KATHLEEN BABINEAUX BLANCO
GOVERNOR

STATE OF LOUISIANA
DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT
P.O. Box 94245
Baton Rouge, Louisiana 70804-9245
www.dotd.louisiana.gov
225-379-1485

JOHNNY B. BRADBERRY
SECRETARY

June 13, 2007

STATE PROJECT NO. 737-92-0035
FEDERAL AID PROJECT NO. 3602(521)
REGIONAL TRANSPORTATION MANAGEMENT CENTER DOTD/RPC
ORLEANS PARISH

SUBJECT: ADDENDUM NO. 5 (CONSTRUCTION PROPOSAL REVISION)

Gentlemen:

Attached are the construction proposal revisions dated 06/13/2007 on the captioned project for which bids will be received on Wednesday, June 20, 2007.

1. Revised the Project Manuals for Regional Transportation Management Center DOTD/ RPC vols. 1 & 2.
   a) Added the specifications entitled **Irrigation Systems, Landscaping, and Lawn**. These specifications were unintentionally omitted from architectural specifications compact disk. (23 pages)

Please note these revisions in the proposal previously furnished you and bid accordingly.

Very truly yours,

Randal D. Sanders

RANDAL D. SANDERS, P. E.
CONTRACTS & SPECIFICATIONS ENGINEER

Attachments
pc: Mr. Brian Buckel
Mr. Michael Stack
Mr. Ken Zito
Mr. Frank Standige
Mr. Steven Glascock
Ms. Margaret Thompson
Mr. John Oglesby
Mr. Masood Rasoulian

FOR INFORMATION ONLY

SECTION 02810

IRRIGATION SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

A These Specifications are to be used as a guideline to provide an automatic zoned sprinkler system for the appropriate planting, sodded, seeded and natural areas of the site. The information contained herein is set forth as a guide and should not be construed to limit the Contractor's responsibility to provide a complete and functional irrigation system which meets all applicable local codes.

B The Contractor and his subcontractors shall visit the site of the proposed work to familiarize themselves with the existing conditions so that they fully understand the facilities, physical conditions and restrictions pertaining to their work.

C These standards and Specifications cover irrigation requirements, water quality, materials, installation, inspection, testing and warranties for such systems.

D Within the scope of these documents, irrigation design is defined as the science and art of properly selecting and applying all components within the system.

1.2 EXCEPTIONS

A It is recognized that the practice of irrigation design and installation varies considerably depending on geographic location, prevalent soil and climatic conditions, type of plant material to be irrigated and the use for which the land is to be used. The standards set forth herein are for the purpose of providing guidance to the Contractor; specific conditions may require a deviation from them. If it is necessary to deviate from these standards, the Contractor shall submit in writing to the Landscape Architect:

1 The nature of the deviation.
2 The reason for the deviation, and
3 Justification for the standard used.

1.3 QUALITY ASSURANCE

A Irrigation Contractor: the work shall be performed by qualified irrigation installers working under the direction of an experienced licensed supervisor.

1 The Contractor, when requested by the Owner, shall submit references showing satisfactory work performed on similar size projects. The contractor, at discretion of the General Contractor, may be required to post a performance bond. Unless otherwise specified, it is the responsibility of the Contractor to provide insurance, inspections, bonds, samplings testing, and permits necessary to accomplish the work. Deviations from

specified equipment must be approved in writing in advance of installation by the Owner or his representative. Supportive documents shall be provided to provide acceptability

1.4 SUBMITTALS

A List of Materials: Provide a list of materials with the bid proposal prior to start of construction. Include all items to be provided for the complete installation of the irrigation system. All items on the list of materials should include product descriptions, manufacturer's model number, and size.

B Manufacturer's Operating Instructions: Provide the manufacturer's recommended operating instructions for all products incorporated into the irrigation system.

C Recommended Operating Instructions: Provide recommended operating instructions and maintenance schedules for the system.

D Catalog Sheets: Submit catalog cut sheets or copies thereof for items on the material list.

E As Built Drawings: Legibly mark on a set of Shop Drawings to record actual head location as well as pipe and wire routes. The following items should be included:

1 Mainline and lateral pipe sizes.
2 Control Valves.
3 Sprinkler locations.
4 Detail Sheets

F Testing and Inspection Certifications: Provide all required testing and inspection certifications to the Owner or General Contractor with the final application for payment.

