I. Two sprinkler heads of each size and type.
2. Two nozzles of each type.
3. Two valve keys for each type of valve box.
4. Two wrenches for removing and installing each type of head.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURES - SPRINKLER HEADS, CONTROLLERS AND CONTROL VALVES.

A. Hunter
B. Rainbird
C. Toro
D. Weathermatic

2.02 PIPE, PIPE FITTINGS AND CONNECTIONS

A. Pipe:

I. Main Pressure Lines: PVC, Class 200, SDR 21, PS 22-70.
a. 3" and larger: rubber gasket type.
b. 2-I/2" and smaller: solvent welded type.
2. Non-pressure or Lateral Lines: PVC, Class 200, SDR 21, PS 22-70. All solvent welded type.
3. Markings: All pipe and fittings shall have the following information

printed legibly in ink or molded thereon: manufacturer's name and trademark, material designation, diameter, schedule or class, and NSF logo/seal.

4. Swing Joints: King Brothers' O-ring seal type, or approved equal.

B. Fittings:

I. Solvent Weld Type: All lateral PVC pipe fittings shall be solvent weld type. Schedule 40, and of style recommended by the pipe manufacturer. No Class 200 PVC pipe is to be threaded for connection to metal pipe or metal accessories; use a threaded PVC adapter.

2. Rubber Gasket Type: Epoxy-coated steel fittings.

2.03 SPRINKLER RISERS

A. Rotary pop-up sprinkler or quick coupling valves shall have an adjustable riser assembly (three ell swing joint assembly) unless detailed othewise on Contract Drawings. These swing joint fittings shall be of schedule 40 PVC plastic and nipples schedule 80 (gray) PVC unless otherwise designated on Contract Drawings. Horizontal nipple parallel to side of lateral line shall be 8 inches long minimum. All other nipples on swing joint riser shall be of length required for proper instalation of sprinkler heads.

B. Stationary spray pop-up sprinkler heads, shrub spray heads, bubbler heads, and stationary spray sprinkler heads shall have risers made up one of the followng ways:

I. 4 inches flex-riser #FR-I00 connected directly to the lateral tee with an appropriately sized schedule 40 PVC threaded elbow and schedule 80 (gray) nipple.

2. Three schedule 40 street ells connected to lateral tee to form an adjustable riser or pop-up riser.

3. Risers for sprinkler heads my be I4 inch long minimum Toro #850-0I "Funny Pipe" with Toro #850-31 insert fittings, Rainbird swing pipe with spiral barb fittings or approved equal.

2.04 HEADS

A. Bubblers: Plastic pressure compensating type. Weathermatic No. I06 PC, Rainbird I404, or approved equal. Provide two bubblers per shrub or tree.

B. Pop-up spray heads: Rainbird Series I800-SAM-PRS (I804, I806, I8I2) with MPR plastic nozzle and filter screen or approved equal.

C. Turf rotor: Hunter Series I-25-ADS turf rotor, adjustable with check valve and stainless steel riser, with O-ring swing joint, or approved equal.

2.05 VALVES

A. Ball Valves: Ball valves shall have plastic bodies and internal assemblies designed for low-torque operation. Ball seals shall utilize Teflon and shall be self-adjusting for wear. Valves shall be Rainbird BLT valves, or approved equal.

B. Electric Section Control Valves: Heavy duty, bronze, contamination resistant. Weathermatic 8000CR or approved equal, 24 VAC electric solenoid valves

C. Quick - Coupling Valves: One inch diameter inlet and outlet, two piece , Rainbird No. 44RC with isolation valve, or approved equal. Provide one inch swivel hose-ell mounted on each coupler key. Provide one key for every two valves.

D. Automatic Drain Valves: Weathermatic No. 910, or approved equal.

2.06 CONTROLLER(S)

A. Provide automatic controller(s) with sufficient number of zones to serve areas designated on drawings to be irrigated.

B. Irri-Trol MC-Plus, pedestal-mounted. For each controller, provide SPD-587 surge protection, WCS Rainguard and Irri-Trol FC-I freeze sensor. Mount sensors in field as directed.

2.07 CONTROL WIRE AND CONNECTORS

A. Control Wire: All wire between the irrigation system controller and section control valves is to be single-strand solid copper, U.L. listed, Type UF, PVC insulated l4 guage. This wire is suitable for direct burial and conforms in all respects with the requirements for a N.E.C. Class II circuit (30 VAC or less). All wire is to be color coded so that the common wire is to have white insulation with a coordinated color strip matching the signal wire color for that controller. Signal wires are to be uniquely colored per controller.

B. Wire Connectors: All wire connectors are to have a two-piece PVC housing which, when filled with resin epoxy and pressed together, forms a permanent, one-piece, moisture-proof wire splice. All connectors are to be U.L. listed, rated 30 volt, for PVC insulated wire. No wire splices in the field will be allowed, except in valve boxes. Where splices are made in valve boxes, coil wire so that it can be lifted above grade for inspection.

2.08 VALVE BOXES

A. Provide a valve box for each of the following: l2" X l8"

l. All manual shut-off valves.
2. All sectional remote control valves.
3. All drain valves, whether manual or automatic l0"
4. All quick-coupling valves.

precedence of location over the proposed irrigation pipe. Conflicts that may occur between proposed drain pipes and irrigation pipes hsall be resolved by lowering the irrigation pipe and maintaining the drain line at its existing grade.

3.03 BACKFILLING

A. After installation of the pipe, the trenches shall be properly backfilled. Backfill around the pipe shall be rock free, and care shall be taken that no rocks or other debris rest against the pipe. The backfill shall be water puddled and tamped so as to leave no depression. Should depressions develop after completion of the work, the Contractor shall be c responsible for additional topsoil or other work to crrect these depressions. Where trenches are under paved or hadscape areas, backfill trenches in six (6) inch layers and mechanically tamp each layer.

3.04 SLEEVING

A. All pipe and wire that will be under paving or hardscape shall be placed in PVC Schedule 40 sleeves. The furnishing and installing of the sleeves shall be by the General Contractor.

3.05 PIPE LAYING

A. Polyvinyl chloride pipe sections, including both main and lateral lines, shall be installed according to manufacturer's specifications.

3.06 PIPE JOINTS

A. Solvent welded pipe shall be joined according to manufacturer's recommendations.

3.07 VALVE AND VALVE BOX PLACEMENT

A. Valves are to be installed in boxes, and shall be set with a minimum of six (6) inches of space between their top surface and the bottom of the valve box.

B. Valves shall be fully opened and fully closed to ensure that all parts are in operating condition.

C. Valve boxes shall be set plumb, vertical and concentric with the valve stem.

D. Any valve box which has moved from this position so as to prevent the use of a valve key on the operating wheel of the valve shall be reset by the Contractor at his own expense.

3.08 HEAD PLACEMENT

A. Heads shall be placed in accordance with good irrigation practice.

B. All heads shall be set one-quarter (0.25) inch above finish grade or flush to grade, not below.

C. All heads in the vicinity of pavement or hardscape shall be placed four to six (4-6) inches from the edge of the pavement or hardscape.

3.09 CONTROLLER (S)

A. Pedestal mount in mechanical room in accordance with manufacturer's instructions and details on Contract Drawings.

3.l0 HYDROSTATIC TESTS

A. General: Where any section of pressure line is provided, a hydrostatic test shall be made prior to totally backfilling the trench.

B. Pressure Test: After the main line pipe is in place, the solvent welded joints cured, the trench partially backfilled leaving joints exposed, and the concrete thrust blocks have cured, the piping or any valved section of main pressure line piping shall be subjected for two hours to a hydrostatic pressure test of l00 pounds per square inch. Each valve shall be opened and closed during the test. Exposed pipe, joints, fittings, and valves shall be carefully examined during the partially open trench test. Joints showing visible leakage shall be replace or remade as necessary. Cracked or defective piple, joints, fittings, or valves discovered as a consequence of this pressure test shall be removed and replace with sound material. The test shall be repeated until all material passes the test. All replacement and repaid shall be without additional expense to the Owner.

3.ll OPERATIONAL TESTS

A. Upon completion of the installation, the entire system shall be tested for proper operation and distribution of water. Adjustment to the radius of spray and arc of operation for all heads shall be completed by the Contractor prior to the final inspection. The Contractor shall instruct the Owner in the operation and maintenance of the system.

3.12 CLEAN UP

A. Upon completion of the work covered in this project, all debris, rock and surplus material resulting from the work shall be removed from the project site by the Contractor

END OF SECTION

SECTION 02930

LAWN - HYDRO-MULCHING

Part I - GENERAL

I.0I SUMMARY

A. Section Includeds: Soil preparation, fertilization, planting, and other requirements regarding hydro-mulching operations.

B. Related Sections:

I. Section 02200 - Earthwork: topsoil.

I.02 SUBMITTALS

A. Product Data: Submit in accordance with Section 0l340. Submit a sample label or specification for each type of fertilizer.

I.03 QUALITY ASSURANCE

A. Establishment and Acceptance: Regardless of unseasonable climatic conditions or other adverse conditions afftecting planting operations and the growth of the grass, it shall be the sole responsiblity of the Contractor to establish a uniform stand of grass. When adverse conditons such as drought, cold weather, high winds, excessive precipitation, or other factors prevail to such an extent that satisfactory results are unlikely, the Owner may, at his own discretion, stop any phase of the work until conditions change to favor the establishment of grass.

I. Uniform Stand of Grass: A uniform stand with complete coverage of the specified grass shall be defined as not less than l50 growing plants per square foot for seeded areas.

B. Post Planting Maintenance: Maintenance shall begin immediately after each portion of grass area is planted. All planted areas will be protected and maintained by watering, weeding, and replanting as necessary until receipt by Owner of Certificate of Occupancy or as much longer as necessary to establish a uniform stand with complete coverage of the specified grass. Grass shall be mowed once a week by the Contractor until final acceptance. All water equipment deemed necessary by the Contractor will be provided by the Contractor. Contractor will pay for all water required for watering.

I.04 WARRANTY

A. Grass shall be guaranteed by the Contractor for 30 days after the date of substantial completion for the project, or attainment of the required stand of grass, which ever is later. During this time, the Contractor shall be responsible for all watering, weeding, mowing, fertilization, other maintenance as required, and replanting.

I. At the end of the 30-day warranty period, the grass will be reinspected

by the Owner and the defective areas will be repaired or replaced by the Contractor

2. The grass wil be re-inspected in subsequent 30-day intervals as required until all defective areas comply with subsection 3.0l D. All costs associated with the initial 30-day warranty period and subsequent 30-day period, if required, shall be the responsiblity of the Contractor.