G Material and Equipment Warranties: The irrigation contractor shall assume full responsibility for the proper installation of the system. System components specified shall be installed only within the capabilities and limitations stated by the manufacturer, by these standards and any applicable codes. The irrigation system contractor shall make all necessary, reasonable efforts to handle any warranty claims within 15 days of the receipt of the claim. Contractor shall guarantee he installation, workmanship to be free from defects for a period of one year from date of completion.

PART 2 - PRODUCTS

2.1 PIPE AND FITTINGS

A All main line to be Class 200 PVC pipe. All circuit pipe to be Class 200 PVC pipe. Pipe from meter to Backflow Preventer shall be Type K copper water tube or as required by local codes.

B All solvent weld PVC fittings shall at a minimum, meet the requirements of SCH as set forth in ASTM D-2466.

C Threaded PVC fittings shall meet the requirements of SCH 80 as set forth in ASTM D-2464.

D Perform all solvent welds in accordance with ASTM D-2855.

2.2 ROTOR HEADS (if applicable)

A The sprinkler shall be of the gear-driven rotary type, capable of covering a 26' to 48' radius at 50 PSI with a discharge rate of .7 to 12.2 GPM. The sprinkler shall be available with twelve (12) nozzles discharging from .5 to 14.4 GPM. The sprinkler shall have radius adjustment capabilities by means of a stainless steel nozzle-retainer/radius-adjustment screw.

B The sprinkler shall be available in both full circle and adjustable part circle configurations. The adjustable part circle unit shall be infinitely adjustable from 40 degrees to 360 degree. The adjustable unit shall have the capability for adjustment in all phases of installation, i.e. before installation, after installation and after installation while in operation. The pop-up sprinkler shall have a ratcheting tye riser assemble for final arc orientation.

C The sprinkler shall have a minimum 4 inch pop-up stroke to bring the rotating nozzle turret into a clean environment. The sprinkler shall be available at an above ground shrub head (PGS) and in ground (PGS). The sprinkler shall have an exposed surface diameter after installation of 1¾ inches and have an overall height of 7□ inches. The unit shall have a ¾ inch NPT inlet. The sprinkler shall be serviceable after installation in the field by unscrewing the body cap, removing the riser assembly and cleaning inlet filter screen.

D The body and riser of the sprinkler shall be constructed of non-corrosive, heavy duty ABS. The sprinkler shall carry a two-year over-the counter exchange warranty, (not prorated).

E The sprinkler shall be manufactured by Hunter Industries, San Marcos, California.

2.3 SPRAY HEADS

A Spray heads should be selected in accordance with the size of the area and the type of plant material to be irrigated.

B Equipment shall be protected from contamination and damage by use of seals, screens, and springs where site conditions present a potential for damage.

C The full or part circle pop-up spray type sprinkler shall be capable of covering up to 15 feet radius (FT.RAD.) at 30 pounds per square inch (PSI) with a discharge rate of .39-3.7 gallons per minute (GPM).

1 The sprinkler body, stem, nozzle and screen shall be constructed of heavy duty plastic.
2 The sprinkler shall have a seating surface which seals against the bottom case inlet, preventing low head drainage. The seal shall hold back pressure equivalent to 10 feet of head. The sealing device shall be an integral part of the pop-up stem and shall be removable through the top of the sprinkler.
3 The sealing device shall be an integral part of the pop-up stem and shall be removable through the top of the sprinkler.

4 The sprinkler shall have a soft elastomer pressure activated co-molded wiper seal for cleaning debris from pop-up stem as it retracts into case to prevent sprinkler from sticking up.

5 The sprinkler shall have a matched precipitation rate (MPR) plastic or brass nozzle with an adjusting screw capable of regulating the radius and flow.

6 The sprinkler shall have a strong stainless steel retract spring for positive pop-down. Pop-up height shall be no less than 4 inches.

7 The 1806 and 1812 shall have a ratcheting system for easy alignment of pattern.

8 The sprinkler shall have a screen under the nozzle to protect it from clogging and for easy removal for cleaning and flushing system.

9 The sprinkler shall be manufactured by Rain Bird Sprinkler Mfg. Corp., Glendora, California, or approved equal.

D Support riser mounted sprinklers to minimize movement of the riser resulting from the action of the sprinkler.

E Swing joints shall be constructed to provide a flexible, leak-free connection between the sprinkler and lateral pipeline to allow movement in any directions and to prevent equipment damage.

2.4 VALVES

A The remote control valve shall be a normally closed 24 VAC solenoid-actuated globe pattern spring loaded diaphragm type having a flow rate of 5 gallons per minute (GPM). The valve shall be pressure rated up to 200 PSI at 150 degrees F. The solenoid shall be low power 9.9 VA inrush and a 5.5 VA Holding. The valve shall have a 600 pound test fabric reinforced rubber diaphragm assembly with a self-cleaning stainless steel screen. The body and bonnet shall be of glass-filled nylon and the valve shall have a flow control/shut-off stem and manual operator. The valve shall provide for all internal parts to be removable from the top without disturbing the valve installation.

2.5 VALVE BOXES

A Use valve boxes that are constructed to withstand traffic loads common to the area in which they are installed. They should be sized to allow maintenance of the enclosed valves without excavation.

B Each box should be permanently labeled to identify its contents.

C Boxes to be as manufactured by AMETEK, Sheboygan, WS or approved equal.

2.6 LOW VOLTAGE WIRING

A All low voltage wiring which is directly buried must be 14 GA UL/UF APPROVED FOR DIRECT BURIAL.

B Connections are to be made in a waterproof fashion using devices specifically designed for direct burial

2.7 IRRIGATION CONTROLLERS

A. Irrigation controller or controllers shall be installed in a central location to be determined by the Owner or the Owner's representative.

2.8 REQUIRED SLEEVES

A All pipes passing under concrete or paving material are to be sleeved in SCH 40 PVC sized at 2 times the diameter of the pipe which it encases.

B Timing Device: Adjustable, 24-hour, 14-day clock, with automatic operations to skip operation.

PART 3 - EXECUTION

3.1 WATER SUPPLY

A Water will be supplied by an existing water meter. The Contractor will be responsible for all costs and coordination in association with tying into the existing water line as close as practical.

3.2 APPLICATION RATES

A Application Rates will vary depending on climate, type of plants to be watered, and type of adding or deleting time on the controller.

1 Spray heads have a rate of 1.83 IN/HR (triangular spacing).
2 Rotor heads have a rate of .51 IN/HR(triangular spacing).

3.3 IRRIGATION REQUIREMENTS

A The irrigation system should normally be capable of meting the peak water use requirement of the turf or landscape when operated no more than 8 hours per day. Estimate the peak water used based on the type of vegetation and local climatic conditions.

3.4 IRRIGATION SYSTEM DEMAND

A An estimation of the volume of water required for each irrigation shall accompany each set of Drawings.

3.5 SPRINKLER/EMITTER SPACING

A Space all heads to throw head-to-head to achieve the most even precipitation rate throughout the area to be irrigated.

3.6 PIPELINES

A Pipelines are sized to limit pressure variations so that the working pressure will be in the range required for uniform water application at all points in the irrigation system.

B Pipe Selection: Pipeline diameters are selected to limit velocities to 5 feet per second.

3.7 CONTROL VALVES

A Control Valve Size: Control valve size is based on the flow rate through the valve and the manufacturer's recommendations with emphasis on friction loss.

1. Control valves will be electrically actuated normally closed in nature.

2. Size electrical circuit wire in accordance with the valve manufacturer's specifications. Circuit wire is to be direct buried and shall be UL/UF approved.

3.8 AUTOMATICC IRRIGATION CONTROLLERS

A Automatic irrigation controllers are selected to satisfy the needs of the system for each exhibit. Controllers shall have an adequate number of stations to satisfy the requirements of the irrigation system design. Each controller shall have a separate grounding system as well as its own lightning protection.

3.9 PRE-INSTALLATION

A Obtain location of existing utilities from municipal and private utilities and from the property Owner/General Contractor.

B Confirm compliance with all applicable local codes. Obtain all necessary permits.

C Inspect the site for existing conditions that will affect the irrigation system design or installation, and develop a plan to minimize disturbance of existing structure and landscape.

3.10 PIPE INSTALLATION

A Flag the location of all sprinklers, valves, controllers, source of water and electrical components in the field prior to installation.

B Conduct all necessary excavation for the proper installation of pipelines and accessories. After installation, backfill and compact the excavated soil to minimize post-construction settlement in the pipe trench. Remove water, shore and brace as needed to completely install the pipe.

C Pipe should be installed at sufficient depth below ground to protect from hazards such as vehicular traffic and freeze damage.