PART 2 - PRODUCTS

2.0l MATERIALS

A. Bermudagrass Seed: Grass seed shall be "Cynodon Dactylon" (CommonBermudagrass). The seed shall be harvested within l year prior to planting; free of Johnsongrass, field bind weed, doddler see, and free of other week seed to the limits allowable under the Federal Seed Act and applicable seed laws. The seed shall not be a mixture. The seed shall be hulled, extra fancy grade, treated with fungicide, and have a germination and purity that will produce, after allowance for Federal Seed Act tolerance, a pure live seed contnet of not less that 85%, using the formula: purity % times (germination % times plus hard or sound seed %). Seed shall be labeled in accordance with U.S. Department of Agriculture

B. Buffalograss * See attached.

C. Fertilizer: Fertilizer shall be a commercial product, uniform in composition, free flowing, and suitable for application with approved equipment. Fertilizer shall be delivered to the site in fully labeled original containers. Fertilizer which has been exposed to high hymidity and moisture, has become caked or otherwide damaged making it unsuitable for use will not be acceptable.

l. Initial Planting Application: Fertilizer for the initial planting application shall be of an organic base containing by weight the following (or other approved) percentages of nutrients: 21-0-0 (N-P-K) ammonium sulfate or the nitrogen equivalent of 33-0-0 ammonium nitrate.

D. Hydro-Mulch: Provide Conwed Hydro-Mulch. All mulch will be manufactured from hardwoods only and will be refined specifially for lawn hydro-mulch applications.

E. Roundup: Apply Roundup to all areas to receive grass to remove all undersirable plant growth.

F. Topsoil shall be as described in Section 02200.

PART 3 - EXECUTION

3.0l INSTALLATION

A. Soil Prepartion:

I. Tillage: Tillage shall be accomplished to loosen the soil, destrop existing vegetation, and prepare an acceptabel seed bed. All areas shall be tilled with heavy duty disc or chisel-type breaking plow, chisels set not more than 8" apart. Initial tillage shall be done in a crossing pattern for double coverage, then followed by a disc harrow. Depth of tillage shall be 6"

2. Cleaning: All rock and clods 3/4" in size or larger shall be removed from the fine graded area. Soil shall be further prepared by the removal of debris, including building materials, rubbish, weeds, concrete chips and small pieces of wood, regardless of size.

3. Fine Grading: After tillage and cleaning, all areas to be planted shall be leveled, fine grades, and drug with a weighted spike harrow or float drag. The required result shall be the elimination of ruts or depressions that would cause water to stand or pond immediately after rainfall or operation of the lawn irrigation system, humps, and objectionable soil clods. This shall be the final soil preparation step to be completed before the commencement of fertilizing and planting.

B. Fertilizing:

I. Initial Planting Application: The specified fertilizer shall be applied at the rate of l8 pounds per l,000 square feet (800 pounds per acre).

a. Timing: The initial planting application of fertilizer shall be applied after the soil preparation, but not more than 2 days prior to grass planting. Fertilizer shall be applied over sod after planting, but not more than 2 days later.

2. Post Planting Application: Thirty days after planting, grass areas shall receive an application of 21-0-0 or 33-0-0 fertilizer at the rate of 9 pounds per l,000 square feet (400 pounds per acre).

a. Timing: The Architect will determine if it is too late in the growing season for the post planting application. In the event that it is, the application shall be made in the spring of the next year, or the cost of the application shall become a credit due to the Owner.

3. Post Planting Maintenance: Areas without a uniform stand (complete coverage) shall receive subsequent applications of fertilizer, as described above, every 30 days until a uniform stand is achieved.

C. Planting

I. Hydroseeding: Following soild preparation, Bermudagrass seed, fertilizer, mulch, and water shall be mixed together and applied to the planting area in the following quantities and rates using conventional "Hydro-Mulch" equipment as manufactured by the Bowie Machine Works:

ITEM	RATE PER ACRE
Grass Seed - BERMUDA	II0 pounds
Fertilizer	800 pounds
Water	As needed
Wood Fiber Mulch	Minimum as needed to achieve marking of seeded areas.

BUFFALO *SEE ATTACHED

a. Timing: Under no circumstances shall grassing operations occur in planting periods other than the following: April I5 to August I5 of the year of project substantial competion. If grassing operations cannot be acomplished during these periods the Contractor shall estalish an inerim stand of winter rye grass, then reove the rye and provide specified grass during the next period in the following year.

D. Acceptance of grass for the purpose of establishing the date of Substantial Completion and subsequent re-inspections shall be base on the following minimum requirements.

I. Grass must indicate weed-free uniform, healthy, and vigorous growth, devoid of discoloration and signs of dehydration.

2. The grade shall be free of low or hollow places so that water shall not stand or pond during rains or irrigation operation.

3. Grass shall be firmly rooted so that sections cannot be removed.

E. Protection: No heavy equipment shall be moved over the planted lawn area unless the soil is again prepared, graded, leveled, and replanted. Protect all paving surfaces, curbs, utilities, plant materials and any other existing improvements from damage by heavy equipment. Any damages shall be repaired or replaced at no cost to the Owner.

F. Erosion Control: Throughout the project and the maintenance period for grass, it is the Contractor's responsiblity to maintain the topsoil in place at specified grades. Topsoil and grass losses due to erosion shall be replaced by the Contractor until establishment and acceptance is achieved.

G. Clean Up: Contractor shall remove excess material or debris brought onto the site or unearthed as a result of hydro-mulching operations

*A. Buffalograss Seed: Turfgrass seed shall be "Buchloe dactyloides" (Buffalograss). The seed shall be harvested within one (I) year prior to planting, free of Johnsongrass, field bind weed, dodder seed, and free of other weed seed to the limits allowable under the Federal Seed Act and applicable seed laws. The seed shall not be a mixture. The seed shall be treated with fungicide. Seed shall be labeled in accordance with U.S.

Department of Agruiculture rules and regulations.

I. Certificate Submittal: Prior to planting, provide the Owner or his representative with the State Certificate stating analysis of purity and germination of seed.

END OF SECTION

SECTION 02950

GROUNDCOVER PLANTING

PART I - GENERAL

I.0I SUMMARY

A. Section Includes: Planting groundcover.

B. Retlated Sections:

I. Section 02200 - Earthwork: topsoil.

I.03 REFERENCES

A. Standards:

I. American Standard for Nursery Stock, Current Edition as published by the American Assoication of Nurseymen.

2. American Joint Committee on Horticulture Nomenclature, I942 Editon of Standardized Plant Names.

I.04 WARRANTY

A. All groundcover shall be guaranteed for six months, which begins upon acceptance of work by the Architect. At the end of the guarantee period, inspection will be made by the Owner. Any plant material required under this contract that is dead or not in satisfactory growth conditon shall be removed and replaced with the same size and kind of plant specified, at not cost to the Owner.

PART 2 - PRODUCTS

2.0I GROUNDCOVER PLANTS

A. Plant Names and Locations: As noted on the drawings.

B. Quality and Sizes: All plant materials shall be first class representatives of their nornal species or variety, having a habit of growth nornal for the species, and shall be healthy, shapely, well-rooted, and vigorous. All plant material shall be free from insect pests, plant diseases, and injuries. The containers and balls of plants shall be feee from any weeds or grasses which could be considered noxious or objectionale, specifically nutgrass or Johnsongrass. All plant materials shall be equal to or exceed the measurements specified on the drawings.

C. Packaging Container grown plants, designated as "gal. can" on the drawings, shall be full or heavy grade and shall have been growing in the specified size container for one full season prior to delivery to the site.

2.02 PLANTING MATERIALS

A. Topsoil: All planting bed topsoild shall be "Acid Gro Complete Mix" produced by Soil Building Systems, Inc., Dallas, TX.

B. Mulch shall consist of horticultural grade, nugget pine, redwood, fir or cypress bark (decor bark) free of sticks, stones, clay, or other foreign materials. The bark must be in nuggets of 3/4" to I", graded size, and

must be of such character as not to be easily displace by wind.

C. Root activator shall be Green Light or Ortho brand.

D. Soil sterilant shall be "Vapam" , manufactured by Green Light Co.

E. Weed controller shall be "Round-up" as manufactured by Monsanto, Inc.

F. Water: Clean and potable.

PART 3 - EXECUTION

3.0l GROUNDCOVER PLANTING

A. Layout: All planting locations shall be staked and approved by the Architect prior to digging the planting beds.

B. Bed Preparation:

l. All planting beds shall be excavated to 5" below finished grade and all debris, stone, rubbish, weeds, and topsoild shall be removed.

2. The subgrade shall then be tilled to a dept of 3".

3. The planting bed shall be backfilled with topsoil --"Acid Gro Complete Mix."

4. After planting the beds shall be l" above finished grade to allow for settling.

C. Setting the Plants:

l. Plant in pits, centered, and set to touch such depth that the finished grade level at the plant after setttlement will be the same as that at which the plant was grown.

2. Plant upright and faced to give the best appearance or relationship to adjacent plants or structures.

3. Cut off broken or frayed roots.

4. Place an compact carefully prepared soil to avoid injury to roots and to fill all voids.

5. When the hole is nearly finished, add water and root activator and allow it to soak away.

6. Fill the hole to finished grade.

D. Mulching: Mulch the entire area between the plants, regardless of plant spacing, with a 2" deep layer of mulch material.

3.02 CLEAN UP

A. All excess soil, soil prepartion materials, fertilizer, or plant containers shall be revoved from the site upon completion of the work.

3.03 MAINTENANCE

A. Contractor shall be responsible for watering, cultivating, and other necessary maintenance until the completion and acceptane of all work.

B. Upon acceptance of the groundcover planting, deliver to the Owner a brief, written maintenance guide describing recommended planting

maintenance procedure, methods, products, quantities, and timing.

END OF SECTION

1.00 GENERAL

1.01 RELATED DOCUMENTS

A. The general provisions of the Contract, including General Conditions, Supplementary Conditions and Special Conditions, if any, apply to the work specified in this section.

1.02 SCOPE OF WORK

A. The work under this section of the specifications entitled consists of furnishing all materials, supervision, labor, equipment, appliances and services necessary for and incidental to completing all operations in connection with these specifications and the applicable drawings, and subject to the terms of the Contract. In general the work shall include, but is not to be limited to, the following within the Contract limit line.

2.00 MATERIALS

2.01 STEEL EDGING

A. Steel edging shall be green colored steel, 1/8" x 4" with 12" steel spikes.

3.00 INSTALLATION

3.01 LAYOUT

A. Stake or mark edging location for the Architect's approval prior to start of installation.

3.02 SETTING

A. Dig trench and place edging perpendicular to finish grade and one inch above finish grade. Drive stakes in each location provided by the manufacturer and on each side of any end cut wherever a manufacturer's slit is not located.

3.03 FINISHING

A. Backfill with the appropriate soil mix on each side of the edging. Tamp soil on both sides at the same time so as not to cause "wiggles" in the edging. Steel edging with wiggles in the line will be removed and replaced with new edging ,if too severe to be corrected by redoing.