D Make all pipe joints and connections according to manufacturer's recommendations.

E Native excavated material may be used to backfill the pipe trench. However, the initial backfill material shall be free from rocks or stones larger than 1 inch in diameter. At the time of placement, the moisture content of the material shall be such that the required degree of compaction can be obtained with the backfill method to be used. The initial backfill material shall be placed so that the pipe will not be displaced, excessively deformed, or damaged. The initial fill shall be compacted firmly around and above the pipe as required to provide adequate lateral support to the pipe.

1. If the water packing method is used, the pipeline first shall be filled with water. The initial backfill before wetting shall be of sufficient depth to insure complete coverage of the pipe after consolidation. Waterpacking is accomplished by adding enough water to diked lengths of the trench to thoroughly saturate the initial backfill without excessive pooling. After the backfill is saturated, the pipeline shall remain full of water until after the final backfill is made. The wetted fill shall be allowed to dry until firm before beginning the final backfill.

F The trench bottom must be uniform, free of debris, and of sufficient width to properly place pipe and support it over its entire length. Blocking or mounding shall not be used to bring the pipe to final grade.

G Ends of pipe shall be closed to prevent entry of foreign materials when pipe laying is not in progress.

H Pipe sleeves must be used to protect pipes or wires installed under pavement or roadways. Use pipe sleeves two pipe sizes larger than the carrier pipe or twice the diameter of the wire bundle to be placed under the paving or roadway, and extending a minimum of 2 feet beyond the paved area. Use sleeve pipe with wall thickness at least equal to the thickness of Schedule 40.

1. Piping under paved traffic areas shall be encased in full lengths of conduit to avoid placement of joints under pavement if possible. Use the same techniques to place pipe sleeves to serve as conduits for automatic control wires or tubing. Sleeve material may be steel or plastic pipe, suitable to slide pipe, wire or tubing through. Proper backfill and compaction procedures shall be followed. The Contractor is responsible for installation of all sleeves. No sleeves are in place under paving on site.

3.11 CONTROL VALVE INSTALLATION

A Valve installation shall allow enough clearance for proper operation and maintenance. Where valves are installed underground, they shall be provided with a valve box with cover extending from grade to the body of the valve. The top of th4 valve body shall have a minimum of 6 inches to cover in non-traffic and non-cultivated areas and 18 inches of cover in traffic areas.

B Control valves shall be placed along the main line so as to locate the valve as close as possible to area that is under its control.

C Install valve boxes so that they do not rest on the pipe, the cover does not conflict with the valve stem and so that they are flush with the ground surface.

3.12 SPRINKLER INSTALLATION

A On flat landscaped areas, install sprinklers plumb. In areas where they are installed on slopes, sprinklers shall be tilted as required to prevent erosion.

B Adjust sprinklers should be adjusted to avoid unnecessary discharge on pavements and structures. Adjust sprinklers so they don't water on roads.

C Provide a minimum separation of 4 inches between sprinklers and pavement. Provide a minimum separation of 12 inches between sprinklers and buildings and other vertical structures.

D Piping must be thoroughly flushed before installation of sprinkler nozzles. Surface mounted and pop-up heads shall be installed on swing joints, flexible pipe, or polyethylene (PE) nipples. Above ground (riser mounted) sprinklers shall be mounted on Schedule 40 PVC or steel pipe and be effectively stabilized.

3.13 SPECIFIC CONDITIONS

A Verify the static water pressure at the time that irrigation system will be operating. Minimum acceptable static pressure is 55 PSI for correct system operation. Provide booster pump if pressure is below this point.

3.14 LOW VOLTAGE WIRE INSTALLATIONCLEANING

A Install low voltage wire (30 volts or less) with a minimum of 12" of cover.

B Install wire that is UL listed for direct burial.

C Provide wire connectors that are approved for direct burial use.

D Provide a sufficient length of wire at each connection to allow for thermal expansion/shrinkage. As a minimum, provide a 12-inch diameter loop at all splices and connections.

E Install all above ground wire runs and wire entries into buildings in electrical conduit.

F Provide common wires with a different color than the power wires (white for common wires).

3.15 INSPECTIONS

A Periodic inspections will be performed throughout the duration of the installation. These inspections will be made by the Owner's representative and Contractor to insure that the installation is in compliance with the design intent, specifications, and these standards. Inspections will be made on the following items:

1. Sprinkler Layout and Spacing: This inspection will verify that the irrigation system design is accurately installed in the field. It will also provide for alteration or modification of the system to meet field conditions. To pass this inspection, sprinkler/emitter spacing should be within a =5% of he design spacing.

2. Pipe Installation Depth: All pipe in the system shall be installed to depths as previously described in this standard.

3. Cross Connection Control -

   a) Public or Domestic Water System: Check that an approved backflow prevention device is properly installed and functioning correctly. Check the location of the device is not creating a hazard to pedestrians or vehicular traffic.

   b) Water Systems Other Than Public or Domestic Water Systems: Check that backflow prevention devices are provided if chemicals will be injected into the irrigation system.

B Inspection Log: An inspection log shall be kept at the job site. This log will show signatures and dates with description of inspections performed. This log may be required to be submitted to the governing agency upon their request.

3.16 LEAKAGE TESTING

A All mainlines upstream from the zone valves will be tested in one of two ways:

1. Visual: 25% of all the joints shall be left exposed and inspected while under pressure equal to the pipe pressure rating. No visible leakage will be allowed. If any leaks are detected, then a hydrostatic test must be performed. All visible leaks must be corrected.

2. Hydrostatic: The following formula will be used to determine maximum allowable limits.

   DUCTILE IRON: $L=S\ P / 133{,}000$

   PVC GASKETED JOINT: $L=N\ D\ P / 7{,}400$

Where:

L = allowable leakage (gallons/hour)

N = number of joints

D = nominal diameter of pipe (inches)

P = average test pressure (pounds per square inch)

S = length of pipe (feet)

B PVC solvent welded pipe connections shall have no leakage. Polyethylene control tubing lines shall have no leakage.

C When testing a system which contains metal-seated valves, and additional leakage per closed valve of 0.078 gallons/hour/inch of nominal valve size is allowed.

3.17 SPRINKLER COVERGE TESTING

A All sprinklers must be adjusted to minimize over-spray onto buildings and paved areas.

B All planted areas must receive water directly applied by the sprinklers.

C All sprinklers must operate at their design radius of throw.

D Spray patterns must overlap as designed.

E Verify that the sprinklers are connected to the appropriate zone.

F Verify that nozzle sizes and types called for in the system design have been used.

3.18 PRESSURE DISTRIBUTION TESTING

A Pressure Head Loss Tests: The design operating pressure of the system shall be as stated on the Drawings. The pressure distribution throughout each block shall be not more than plus or minus 10% of the design operating pressure.

B Perform testing as follows:

1. Zones to be tested shall include at least the largest zone, smallest zone, the zone closest to the source in terms of mainline distance, and the zone farthest from the source in terms of mainline distance.

2. Test each zone by measuring pressure at a minimum of two points. One pressure shall be measured at the sprinkler closest to the zone control valve and another at the sprinkler farthest from the control valve.

3. Observe the system operating through one complete cycle (with abbreviated irrigation periods) of the control system.

END OF SECTION END OF SECTION 02810

SECTION 02900

LANDSCAPING

PART 1 - GENERAL

1.1 SUMMARY OF WORK

A The work under this Section of the Specifications consists of furnishing all plants and related materials (including fertilizer, organic matter, herbicide, mulch, and topsoil), supervision, labor, equipment, appliances, and services necessary for and incidental to completing all operations in connection with the planting of trees, shrubs, ground covers, and other such materials in strict accordance with these Specifications and the applicable Drawings. In general, the Work shall include, but not be limited to, the following.

1 Removal and disposal of existing plant material not indicated on Drawings.
2 Excavation as required for all planting and backfilling tree pits.
3 Furnishing, transporting, preparing, and placing of prepared topsoil for plant beds.
4 Bed preparation.
5 Furnishing and planting of trees, shrubs, and ground covers as indicated on Drawings.
6 Staking trees.
7 Samples and analyses for approval.
8 Maintenance until substantial completion of Project.
9 Replacement of unsatisfactory plant material.

1.2 SUBMITTALS

A Provide submittals as required and outlined below under "PART 2 - PRODUCTS" and Paragraph 3.5 "SAMPLES, TESTS, AND INSPECTIONS."

1.3 APPLICABLE STANDARDS

A Work shall be in strict accordance with sound nursery practice. The following documents, used as standards, are to considered part of these Specifications.