SECTION 02920 - TOPSOILING

- GENERAL

SUMMARY (Not Applicable)

REFERENCES (Not Applicable)

SUBMITTALS

The following shall be submitted in accordance with SECTION 01300 - SUBMITTALS:

SD-43, Construction Equipment List

The Contractor shall furnish a list and description of the equipment that is proposed for handling and placing all topsoil.

SD-76, Certificate of Compliance

The Contractor shall furnish a certificate of compliance and analysis certifying that the topsoil proposed for use at the project site conforms to the specified requirements.

INSPECTION

Not less than 5 days prior to the commencement of topsoiling operations, the Contracting Officer shall be notified of the offsite sources from which topsoil is to be furnished. The material will be inspected to determine whether the selected topsoil meets the requirements. The topsoil shall be approved prior to use.

METHOD OF MEASUREMENT

The unit of measurement for topsoiling shall be the cubic yard. The yardage to be paid for shall be the number of cubic yards of topsoil excavated from the designated source. The volume will be computed between the actual lines and grades to which topsoil excavation has been made and the original ground surface as determined by the initial survey.

PAYMENT

Topsoil will be paid for at the contract price per cubic yard for topsoil furnished and placed as specified, which payment shall constitute full compensation for all work covered by this section of the specifications.

PART 2 - PRODUCTS

2.1 TOPSOIL

All topsoil necessary to complete the work shall be obtained from topsoil stockpiles from grading and excavating operations and from approved topsoil sources off of Government controlled property. Topsoil from approved sources and stockpiled topsoil shall be natural, friable, topsoil characteristic of representative soils in the vicinity that produce heavy growths of crops, grass, or other vegetation. Topsoil shall be free from tree roots, stones, shale, parent and other materials that hinder grading, planting, plant growth and maintenance operations, and free from noxious and other objectionable weed seeds and toxic substances.

PART 3 - EXECUTION

3.1 GENERAL

Graded areas shall be topsoiled where it is determined by the Contracting Officer that at least 6 inches of suitable soil for the growth of grass is not present. Equipment necessary for handling and placing all materials required shall be on hand, in good condition and shall be approved before the work is started. Grades on the areas to be topsoiled are shown on the drawings and shall be maintained in a true and even condition. 12 inches of gravel material shall be removed from existing berms and replaced with 12 inches of suitable topsoil.

3.2 TILLAGE

Immediately prior to dumping and spreading the topsoil, the subgrade shall be double tilled to a depth of 2 inches using a chisel plow with the 1 chisels set not more than 10 inches apart. Tillage shall be accomplished across the slope.

3.3 OBTAINING TOPSOIL

After inspection and approval of the source of topsoil, and prior to stripping, rank growths of vegetation, stones, or debris on the surface that might interfere with grading or later tillage operations shall be removed. Sod or other cover that cannot be disked or otherwise incorporated into the topsoil so that the topsoil can be spread properly shall be removed. Topsoil shall be removed to the depth specified by the Contracting Officer.

3.4 PLACING TOPSOIL

Topsoil shall be uniformly distributed and evenly spread to an average thickness of 6 inches, with a minimum thickness of 5 inches. Topsoil shall be spread so that planting can proceed with little additional soil preparation or tillage. Surface irregularities resulting from topsoiling or other operations shall be leveled to prevent depressions. The grades shall be

adjusted to assure that the planted grade shall be 1 inch below the adjoining grade of any surfaced area. Topsoil shall not be placed when the subgrade is frozen, excessively wet or compacted, extremely dry, or in a condition detrimental to the proposed planting or grading.

CLEANUP

Prior to topsoiling, vegetation that may interfere with operations shall be mowed, grubbed, and raked. The collected material shall be removed from the site. The surface shall be cleaned of stumps, and stones larger than 1 inch in diameter, and roots, cable, wire and other materials that might hinder the work or subsequent maintenance shall also be removed.

REPAIR

Where any portion of the surfaces becomes gullied or otherwise damaged, the affected area shall be repaired to establish the condition and grade prior to topsoiling, and then shall be re-topsoiled as specified in paragraph covering PLACING TOPSOIL.

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PART 1 - GENERAL

1.1 RELATED DOCUMENTS

Drawings and General Provisions of Contract, including General and Supplementary Conditions and other Division 1 Specification sections, apply to work of this Section.

1.2 DESCRIPTION OF WORK

A. Extent of landscape development work is shown on Drawings and in schedules.

B. Subgrade Elevations: Excavation, filling and grading required to establish elevations shown on Drawings are not specified in this section.

1.3 QUALITY ASSURANCE

A. Subcontract landscape work to a single firm specializing in landscape work.

B. Source Quality Control

1. General: Ship landscape materials with certificates of inspection required by governing authorities. Comply with regulations applicable to landscape materials.

2. Do not make substitutions. If specified landscape material is not obtainable, submit to Architect proof of non-availability and proposal for use of equivalent material. When authorized, adjustment of contract amount will be made.

3. Analysis and Standards: Package standard products with manufacturer's certified analysis. For other materials, provide analysis by recognized laboratory made in accordance with methods established by the Association of Official Agriculture Chemists, wherever applicable.

C. Topsoil: Before delivery of imported topsoil, furnish Architect with written statement giving location of properties from which topsoil is to be obtained, names and addresses of owners, depth to be stripped, and crops grown during past 2 years.

D. Trees

1. Provide trees grown in a recognized nursery in accordance with good horticultural practice. Provide healthy, vigorous stock free of disease, insects, eggs, larvae, and defects such as knots, sun-scald, injuries, abrasions, or disfigurement.

2. Sizes: Provide trees of sizes shown or specified. Trees of larger size may be used if acceptable to Architect, and if sizes of roots or balls are increased proportionately.

3. Inspection: Architect reserves right to inspect trees either at place of growth or at site before planting, for compliance with requirements for name, variety, size and quality.

1.4 SUBMITTALS

A. Certification: Submit certificates of inspection as required by governmental authorities, and manufacturer's or vendors certified analysis for soil amendments and fertilizer materials. Submit other data substantiating that materials comply with specified requirements.

B. Planting Schedule: Submit planting schedule showing scheduled dates for each type of planting in each area of site.

C. Maintenance Instructions: Submit typewritten instructions recommending procedures to be established by Owner for maintenance of landscape work for one full year. Submit prior to expiration of required maintenance period(s).

1.5 DELIVERY, STORAGE AND HANDLING

A. Packaged Materials: Deliver packaged materials in containers showing weight, analysis and name of manufacturer. Protect materials from deterioration during delivery, and while stored at site.

B. Trees: Provide freshly dug trees. Do not prune prior to delivery. Do not bend or bind-tie trees in such manner as to damage bark, break branches or destroy natural shape. Provide protective covering during delivery.

C. Deliver trees after preparations for planting have been completed and plant immediately. If planting is delayed more than 6 hours after delivery, set trees in shade, protect from weather and mechanical damage, and keep roots moist.

D. Do not remove container grown stock from containers until planting time.

E. Label at least one tree of each variety with a securely attached waterproof tag bearing legible designation of botanical and common name.

1.6 JOB CONDITIONS

A. Proceed with and complete landscape work as rapidly as portions of site become available, working within seasonal limitations for each kind of landscape work required.

B. Utilities: Determine location of underground utilities and perform work in a manner which will avoid possible damage. Hand excavate, as required. Maintain grade stakes set by others until removal is mutually agreed upon by parties concerned.

C. Excavation: When conditions detrimental to plant growth are encountered, such as rubble fill, adverse drainage conditions, or obstructions, notify Architect before planting.

D. Planting Time: Plant or install materials during normal planting seasons for each type of landscape work required. Correlate planting with specified maintenance periods to provide maintenance from date of substantial completion.

1.7 SPECIAL PROJECT WARRANTY

A. Warranty lawns through specified maintenance period.

B. Warranty trees for a period of one year following substantial completion.

C. Remove and replace trees or other plants found to be dead or in unhealthy condition during warranty period. Make replacements during growth season following end of warranty period. Replace trees which are in doubtful condition at end of warranty period; unless, in opinion of Architect, it is advisable to extend warranty period for a full growing season.

PART 2 - PRODUCTS

2.1 TOPSOIL

A. Existing topsoil will be stockpiled for reuse in landscape work as described below.

1. Use new imported topsoil on lawn areas scheduled for hydromulching.

2. Use stockpiled existing topsoil where required on areas scheduled for seeding. Supplement the existing topsoil with new imported topsoil if necessary to meet the requirements of the specifications.

3. The topsoil allowance will be used to purchase topsoil to be used on the seeded area only.

B. Provide new imported topsoil which is fertile, friable, natural loam, surface soil, reasonably free of subsoil, clay lumps, brush, weeds and other litter, and free of roots, stumps, stones larger than 2" in any dimension, and other extraneous or toxic matter harmful to plant growth.

C. Obtain topsoil from local sources or from areas having similar soil characteristics to that found at project site. Obtain topsoil only from naturally, well-drained sites where topsoil occurs in a depth of not less than 4"; do not obtain from bogs or marshes.

D. Provide a minimum of 4" of topsoil over all areas scheduled to receive hydromulch or seeding.

E. Run soil tests prior to topsoil sample approval and at the Architect's discretion throughout topsoil installation. Testing expenses will be borne by the Contractor. Topsoil that does not meet the following requirements will not be accepted.

1. Natural Organic Content: By dry oven weight, as measured by "wet digestion process" to be not less than 1.5%.

2. P.H. of Topsoil: No more than 7.6.

3. Sand Content: No more than 50% oven dry weight.

2.2 SOIL AMENDMENTS

A. Peat Humus: FS Q-P-166 and with texture and ph range suitable for intended use.

B. Commercial Fertilizer: Complete fertilizer of neutral character, with some elements derived from organic sources and containing following percentages of available plant nutrients:

1. For trees, provide fertilizer with not less than 10% available phosphoric acid and from 3% to 5% total nitrogen and from 3% to 5% soluble potash.

2. For lawns, provide fertilizer with not less than 4% phosphoric acid and not less than 2% potassium, and percentage of nitrogen required to provide not less than 1 lb. of actual nitrogen per 1000 sq. ft. of lawn area. Provide nitrogen in a form that will be available to lawn during initial period of growth.

2.3 PLANT MATERIALS

A. Quality: Provide trees complying with recommendations and requirements of ANSI Z 60.1 "Standard for Nursery Stock" and as specified.

B. Trees (applies only if Alternate No. 6 is accepted)

1. Provide trees of height and size listed or shown and with branching configuration recommended by ANSI Z 60.1 for type and species required. Provide single stem trees except where special forms are shown or listed.