1 American Standard for Nursery Stock, latest edition, as published by the American association of Nurserymen, Inc.
2 Standardized Plant Names, latest edition, as adopted by the American-Joint committee on Horticultural Nomenclature.
3 Grades and Standards for Landscape Materials, latest edition, as prepared by the Louisiana Association of Nurserymen, Inc.

1.4 SPECIAL LANDSCAPE PROVISIONS

A Definition: The term "Contractor" as referred to in this Section only means the Landscape Contractor. The Landscape Contractor shall be currently licensed by the Louisiana Horticulture Commission to do landscape contraction work in the State of Louisiana.

B Water: It is the Contractors responsibility to insure proper scheduling and quantity of watering of all plant material.

C Finished Grading: It shall be the Contractor's responsibility to do whatever additional fine grading as may be required to bring areas to be planted back up to the existing finished grades or to grades specified on the Drawings or these Specifications. This shall also apply to existing slopes, or lawn areas damaged during the Work herein and the contractor shall replace or repair any such existing area to return it to its original grade or condition.

D Period of Establishment and Replacement:

1 Upon the completion of planting, and providing plants are in place, living and conform to these Specifications., this portion of the Contract will be given substantial completion.

2 The Contractor shall be responsible for replacing dead, damaged, or unhealthy plant materials and in general insuring proper plant growth for a Period of Establishment, which shall be one year after substantial completion.

3 Plant materials which have partially died so that the shape, size , or symmetry has been damaged, shall be considered subject to replacement. In such case, the opinion of the architect shall be final.

4 Plants used for replacement shall be of the same quantity, size, kind, and quality as those originally planted, and shall be planted as originally specified. This extra work, including materials, labor, and equipment used in replacements, shall be at no cost to the Owner. Replaced plants shall carry the same establishment period as the original. Damage, including ruts in lawn or bed areas, existing utilities, paving and other improvements, incurred in making replacements shall be immediately repaired to the satisfaction of the Owner

5 At the direction of the Architect, plants may be replaced at the start of the next year's planting or digging season, but in such cases, dead plants shall be removed from the premises immediately.

6 The Contractor agrees that until substantial completion of the Project, he will maintain all plant materials and bed areas in a reasonable condition.

7 This replacement guarantee does not apply where plants die after provisional acceptance and before final acceptance because of injury by storm, hail, or vandalism.

8 Final acceptance will be made only if all plants are in place, living, and are in conformance with the Drawings and these special provisions.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A General: Plants shall be well-formed No. 1 grade or better nursery stock and shall meet the applicable standards noted herein for nursery stock and shall be subject to rejection by the Architect. Plants shall remain the property of the Contractor until final acceptance.

B Plant List: A plant list is shown on the Drawings.

C Nomenclature: The scientific and common names of plants herein specified conform with the approved names given in "Standardized Plant Names." Names of varieties not included therein conform generally with names accepted in the nursery trade.

D Inspection/Rejection: The Owner or Architect may inspect plants at place of growth, but such inspection does not preclude the right of rejection on site. Any materials may be rejected if, in the opinion of the Architect, such does not meet the requirements of the Plant List, Drawings, or Specifications. Rejected materials shall be removed from the site by the Contractor at no cost to the Owner.

E Quantities: Quantities necessary to complete the plantings as shown and located on the Drawing shall be furnished. Dimensions for planting beds have, in all instances, been established from scaled Drawings. It is the Contractor's responsibility to check these dimensions on the site and allow for correct quantity of plants accordingly.

F Quality and Size:

1 Specific requirements concerning the various species, sizes, and manner in which they are to be furnished are shown on the Plans and Plant List.

2 Plants and trees shall equal or exceed the measurements specified in the Plant List, which are minimum acceptable sizes. They shall be measured before pruning, with branches in normal position. Dimensions for height and spread as contained herein refer to the main body of the plant and not from branch tip to branch tip. No pruning of branches to obtain the required height shall be done before the plants are delivered to the site unless so approved by the Architect.

3 Stock furnished in a size range specified shall be interpreted to mean hat not less than fifty percent (50%) shall be of the maximum size specified.

4 The determining measurements for the trees shall be the caliper or/and height as described in the Plant List. Caliper shall be taken six inches (6") above the ground when the tree is in the natural position.

5 Plants larger in size than specified in the Plant List may e used if approved by the Owner, but the use of larger plants shall not increase the Contract price. If the use of larger plants us approved, the ball if earth shall be increased in proportion to the size of the plant.