2. Provide balled and burlapped (B&B) trees.

2.4 GRASS MATERIALS

A. Hydromulch: Hydromulching of areas indicated on the drawings to be included in the Base Bid.

1. Mulch: Wood cellulose fiber, 40 to 50 lbs. per 1000 sq. ft.

2. Fertilizer: Triple 13, 17 lbs. per 1000 sq. ft.

3. Hulled Bermuda Seed: 1-1/2 lbs. per 1000 sq. ft.

4. Soil Binder: In proportions as required to alleviate erosion and/or sloping conditions.

B. Seeded Areas: Areas indicated on the Drawings to be seeded to receive seed in the following amounts:

1. Hulled Bermuda Grass Seed: 2 lbs. per 1000 sq. ft.

2.5 PREPARATION OF PLANTING SOIL

A. Before mixing, clean topsoil of roots, plants, sods, stones, clay lumps, and other extraneous materials harmful or toxic to plant growth.

B. Mix specified soil amendments and fertilizers with topsoil at rates specified. Delay mixing of fertilizer if planting will not follow placing of planting soil within a few days.

PART 3 - EXECUTION

3.1 PREPARATION

A. Preparation for Planting Lawns

1. Loosen subgrade of lawn areas to a minimum depth of 4". Remove stones over 1-1/2" in any dimension and sticks, roots, rubbish and other extraneous matter. Limit preparation to areas which will be planted promptly after preparation.

2. Spread planting soil mixture to minimum depth of 4" to meet lines, grades and elevations shown, after light rolling and natural settlement.

3. Place approximately 1/2 of total amount of planting soil required. Work into top of loosened subgrade to create a transition layer and then place remainder of planting soil.

4. Grade lawn areas to smooth, even surface with loose, uniformly fine texture. Roll and rake and remove ridges and fill depressions, as required to meet finish grades. Limit fine grading to areas which can be planted immediately after grading.

5. Moisten prepared lawn areas before planting if soil is dry. Water thoroughly and allow surface moisture to dry before planting lawns. Do not create a muddy soil condition.

6. Restore lawn areas to specified condition if eroded or otherwise disturbed after fine grading and prior to planting.

7. Remove all weeds and grass and till lightly immediately before planting.

3.2 PLANTING

A. Planting Trees

1. Set balled and burlapped (B&B) stock on layer of compacted planting soil mixture, plumb and in center of pit or trench with top of ball at same elevation as adjacent finished landscape grades. Remove burlap from sides of balls; retain on bottoms. When set, place additional backfill around base and sides of ball, and work each layer to settle backfill and eliminate voids and air pockets. When excavation is approximately 2/3 full, water thoroughly before placing remainder of backfill. Repeat watering until no more is absorbed. Water again after placing final layer of backfill.

2. Set container grown stock as specified for balled and burlapped stock, except cut cans on 2 sides with an approved can cutter; remove bottoms of wooden boxes after partial backfilling so as not to damage root balls.

3. Dish top of backfill to allow for mulching.

4. Mulch pits, trenches and planted areas. Provide not less than 2" thickness of mulch and work into top of backfill and finish level with adjacent finish grades.

5. Apply anti-dessicant using power spray to provide an adequate film over trunks, branches, stems, twigs and foliage.

6. If trees are moved in full-leaf, spray with anti-dessicant at nursery before moving and again in 2 weeks after planting.

7. Prune, thin out and shape trees in accordance with standard horticultural practice. Prune trees to retain required height and spread. Unless otherwise directed by Architect, do not cut tree leaders, and remove only injured or dead branches from flowering trees, if any.

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

9. Wrap tree trunks of 2" caliper and larger. Start at ground and cover trunk to height of first branches and securely attach. Inspect tree trunk for injury, improper pruning and insect infestation and take corrective measures before wrapping.

10. Guy and stake trees immediately after planting, as indicated.

B. Seeding New Lawns

1. Hydromulch

a. Apply hydromulch, taking extreme caution not to spray material outside the lawn areas by using a 4' x 8' batter board.

b. Regrade and replant as necessary to provide an acceptable lawn.

c. An acceptable lawn must be established before substantial completion of the project.

d. An acceptable lawn is defined as a stand of grass which covers a minimum of 90% of the area scheduled to receive hydromulch and that is in a condition of growth that is acceptable to the Owner.

2. Seeded Areas: Plant seed evenly over entire area scheduled for seeding to a depth of 1/4" to 1/2".

a. Seeded areas must exhibit uniform germination and be in a condition of growth before substantial completion.

3.3 MAINTENANCE

A. Trees

1. Begin maintenance immediately after planting.

2. Maintain trees until final acceptance but in no case less than following period:

   a. 30 days after substantial completion of planting.

3. Maintain trees by pruning, cultivating and weeding as required for healthy growth. Restore planting saucers. Tighten and repair stake and guy supports and reset trees and shrubs to proper grades or vertical position as required. Restore or replace damaged wrappings. Spray as required to keep trees free of insects and disease.

B. Maintain lawns for not less than the period stated below and longer as required to establish an acceptable lawn.

1. Hydromulched lawns - until substantial completion.

2. Seeded lawns - until substantial completion.

C. Maintain lawns by watering, fertilizing, weeding, mowing, trimming, and other operations such as rolling, regrading and replanting as required to establish a smooth, acceptable lawn, free of eroded or bare areas.

3.4 CLEANUP AND PROTECTION

A. During landscape work, keep pavements clean and work area in an orderly condition.

B. Protect landscape work and materials from damage due to landscape operations, operations by other contractors and trades and trespassers. Maintain protection during installation and maintenance periods. Treat, repair or replace damaged landscape work as directed.

3.5 INSPECTION AND ACCEPTANCE

A. When landscape work is completed, including maintenance, Architect will, upon request, make an inspection to determine acceptability.

B. Where inspected landscape work does not comply with requirements, replace rejected work and continue specified maintenance until reinspected by Architect and found to be acceptable. Remove rejected plants and materials promptly from project site.

END OF SECTION.

SECTION 02935

LAWNS - SODDING

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes: Grass sodding.

B. Related Sections:
1. Section 02200 - Earthwork: topsoil.

1.02 DEFINITION OF TERMS

A. Grass area shall mean all areas to be grassed with sod.

B. Materials shall mean all items such as topsoil, fertilizer, herbicide, and grass needed to accomplish the grassing.

1.03 QUALITY ASSURANCE

A. Inspection of Grass Sod and Materials: Grass sod is subject to inspection and approval at the place of growth or upon delivery, for conformity to specification requirements as to quality and variety. Such approval shall not impair the right of inspection upon delivery at the site during the progress of work or right to rejection due to damage suffered in handling or transportation. Rejected grass shall be removed immediately from the site. Materials are subject to inspection and approval upon delivery.

1.04 WARRANTY

A. Grass shall be guaranteed by the Contractor for 30 days after the date of substantial completion for the project, or attainment of the required stand of grass, which ever is later. During this time, the Contractor shall be responsible for all watering, weeding, mowing, fertilization, other maintenance as required, and replanting.
1. At the end of the 30-day warranty period, the grass will be re-inspected by the Owner and any defective areas will be repaired or replaced by the Contractor.
2. The grass will be re-inspected in subsequent 30-day intervals as required until all defective areas comply with subsection 3.01, E. All costs associated with the initial 30-day warranty period and subsequent 30-day periods, if required, shall be the responsibility of the Contractor.

3.02 GRASS REPLACEMENTS

A. All replacements shall be grass of the same type as specified on the drawings. Replacement grass shall be furnished and planted as specified under paragraph: Installation of Sod. The cost shall be borne by the Contractor except for those replacements resulting from civil disobedience, acts of neglect on the part of others, physical damage by animals, improper Owner maintenance, vehicles, fire, or losses due to curtailment of water by local authorities or to "Acts of God". Floods, tornadoes, winds of hurricane force, hail, exceptional or untimely freezes are not normal and the damage they do cannot be calculated in a bid.

3.03 MAINTENANCE

A. During Grass Operations:
   1. Maintenance shall begin immediately after grassing is started and shall continue until the work is substantially completed and accepted. Grass shall be watered, maintained and protected until accepted by the Architect in writing.
   2. Settled grass shall be reset to proper grade position and dead grass removed. Defective work shall be corrected as soon as possible after it becomes apparent and weather and season permit. Upon completion of grassing and prior to substantial completion, the Contractor shall remove from the site excess soil and debris, and repair any damage to structures, resulting from grassing operations.
   3. All lawn areas shall be mowed as required to maintain a maximum height of 2" until accepted by the Architect.

B. Maintenance Program: Contractor shall supply the Owner's representative with a year's written recommended maintenance program. Owner's representative must approve the maintenance program before final payment is made to the Contractor.

3.04 SITE MAINTENANCE

A. The Contractor shall at all times maintain the site in a neat and orderly condition, free from trash and waste construction materials. Unattended construction materials, equipment and trash shall be left in such a manner that they do not constitute fire hazards or become or cause nuisance or dangers due to forces of nature such as rain and wind. Existing improvements, as designated by the Owner's representative, whether on the construction site or adjacent property, shall be protected in place and shall be provided with adequate access. Paved areas shall be cleaned of all mud and debris resulting from grassing operations.

3.05 FINAL CLEANUP

A. After completion of the work required under the contract and before acceptance of the work, the Contractor shall at his own expense cleanup the site of the work and any and all property used during grassing operations to the satisfaction of the Owner's representative.

SECTION 02955

TREES

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes: Tree planting.

B. Related Sections:
1. Section 02200 - Earthwork: topsoil.

1.02 REFERENCES

A. Standards:
1. American Standard for Nursery Stock, Current Edition as published by the American Association of Nurserymen.
2. American Joint Committee on Horticulture Nomenclature, 1942 Edition of Standardized Plant Names.

PART 2 - PRODUCTS

2.01 TREES

A. Trees will be subject to inspection for quality, size and color. Trees shall be dug and handled with reasonable care and skill to prevent injuries to the trunk, branches, and roots. Trees which are not of proper proportions, or trees which are weak or thin will not be acceptable. Trees which have been cut back from larger grades to meet certain specified requirements will be rejected.

B. Trees shall have normal, well-developed branches and a vigorous root system, and shall be healthy, vigorous trees free from defects, decay, disfiguring growth habits, sun-scald injuries, abrasions of the bark, plant diseases, insect nests and eggs, borers and all forms of infestations or objectionable disfigurements.

2.02 TREE PIT BACKFILL MATERIALS

A. Topsoil for backfill mix shall be as described in Section 02200 - Earthwork.

B. Sharp sand shall be clean, washed sand, fine to coarse in size.

C. Peat Moss: Commercial, imported sphagnum moss, meeting the following standards:
1. 90% purity.
2. 500% water absorption on dry weight.
3. 3/4" maximum granular size of particles.
4. 80 cu. ft. per ton.
5. 4.0 to 7.5 acidity (pH factor).

D. Prepared Planting Soil: Mix the materials and use as backfill for all plantings. The mixture shall be in the following proportions:
   1 part sandy loam topsoil
   1 part peat
   1 part sharp sand

E. Fertilizer shall be organic base, uniform in composition, dry and free-flowing. Fertilizer shall contain 12% nitrogen, 12% phosphoric acid, and 6% potash.

F. Mulch shall consist of horticultural grade, nugget pine, redwood, fir or cypress bark (decor bark), free of sticks, stones, clay, or other foreign materials. The bark must be in nuggets of 3/4" to 1", graded size, and must be of such character as not to be easily displaced by wing.

G. Root activator shall be Green Light or Ortho brand.

H. Water: Clean and potable.

2.03 MISCELLANEOUS MATERIALS

A. Wrapping materials used in wrapping tree trunks shall be Kraft type tree wrapping material.

PART 3 - EXECUTION

3.01 TREE PLANTING

A. Excavate tree pits to a depth of 6" greater than the depth of the ball and 2 feet greater than the diameter of the ball, except where restricted by concrete walks.

B. Excavated material from the tree pits shall be removed from the limits of the project.

C. All trees shall be planted using pre-mixed backfill material in pits, centered, and set to such a depth that the finished grade level at the plant after settlement will be the same as that at which the plant was frown. Each tree shall be planted upright and faced to give the best appearance or relationship to adjacent trees or structures. No burlap shall be pulled out from under balls or broken when taken from containers. All broken or frayed roots shall be cut off cleanly. Prepared soil shall be placed and compacted carefully to avoid injury to roots and to fill all voids. When the hole is nearly filled, add water and root activator, mixed per manufacturer's recommendations, and allow it to soak away. Fill the hole to finish grade.

D. Provide a 4" high watering ring and 2" depth of pine bark mulch and thoroughly water to insure saturation of the root system.

E. Pruning: Each tree shall be pruned in accordance with American Association of Nurserymen. Each tree will be pruned to preserve natural shape and character of plant. All pruning will be done after delivery

to site. All soft wood or sucker growth and all broken or badly bruised branches shall be removed. All pruning cuts shall be sharp and clean. Pruning cuts over 3/4" in diameter will be painted with tree surgery paint, applied on all cambium and other living tissues immediately after cuts are made.

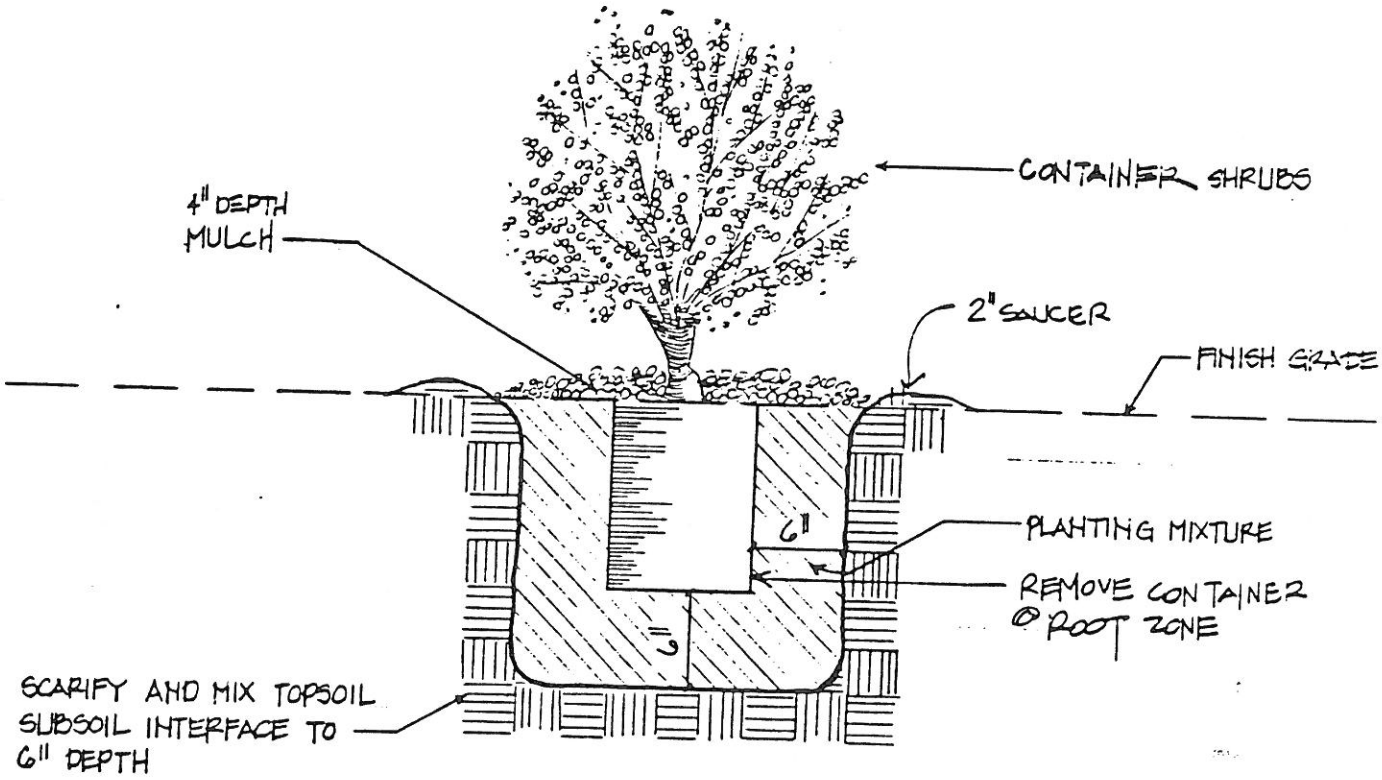
F. Fertilizer: The Contractor shall fertilize, at the time of planting, each tree at the rate of 3 pounds per inch of tree trunk caliper.

G. Tree Wrapping: Wrap all trees. Extend wrapping from the lowest branch on the trunk and work down to the ground. Spirally wrap from top down when trees are being planted. Securely fasten wrapping material in place, to itself, with tacks or staples so that wrapping will remain in place for 2 years.

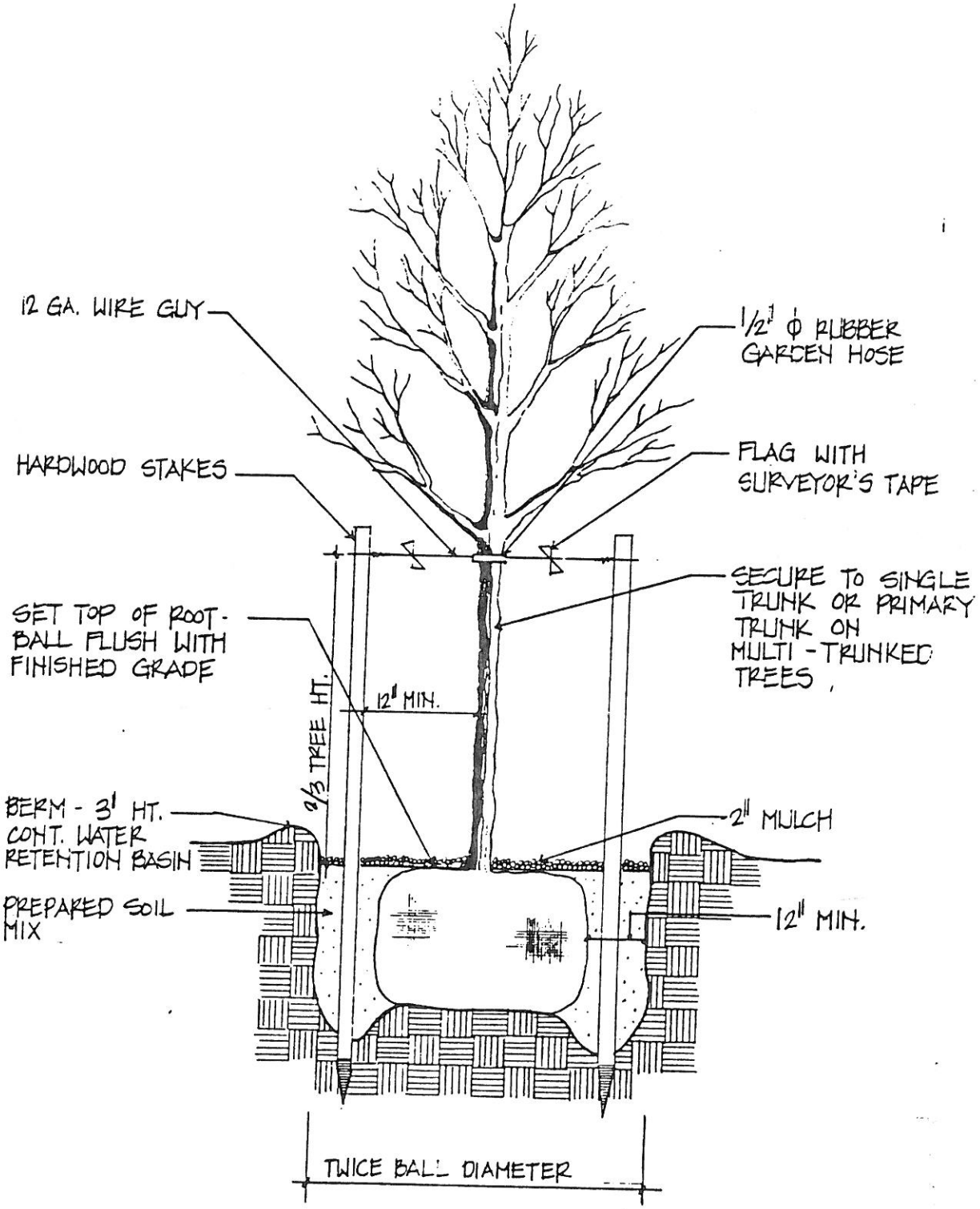
3.02 CLEANUP

A. All excess soil, soil preparation materials, and fertilizer shall be removed from the site upon completion of the work.

END OF SECTION



TYPICAL SHRUB PLANTING DETAIL



TYPICAL TREE PLANTING DETAIL

SECTION #02811
UNDERGROUND SPRINKLER IRRIGATION SYSTEM

PART 1 - GENERAL

1.01 WORK INCLUDED

A. Install a complete and operating underground sprinkler irrigation system.

B. The installation includes the furnishing of all labor, materials and equipment for the proper installation of the irrigation system. the work includes, but is not limited to the following;

1. All required fees and permits.
2. Trenching and backfill.
3. Automatically controlled irrigation system.
4. Test all systems and make operative.
5. As-Built drawings.

I.02 RELATED WORK

A. SECTION 02200 - EARTHWORK.

B. DIVISION I6 - Electrical Work: Power for Irrigation Controller(s).

I.03 CODES AND STANDARDS

A. All work under this Contract shall comply with all local and state codes having jurisdiction and with all requirements of the utility companies whose service may be used. All modifications required by these codes shall be made by the Contractor without additional charge to the school district. Where code requirements are less than those called for on the Plans or in these Specifications, folow the Plans and Specifications.