6 Plants shall have a habit of growth which is normal for the species and shall be sound, healthy, vigorous, and free from insect pest, plant diseases, injuries, and after-effects thereof.

7 Nursery grown plants shall mean plants which are healthy, vigorous plants, lined out in rows in a nursery and which are cultivated, sprayed, pruned and fertilized in accordance with good horticulture practice.

8 No trees which have had their leaders cut, or have been damaged so that cutting is necessary, will be accepted.

9 Plants lacking compactness or proper proportion and plants injured by too close planting in nursery rows will not be accepted.

10 Plants shall be freshly dug or containerized; neither heeled-in plants nor plants from cold storage will be accepted. Nursery grown plants shall have been transplanted or root pruned at least once in the past three years.

11 Plants designated "B&B" in the Plant List shall be balled and burlapped. Requirements for measurement, branching, grading, quality, balling and burlapping of the pants generally follow the code of standards in the "American Standard of Nursery Stock."

12 The balls of "B&B" plants which cannot be planted immediately on delivery shall be covered with moist soil or mulch, or other protection from drying winds and sun. Bare rooted plants will not be allowed. Plants shall be watered as necessary by the Contractor until planting.

13 Plants grown in containers shall be fully rooted throughout the earth ball within the container, but not root bound. Container plants must be acclimated to area conditions.

G Shape and Form:

1 Plant material shall be symmetrical, typical for the variety and species. And shall conform to the measurements specified in the Plant List. Plants used where symmetry is required shall be matched as nearly as possible.

2 Plants meeting the requirements specified in the Plant List, but not possessing a normal balance between height and spread will be rejected.

3 No plant shall be bound with wire or rope at any time so as to damage the bark or break the branches. After planting, wires and ropes shall be removed.

H Substitutions: Will not be permitted without approval of Architect. If proof is submitted that nay pant specified is not reasonably obtainable, a proposal will be considered for the use of the nearest equivalent size or variety with an equitable adjustment of Contract price.

2.2 SOIL PREPARATION MATERIAL

A Planting Soil: Free of extraneous matter and weeds and shall be a mixture of composted organic matter, fine screened pine bark, rice hulls, pump sand, and sharp sand. The soil pH range shall be 5.5 - 6.5. all materials shall be thoroughly mixed prior to delivery to the site. The planting soil shall be provided by Nu-Earth Organics Co., New Orleans, LA (361-4769) or approved equal.

B Fertilizer: Tree and shrub 'AGRIFORM' controlled release fertilize tablets (20-10-5 / 21 gram). Ground cover & annuals shall use 'SIERRA' controlled release fertilizer tablets (16-8-12 / 7.5

gram). Any fertilizer which becomes wet, caked, or otherwise damaged, making it unsuitable for use, will not be accepted.

C Pine Needle Mulch: Shredded pine straw needles, clean of any debris or extraneous matter. It shall be delivered to the site in sealed plastic bags. Pine straw mulch is available through Southern Straw Company, Poplarville, MS, (601) 795-2581. Contractor shall furnish the Architect with one bag of mulch for approval prior to placing.

D Pre-Emergent Herbicide: Dow Elanco 'Snapshot 2.5 TG' preventable weed control or approved equal. Herbicide shall be delivered to the site in sealed, unopened containers.

E Top dressing for Sod & Berms (if applicable): Clean, weed free pump sand obtained from a Mississippi River Batture.

2.3 ACCESSORY MATERIALS

A Staking::

1 Stakes: Uniform 2 inch x 2 inch (2" x 2") wood stick, painted black, pointed at one end, of sufficient length to maintain stability of planted trees. Use three (3) stakes per tree and install per detail on Drawings.
2 Guying Material: No. 12 gauge galvanized iron or steel, 6 strand wire.
3 Hose: To serve as insulation for guying material, hose shall be in suitable lengths of two ply rubber or fiber-bearing garden hose, not less than ½ inch inside diameter. Hose used shall be consistent in color, size, and material throughout the site.
4 Steel Edging: 1/8 inch thick x 4 inches deep green painted steel edging. Each separate edging strip shall be secured by steel spikes to match edging. Install between all planting beds and lawn areas.

PART 3 - EXECUTION

3.1 GENERAL

A Cooperate with other contractors and trades working in and adjacent to the landscape work areas. No portion of the work specified in this Section shall proceed in areas where work of other crafts or contractors is to occur until that work has been completed or until authorized to do so by the Architect.