B.. All fees for permits, inspections, approvals, etc. of any nature whatsoever shall be paid for by the Contractor unless specifically stated otherwise. Contractor shall deliver to the Owner copies of all permits required.

I.04 QUALITY ASSURANCE

A. Installer... The installer shall be a Licensed Irrigator in the State of Texas and shall have a minimum of three years experience designing and installing irrigation systems of similar magnitude as this project. Installer shall submit a written statement attesting to the fact that Installer fulfills the above requirments. When the word "Contractor" is used in this section, it shall refer to the Installer.

B. Inspection of Site:

1. Contractor shall aacquaint himself with all site conditions. Should utilities not shown on the Contract Drawings be found during excavations, Contractor shall promptly notify the Architect/Engineer for instructions as to further action. Failure to do so with make Contractor liable for any and all damage thereto arising from his operations subsequent to discovery of such utilities not shown on Contract Drawings.

C. Coordination and Timing: Coordinate installation of irrigation system with related trades as necessary to prevent cutting, patching and unnecessary re-routing of piping.

1.05 SUBMITTALS

A. Submit written statement that Installer fulfills the requirement specified in 1.04, Paragraph A, of this Section.

B. Submit shop drawings and product data under provisions of Division 1.

C. Submit product data on pipe material, backflow preventors, controllers, remote control valves, automatic drain valves, valve boxes an sprinkler heads indicating size, material, manufacturer's name, catalog number and performance data.

1.06 PROJECT RECORD DOCUMENTS

A. The Contractor shall provide a neatly marked reproducible mylar plan showing triangulated locations of all valves and routing of main line pipe and wiring. These drawings shall indicate sizes and locations for all main lines, backflow preventors, branch lines, controllers, remote control valves, automatic drain valves and sprinkler heads.

B. A list of all products installed shall also be listed on the as-built drawings, indication item, size, material, manufacturer's name, catalog name and catalog number.

C. A copy of the as-built drawings shall be reduced in size, circuits color-keyed, and laminated in plastic. Drawing shall be reduced to a size that will fit inside controller box cover. Securely mount reduced, laminated drawing inside controller box cover.

1.07 GURANTEE AND MAINTENANCE INSTRUCTIONS

A. Standard one year guarantee stipulated in General Conditions shall included, but not be limited to the following:

1. Guarantee all workmanship, materials, fixtures and equipment to be free of defects.

2. Filling and repairing depressions and replacing plantings due to settlement or irrigation trenches for one year following acceptance of Project.

3. Guarantee that system will automatically drain adequately to protect from freeze damage.
4. Guarantee that system has been adjusted to supply proper coverage of ares to receive water.
5. Guarantee against all defects in material, equipment and workmanship.

B. After system is installed and approved, instruct Owner's Representative (to be designated by the Architect) in complete operation and matintenance for a period of not less than four hours during normal working hours.

C. Submit bound copy of manfacturer's operation and maintenance data for approval. Include written maintenance data on components of system and servicing requirements. Include component operation description, maintenance and inspection data, replacement part numbers and availability, and location and phone number of local service representative (within 50 mile radius).

I.08 PRODUCT STORAGE

A. During construction and storage, protect materials from damage and prolonged exposure to sunlight.

I.09 EXTRA STOCK

A. Final aceptance, provide the Owner with the following;

I. Two sprinkler heads of each size and type.
2. Two nozzles of each type.
3. Two valve keys for each type of valve box.
4. Two wrenches for removing and installing each type of head.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURES - SPRINKLER HEADS, CONTROLLERS AND CONTROL VALVES.

A. Hunter
B. Rainbird
C. Toro
D. Weathermatic

2.02 PIPE, PIPE FITTINGS AND CONNECTIONS

A. Pipe:

I. Main Pressure Lines: PVC, Class 200, SDR 21, PS 22-70.
a. 3" and larger: rubber gasket type.
b. 2-I/2" and smaller: solvent welded type.
2. Non-pressure or Lateral Lines: PVC, Class 200, SDR 21, PS 22-70. All solvent welded type.
3. Markings: All pipe and fittings shall have the following information

printed legibly in ink or molded thereon: manufacturer's name and trademark, material designation, diameter, schedule or class, and NSF logo/seal.

4. Swing Joints: King Brothers' O-ring seal type, or approved equal.

B. Fittings:

I. Solvent Weld Type: All lateral PVC pipe fittings shall be solvent weld type. Schedule 40, and of style recommended by the pipe manufacturer. No Class 200 PVC pipe is to be threaded for connection to metal pipe or metal accessories; use a threaded PVC adapter.

2. Rubber Gasket Type: Epoxy-coated steel fittings.

2.03 SPRINKLER RISERS

A. Rotary pop-up sprinkler or quick coupling valves shall have an adjustable riser assembly (three ell swing joint assembly) unless detailed othewise on Contract Drawings. These swing joint fittings shall be of schedule 40 PVC plastic and nipples schedule 80 (gray) PVC unless otherwise designated on Contract Drawings. Horizontal nipple parallel to side of lateral line shall be 8 inches long minimum. All other nipples on swing joint riser shall be of length required for proper instalation of sprinkler heads.

B. Stationary spray pop-up sprinkler heads, shrub spray heads, bubbler heads, and stationary spray sprinkler heads shall have risers made up one of the followng ways:

I. 4 inches flex-riser #FR-I00 connected directly to the lateral tee with an appropriately sized schedule 40 PVC threaded elbow and schedule 80 (gray) nipple.

2. Three schedule 40 street ells connected to lateral tee to form an adjustable riser or pop-up riser.

3. Risers for sprinkler heads my be I4 inch long minimum Toro #850-0I "Funny Pipe" with Toro #850-31 insert fittings, Rainbird swing pipe with spiral barb fittings or approved equal.

2.04 HEADS

A. Bubblers: Plastic pressure compensating type. Weathermatic No. I06 PC, Rainbird I404, or approved equal. Provide two bubblers per shrub or tree.

B. Pop-up spray heads: Rainbird Series I800-SAM-PRS (I804, I806, I8I2) with MPR plastic nozzle and filter screen or approved equal.

C. Turf rotor: Hunter Series I-25-ADS turf rotor, adjustable with check valve and stainless steel riser, with O-ring swing joint, or approved equal.

2.05 VALVES

A. Ball Valves: Ball valves shall have plastic bodies and internal assemblies designed for low-torque operation. Ball seals shall utilize Teflon and shall be self-adjusting for wear. Valves shall be Rainbird BLT valves, or approved equal.

B. Electric Section Control Valves: Heavy duty, bronze, contamination resistant. Weathermatic 8000CR or approved equal, 24 VAC electric solenoid valves

C. Quick - Coupling Valves: One inch diameter inlet and outlet, two piece , Rainbird No. 44RC with isolation valve, or approved equal. Provide one inch swivel hose-ell mounted on each coupler key. Provide one key for every two valves.

D. Automatic Drain Valves: Weathermatic No. 910, or approved equal.

2.06 CONTROLLER(S)

A. Provide automatic controller(s) with sufficient number of zones to serve areas designated on drawings to be irrigated.

B. Irri-Trol MC-Plus, pedestal-mounted. For each controller, provide SPD-587 surge protection, WCS Rainguard and Irri-Trol FC-I freeze sensor. Mount sensors in field as directed.

2.07 CONTROL WIRE AND CONNECTORS

A. Control Wire: All wire between the irrigation system controller and section control valves is to be single-strand solid copper, U.L. listed, Type UF, PVC insulated 14 guage. This wire is suitable for direct burial and conforms in all respects with the requirements for a N.E.C. Class II circuit (30 VAC or less). All wire is to be color coded so that the common wire is to have white insulation with a coordinated color strip matching the signal wire color for that controller. Signal wires are to be uniquely colored per controller.

B. Wire Connectors: All wire connectors are to have a two-piece PVC housing which, when filled with resin epoxy and pressed together, forms a permanent, one-piece, moisture-proof wire splice. All connectors are to be U.L. listed, rated 30 volt, for PVC insulated wire. No wire splices in the field will be allowed, except in valve boxes. Where splices are made in valve boxes, coil wire so that it can be lifted above grade for inspection.

2.08 VALVE BOXES

A. Provide a valve box for each of the following: 12" X 18"

1. All manual shut-off valves.
2. All sectional remote control valves.
3. All drain valves, whether manual or automatic 10"
4. All quick-coupling valves.

precedence of location over the proposed irrigation pipe. Conflicts that may occur between proposed drain pipes and irrigation pipes hsall be resolved by lowering the irrigation pipe and maintaining the drain line at its existing grade.

3.03 BACKFILLING

A. After installation of the pipe, the trenches shall be properly backfilled. Backfill around the pipe shall be rock free, and care shall be taken that no rocks or other debris rest against the pipe. The backfill shall be water puddled and tamped so as to leave no depression. Should depressions develop after completion of the work, the Contractor shall be c responsible for additional topsoil or other work to crrect these depressions. Where trenches are under paved or hadscape areas, backfill trenches in six (6) inch layers and mechanically tamp each layer.

3.04 SLEEVING

A. All pipe and wire that will be under paving or hardscape shall be placed in PVC Schedule 40 sleeves. The furnishing and installing of the sleeves shall be by the General Contractor.

3.05 PIPE LAYING

A. Polyvinyl chloride pipe sections, including both main and lateral lines, shall be installed according to manufacturer's specifications.

3.06 PIPE JOINTS

A. Solvent welded pipe shall be joined according to manufacturer's recommendations.

3.07 VALVE AND VALVE BOX PLACEMENT

A. Valves are to be installed in boxes, and shall be set with a minimum of six (6) inches of space between their top surface and the bottom of the valve box.

B. Valves shall be fully opened and fully closed to ensure that all parts are in operating condition.

C. Valve boxes shall be set plumb, vertical and concentric with the valve stem.

D. Any valve box which has moved from this position so as to prevent the use of a valve key on the operating wheel of the valve shall be reset by the Contractor at his own expense.

3.08 HEAD PLACEMENT

A. Heads shall be placed in accordance with good irrigation practice.

B. All heads shall be set one-quarter (0.25) inch above finish grade or flush to grade, not below.

C. All heads in the vicinity of pavement or hardscape shall be placed four to six (4-6) inches from the edge of the pavement or hardscape.

3.09 CONTROLLER (S)

A. Pedestal mount in mechanical room in accordance with manufacturer's instructions and details on Contract Drawings.

3.I0 HYDROSTATIC TESTS

A. General: Where any section of pressure line is provided, a hydrostatic test shall be made prior to totally backfilling the trench.

B. Pressure Test: After the main line pipe is in place, the solvent welded joints cured, the trench partially backfilled leaving joints exposed, and the concrete thrust blocks have cured, the piping or any valved section of main pressure line piping shall be subjected for two hours to a hydrostatic pressure test of I00 pounds per square inch. Each valve shall be opened and closed during the test. Exposed pipe, joints, fittings, and valves shall be carefully examined during the partially open trench test. Joints showing visible leakage shall be replace or remade as necessary. Cracked or defective piple, joints, fittings, or valves discovered as a consequence of this pressure test shall be removed and replace with sound material. The test shall be repeated until all material passes the test. All replacement and repaid shall be without additional expense to the Owner.

3.II OPERATIONAL TESTS

A. Upon completion of the installation, the entire system shall be tested for proper operation and distribution of water. Adjustment to the radius of spray and arc of operation for all heads shall be completed by the Contractor prior to the final inspection. The Contractor shall instruct the Owner in the operation and maintenance of the system.

3.12 CLEAN UP

A. Upon completion of the work covered in this project, all debris, rock and surplus material resulting from the work shall be removed from the project site by the Contractor

END OF SECTION

SECTION 02930

LAWN - HYDRO-MULCHING

Part I - GENERAL

I.0I SUMMARY

A. Section Includeds: Soil preparation, fertilization, planting, and other requirements regarding hydro-mulching operations.

B. Related Sections:

I. Section 02200 - Earthwork: topsoil.

I.02 SUBMITTALS

A. Product Data: Submit in accordance with Section 0I340. Submit a sample label or specification for each type of fertilizer.

I.03 QUALITY ASSURANCE

A. Establishment and Acceptance: Regardless of unseasonable climatic conditions or other adverse conditions afftecting planting operations and the growth of the grass, it shall be the sole responsiblity of the Contractor to establish a uniform stand of grass. When adverse conditons such as drought, cold weather, high winds, excessive precipitation, or other factors prevail to such an extent that satisfactory results are unlikely, the Owner may, at his own discretion, stop any phase of the work until conditions change to favor the establishment of grass.

I. Uniform Stand of Grass: A uniform stand with complete coverage of the specified grass shall be defined as not less than I50 growing plants per square foot for seeded areas.

B. Post Planting Maintenance: Maintenance shall begin immediately after each portion of grass area is planted. All planted areas will be protected and maintained by watering, weeding, and replanting as necessary until receipt by Owner of Certificate of Occupancy or as much longer as necessary to establish a uniform stand with complete coverage of the specified grass. Grass shall be mowed once a week by the Contractor until final acceptance. All water equipment deemed necessary by the Contractor will be provided by the Contractor. Contractor will pay for all water required for watering.

I.04 WARRANTY

A. Grass shall be guaranteed by the Contractor for 30 days after the date of substantial completion for the project, or attainment of the required stand of grass, which ever is later. During this time, the Contractor shall be responsible for all watering, weeding, mowing, fertilization, other maintenance as required, and replanting.

I. At the end of the 30-day warranty period, the grass will be reinspected

by the Owner and the defective areas will be repaired or replaced by the Contractor

2. The grass wil be re-inspected in subsequent 30-day intervals as required until all defective areas comply with subsection 3.0l D. All costs associated with the initial 30-day warranty period and subsequent 30-day period, if required, shall be the responsiblity of the Contractor.

PART 2 - PRODUCTS

2.0l MATERIALS

A. Bermudagrass Seed: Grass seed shall be "Cynodon Dactylon" (CommonBermudagrass). The seed shall be harvested within l year prior to planting; free of Johnsongrass, field bind weed, doddler see, and free of other week seed to the limits allowable under the Federal Seed Act and applicable seed laws. The seed shall not be a mixture. The seed shall be hulled, extra fancy grade, treated with fungicide, and have a germination and purity that will produce, after allowance for Federal Seed Act tolerance, a pure live seed contnet of not less that 85%, using the formula: purity % times (germination % times plus hard or sound seed %). Seed shall be labeled in accordance with U.S. Department of Agriculture

B. Buffalograss * See attached.

C. Fertilizer: Fertilizer shall be a commercial product, uniform in composition, free flowing, and suitable for application with approved equipment. Fertilizer shall be delivered to the site in fully labeled original containers. Fertilizer which has been exposed to high hymidity and moisture, has become caked or otherwide damaged making it unsuitable for use will not be acceptable.

l. Initial Planting Application: Fertilizer for the initial planting application shall be of an organic base containing by weight the following (or other approved) percentages of nutrients: 21-0-0 (N-P-K) ammonium sulfate or the nitrogen equivalent of 33-0-0 ammonium nitrate.

D. Hydro-Mulch: Provide Conwed Hydro-Mulch. All mulch will be manufactured from hardwoods only and will be refined specifially for lawn hydro-mulch applications.

E. Roundup: Apply Roundup to all areas to receive grass to remove all undersirable plant growth.

F. Topsoil shall be as described in Section 02200.

PART 3 - EXECUTION

3.0l INSTALLATION

A. Soil Prepartion:

I. Tillage: Tillage shall be accomplished to loosen the soil, destrop existing vegetation, and prepare an acceptabel seed bed. All areas shall be tilled with heavy duty disc or chisel-type breaking plow, chisels set not more than 8" apart. Initial tillage shall be done in a crossing pattern for double coverage, then followed by a disc harrow. Depth of tillage shall be 6"

2. Cleaning: All rock and clods 3/4" in size or larger shall be removed from the fine graded area. Soil shall be further prepared by the removal of debris, including building materials, rubbish, weeds, concrete chips and small pieces of wood, regardless of size.

3. Fine Grading: After tillage and cleaning, all areas to be planted shall be leveled, fine grades, and drug with a weighted spike harrow or float drag. The required result shall be the elimination of ruts or depressions that would cause water to stand or pond immediately after rainfall or operation of the lawn irrigation system, humps, and objectionable soil clods. This shall be the final soil preparation step to be completed before the commencement of fertilizing and planting.

B. Fertilizing:

I. Initial Planting Application: The specified fertilizer shall be applied at the rate of l8 pounds per l,000 square feet (800 pounds per acre).

a. Timing: The initial planting application of fertilizer shall be applied after the soil preparation, but not more than 2 days prior to grass planting. Fertilizer shall be applied over sod after planting, but not more than 2 days later.

2. Post Planting Application: Thirty days after planting, grass areas shall receive an application of 21-0-0 or 33-0-0 fertilizer at the rate of 9 pounds per l,000 square feet (400 pounds per acre).

a. Timing: The Architect will determine if it is too late in the growing season for the post planting application. In the event that it is, the application shall be made in the spring of the next year, or the cost of the application shall become a credit due to the Owner.

3. Post Planting Maintenance: Areas without a uniform stand (complete coverage) shall receive subsequent applications of fertilizer, as described above, every 30 days until a uniform stand is achieved.

C. Planting

I. Hydroseeding: Following soild preparation, Bermudagrass seed, fertilizer, mulch, and water shall be mixed together and applied to the planting area in the following quantities and rates using conventional "Hydro-Mulch" equipment as manufactured by the Bowie Machine Works:

ITEM	RATE PER ACRE
Grass Seed - BERMUDA	110 pounds
Fertilizer	800 pounds
Water	As needed
Wood Fiber Mulch	Minimum as needed to achieve marking of seeded areas.

BUFFALO *SEE ATTACHED

a. Timing: Under no circumstances shall grassing operations occur in planting periods other than the following: April 15 to August 15 of the year of project substantial competion. If grassing operations cannot be acomplished during these periods the Contractor shall estalish an inerim stand of winter rye grass, then reove the rye and provide specified grass during the next period in the following year.

D. Acceptance of grass for the purpose of establishing the date of Substantial Completion and subsequent re-inspections shall be base on the following minimum requirements.

1. Grass must indicate weed-free uniform, healthy, and vigorous growth, devoid of discoloration and signs of dehydration.
2. The grade shall be free of low or hollow places so that water shall not stand or pond during rains or irrigation operation.
3. Grass shall be firmly rooted so that sections cannot be removed.

E. Protection: No heavy equipment shall be moved over the planted lawn area unless the soil is again prepared, graded, leveled, and replanted. Protect all paving surfaces, curbs, utilities, plant materials and any other existing improvements from damage by heavy equipment. Any damages shall be repaired or replaced at no cost to the Owner.

F. Erosion Control: Throughout the project and the maintenance period for grass, it is the Contractor's responsiblity to maintain the topsoil in place at specified grades. Topsoil and grass losses due to erosion shall be replaced by the Contractor until establishment and acceptance is achieved.

G. Clean Up: Contractor shall remove excess material or debris brought onto the site or unearthed as a result of hydro-mulching operations

*A. Buffalograss Seed: Turfgrass seed shall be "Buchloe dactyloides" (Buffalograss). The seed shall be harvested within one (1) year prior to planting, free of Johnsongrass, field bind weed, dodder seed, and free of other weed seed to the limits allowable under the Federal Seed Act and applicable seed laws. The seed shall not be a mixture. The seed shall be treated with fungicide. Seed shall be labeled in accordance with U.S.

Department of Agruiculture rules and regulations.

I. Certificate Submittal: Prior to planting, provide the Owner or his representative with the State Certificate stating analysis of purity and germination of seed.

END OF SECTION

SECTION 02950

GROUNDCOVER PLANTING

PART I - GENERAL

I.0I SUMMARY

A. Section Includes: Planting groundcover.

B. Retlated Sections:

I. Section 02200 - Earthwork: topsoil.

I.03 REFERENCES

A. Standards:

I. American Standard for Nursery Stock, Current Edition as published by the American Assoication of Nurseymen.

2. American Joint Committee on Horticulture Nomenclature, I942 Editon of Standardized Plant Names.

I.04 WARRANTY

A. All groundcover shall be guaranteed for six months, which begins upon acceptance of work by the Architect. At the end of the guarantee period, inspection will be made by the Owner. Any plant material required under this contract that is dead or not in satisfactory growth conditon shall be removed and replaced with the same size and kind of plant specified, at not cost to the Owner.

PART 2 - PRODUCTS

2.0I GROUNDCOVER PLANTS

A. Plant Names and Locations: As noted on the drawings.

B. Quality and Sizes: All plant materials shall be first class representatives of their nornal species or variety, having a habit of growth nornal for the species, and shall be healthy, shapely, well-rooted, and vigorous. All plant material shall be free from insect pests, plant diseases, and injuries. The containers and balls of plants shall be feee from any weeds or grasses which could be considered noxious or objectionale, specifically nutgrass or Johnsongrass. All plant materials shall be equal to or exceed the measurements specified on the drawings.

C. Packaging Container grown plants, designated as "gal. can" on the drawings, shall be full or heavy grade and shall have been growing in the specified size container for one full season prior to delivery to the site.

2.02 PLANTING MATERIALS

A. Topsoil: All planting bed topsoild shall be "Acid Gro Complete Mix" produced by Soil Building Systems, Inc., Dallas, TX.

B. Mulch shall consist of horticultural grade, nugget pine, redwood, fir or cypress bark (decor bark) free of sticks, stones, clay, or other foreign materials. The bark must be in nuggets of 3/4" to I", graded size, and

must be of such character as not to be easily displace by wind.

C. Root activator shall be Green Light or Ortho brand.

D. Soil sterilant shall be "Vapam" , manufactured by Green Light Co.

E. Weed controller shall be "Round-up" as manufactured by Monsanto, Inc.

F. Water: Clean and potable.

PART 3 - EXECUTION

3.0l GROUNDCOVER PLANTING

A. Layout: All planting locations shall be staked and approved by the Architect prior to digging the planting beds.

B. Bed Preparation:

l. All planting beds shall be excavated to 5" below finished grade and all debris, stone, rubbish, weeds, and topsoild shall be removed.

2. The subgrade shall then be tilled to a dept of 3".

3. The planting bed shall be backfilled with topsoil --"Acid Gro Complete Mix."

4. After planting the beds shall be l" above finished grade to allow for settling.

C. Setting the Plants:

l. Plant in pits, centered, and set to touch such depth that the finished grade level at the plant after setttlement will be the same as that at which the plant was grown.

2. Plant upright and faced to give the best appearance or relationship to adjacent plants or structures.

3. Cut off broken or frayed roots.

4. Place an compact carefully prepared soil to avoid injury to roots and to fill all voids.

5. When the hole is nearly finished, add water and root activator and allow it to soak away.

6. Fill the hole to finished grade.

D. Mulching: Mulch the entire area between the plants, regardless of plant spacing, with a 2" deep layer of mulch material.

3.02 CLEAN UP

A. All excess soil, soil prepartion materials, fertilizer, or plant containers shall be revoved from the site upon completion of the work.

3.03 MAINTENANCE

A. Contractor shall be responsible for watering, cultivating, and other necessary maintenance until the completion and acceptane of all work.

B. Upon acceptance of the groundcover planting, deliver to the Owner a brief, written maintenance guide describing recommended planting

maintenance procedure, methods, products, quantities, and timing.

END OF SECTION

1.00 GENERAL

1.01 RELATED DOCUMENTS

A. The general provisions of the Contract, including General Conditions, Supplementary Conditions and Special Conditions, if any, apply to the work specified in this section.

1.02 SCOPE OF WORK

A. The work under this section of the specifications entitled consists of furnishing all materials, supervision, labor, equipment, appliances and services necessary for and incidental to completing all operations in connection with these specifications and the applicable drawings, and subject to the terms of the Contract. In general the work shall include, but is not to be limited to, the following within the Contract limit line.

2.00 MATERIALS

2.01 STEEL EDGING

A. Steel edging shall be green colored steel, 1/8" x 4" with 12" steel spikes.

3.00 INSTALLATION

3.01 LAYOUT

A. Stake or mark edging location for the Architect's approval prior to start of installation.

3.02 SETTING

A. Dig trench and place edging perpendicular to finish grade and one inch above finish grade. Drive stakes in each location provided by the manufacturer and on each side of any end cut wherever a manufacturer's slit is not located.

3.03 FINISHING

A. Backfill with the appropriate soil mix on each side of the edging. Tamp soil on both sides at the same time so as not to cause "wiggles" in the edging. Steel edging with wiggles in the line will be removed and replaced with new edging ,if too severe to be corrected by redoing.

SECTION 02920 - TOPSOILING

- GENERAL

SUMMARY (Not Applicable)

REFERENCES (Not Applicable)

SUBMITTALS

The following shall be submitted in accordance with SECTION 01300 - SUBMITTALS:

SD-43, Construction Equipment List

The Contractor shall furnish a list and description of the equipment that is proposed for handling and placing all topsoil.

SD-76, Certificate of Compliance

The Contractor shall furnish a certificate of compliance and analysis certifying that the topsoil proposed for use at the project site conforms to the specified requirements.

INSPECTION

Not less than 5 days prior to the commencement of topsoiling operations, the Contracting Officer shall be notified of the offsite sources from which topsoil is to be furnished. The material will be inspected to determine whether the selected topsoil meets the requirements. The topsoil shall be approved prior to use.

METHOD OF MEASUREMENT

The unit of measurement for topsoiling shall be the cubic yard. The yardage to be paid for shall be the number of cubic yards of topsoil excavated from the designated source. The volume will be computed between the actual lines and grades to which topsoil excavation has been made and the original ground surface as determined by the initial survey.

PAYMENT

Topsoil will be paid for at the contract price per cubic yard for topsoil furnished and placed as specified, which payment shall constitute full compensation for all work covered by this section of the specifications.

PART 2 - PRODUCTS

2.1 TOPSOIL

All topsoil necessary to complete the work shall be obtained from topsoil stockpiles from grading and excavating operations and from approved topsoil sources off of Government controlled property. Topsoil from approved sources and stockpiled topsoil shall be natural, friable, topsoil characteristic of representative soils in the vicinity that produce heavy growths of crops, grass, or other vegetation. Topsoil shall be free from tree roots, stones, shale, parent and other materials that hinder grading, planting, plant growth and maintenance operations, and free from noxious and other objectionable weed seeds and toxic substances.

PART 3 - EXECUTION

3.1 GENERAL

Graded areas shall be topsoiled where it is determined by the Contracting Officer that at least 6 inches of suitable soil for the growth of grass is not present. Equipment necessary for handling and placing all materials required shall be on hand, in good condition and shall be approved before the work is started. Grades on the areas to be topsoiled are shown on the drawings and shall be maintained in a true and even condition. 12 inches of gravel material shall be removed from existing berms and replaced with 12 inches of suitable topsoil.

3.2 TILLAGE

Immediately prior to dumping and spreading the topsoil, the subgrade shall be double tilled to a depth of 2 inches using a chisel plow with the 1 chisels set not more than 10 inches apart. Tillage shall be accomplished across the slope.

3.3 OBTAINING TOPSOIL

After inspection and approval of the source of topsoil, and prior to stripping, rank growths of vegetation, stones, or debris on the surface that might interfere with grading or later tillage operations shall be removed. Sod or other cover that cannot be disked or otherwise incorporated into the topsoil so that the topsoil can be spread properly shall be removed. Topsoil shall be removed to the depth specified by the Contracting Officer.

3.4 PLACING TOPSOIL

Topsoil shall be uniformly distributed and evenly spread to an average thickness of 6 inches, with a minimum thickness of 5 inches. Topsoil shall be spread so that planting can proceed with little additional soil preparation or tillage. Surface irregularities resulting from topsoiling or other operations shall be leveled to prevent depressions. The grades shall be

adjusted to assure that the planted grade shall be 1 inch below the adjoining grade of any surfaced area. Topsoil shall not be placed when the subgrade is frozen, excessively wet or compacted, extremely dry, or in a condition detrimental to the proposed planting or grading.

CLEANUP

Prior to topsoiling, vegetation that may interfere with operations shall be mowed, grubbed, and raked. The collected material shall be removed from the site. The surface shall be cleaned of stumps, and stones larger than 1 inch in diameter, and roots, cable, wire and other materials that might hinder the work or subsequent maintenance shall also be removed.

REPAIR

Where any portion of the surfaces becomes gullied or otherwise damaged, the affected area shall be repaired to establish the condition and grade prior to topsoiling, and then shall be re-topsoiled as specified in paragraph covering PLACING TOPSOIL.

- - o 0 o - -

CLAYCOMB
ASSOCIATES, ARCHITECTS

Claycomb Associates, Inc.
~~5401 North Central Expy.~~
~~Suite 315 - Dallas, Texas 75205~~
~~(214) 526-2090~~

TRANSMITTAL

DATE: August 24, 1992

JOB NO:

TO: Julie Couch,
Assistant City Manager
City of Rockwall

PROJECT: Rockwall High School

GENTLEMEN:

We are enclosing (herewith) (~~under separate cover~~) the following items:

Landscape and Irrigation Construction Documents for the New High School.

REMARKS:

By: Edwards

CITY OF ROCKWALL
Planning and Zoning Agenda

Agenda Date: September 10, 1992 **Agenda No:** IV. A.

Agenda Item: P&Z 92-37-L - Discuss and Consider Recommending Approval of the high School Landscape Plan

Item Generated By: RISD

Action Needed: Discuss the plan and take any necessary action.

Background Information:

The school has submitted its landscaping plan for the new high school site in accordance with the facilities agreement. The plan as submitted meets all of the City's requirements, however, the Commission needs to discuss the tree requirement along Yellowjacket Lane and Greencrest. Under the landscaping ordinance street trees are required along these roadways equal to 1 tree per every 50 feet of frontage. This site is bounded by one arterial and two collector streets. Based upon the frontage the school would need a total of 73 street trees. They would also need a total of 34 trees internal to the parking lots. The ordinance permits tree credits of up to 50% of the total tree requirements based on the number and size of existing trees. The school would be eligible for the 50% credit, which brings the total number of required trees down to 54. The school is proposing to provide 59 new trees in the parking lots. They do not want to provide any additional trees along the street frontages. Given the amount of landscaping that the school is showing to be installed, and the fact that a number of the trees that are to be installed, it would be my recommendation that the plan as submitted meets the intent of the City's requirements.

Attachments:

1. Copy of the landscaping plan

CITY OF ROCKWALL
City Council Agenda

Agenda Date: September 21, 1992 **Agenda No:** VI. A.

Agenda Item: P&Z 92-37-L - Discuss and Consider Approval of the High School Landscape Plan

Item Generated By: RISD

Action Needed: Discuss the plan and take any necessary action.

Background Information:

The school has submitted its landscaping plan for the new high school site in accordance with the facilities agreement. The plan as submitted meets all of the City's requirements. However, the Council needs to discuss the tree requirement along Yellowjacket Lane, Greencrest and Kyle Drive. Under the landscaping ordinance street trees are required along these roadways equal to 1 tree per every 50 feet of frontage. This site is bounded by one arterial and two collector streets. Based upon the frontage the school would need a total of 73 street trees. They would also need a total of 34 trees internal to the parking lots. The ordinance permits tree credits of up to 50% of the total tree requirements based on the number and size of existing trees. The school would be eligible for the 50% credit, which brings the total number of required trees down to 54. The school is proposing to provide 59 new trees in the parking lots. The plans along the roadways provide for a number of trees but, other than the existing trees all of the trees proposed for planting within the 10 foot buffer area are less than the 3" caliper. Overall, the school will be planting over 300 trees on the site in addition to shrubs and planting beds. Given the amount of landscaping that the school is showing to be installed, and the number of the trees that are to be installed, it would be my recommendation that the plan as submitted meets the intent of the City's requirements. The plans are voluminous and we will have them delivered under separate cover.

The Commission has recommended approval of the plan as submitted.

Attachments:

1. Copy of the landscaping plan under separate cover