B Proceed with and complete the landscaping work as rapidly as portions of the site become available.

C Determine location of underground utilities or other obstructions. Hand excavate, as required, to minimize possibility of damage.

D Maintain grade stales, forms, or work done by others until removal is mutually agreed upon by all parties concerned.

E No plant materials shall be delivered until site conditions are ready for planting.

3.2 DIGGING, PREPARATION, AND HANDLING

A Digging Balled Plants: Plants designated "B&B", (Balled and Burlapped), in the Plant List shall be adequately balled with firm, natural balls wrapped in burlap. Balls shall be lifted from the bottom only, not by stems or trunks. Retain as many fibrous roots as possible. No "B&B" plant shall be shipped or planted if the ball is cracked or broken, or dug while wet.

B Container Grown Plants: Plants designated in various size and type containers in the Plant List shall be of a reasonable age and state of development as specified herein under "PLANT MATERIAL" and shall be staked carefully during shipment to avoid damage. Plants dislodged from containers or dropped in shipment will be rejected.

C Preparation: Prepare plants for shipment in a manner that will prevent any damage to the branches, shape or future development of the plants. The Contractor shall, in loading, unloading, or handling plants, exercise the utmost care to prevent injuries to trunks, limbs, branches, and roots.

D Protection: Plants shall be handled in such a manner as to avoid unnecessary damages of any kind. Handle plants so that roots, stems, and branches are adequately protected at all times from drying out before and during the planting process. If not immediately planted upon delivery, the balls of balled plants shall be covered with moist soil or mulch, or other protection to keep roots moist. Locate these and container plants located in flats, pots, or other containers in a sheltered area protected from the sun, wind, and mechanical damage. Plants shall be watered as necessary until planted.

E Shipment and Delivery:

1. When shipment is made by truck, plant material shall be packed to provide adequate protection against climatic and breakage injuries during transit. The tops shall be securely covered to minimize wind whipping and drying.
2. A suitable method of handling shall be employed to ensure the careful, workman-like delivery of balled plants to preclude cracked or "mushroomed" plant balls at the point of delivery. Under no circumstances shall balled plants be dropped from trucks to the ground.
3. The Contractor shall notify the Architect or his representative in advance of the time and manner of delivery of plants, and shall furnish an itemized list in duplicate of the actual quantity of plant materials in each delivery in order to expedite the required inspection a t point of delivery. The itemized list shall include the pertinent data in the form as specified in the Plant List.

3.3 PLANTING AND BED PREPARATION

A General:

1. Time and Planting: Planting operations shall be conducted under favorable weather conditions during the seasons which are normal for such work as determined by accepted practice in the locality. At the option of and on the full responsibility of the Contractor,

planting operations may be conducted under unseasonable conditions without additional compensation to the Contractor for damage to plants as a result of extreme temperatures.

2. Plant Material Locations: The drawings are diagrammatic, the exact locations shall be approved by the Architect. Shade and ornamental trees shall be laid out and located with stakes according to the plan. Shrubs, and ground cover shall be positioned on prepared bed areas as shown on the drawings in their original containers. After quantity, staking and spacing has been adjusted and approved by the Architect, plant where located.

3. Obstructions or Unsuitable Conditions Below Grade: Any rock over ¾" diameter, concrete or other underground obstruction or unsuitable planting soil shall be removed to the depth necessary to permit proper planting according to Drawings and Specifications If underground construction, utilities, unusually large rock, other serious obstructions or unsuitable soil conditions are encountered in planting areas, other locations for the planting may be selected the Architect.

B Excavation for Planting:

1 Pits: Circular in outline with vertical, scarified sides. Mechanical digging of pits may be approved by the Architect. Pits shall be at least one foot (1') foot greater in diameter than the diameter of the ball. Pits for trees shall be of sufficient depth to allow trees to be set to grade. Pits for shrubs and other plants shall be of sufficient depth to allow a six inch (6") layer of planting soil under the ball when they are set to grade.

2 Planting Beds: Strip of any grass and weeds and excavate shrub beds as necessary to remove all roots, debris, shell, and unsuitable conditions for planting.

C Bed Preparation: Preparation of the top 12 inches (12") of planting soil shall be prepared as follows:

1 General: All undesirable vegetation in areas to be planted shall be sprayed with 'Roundup' Herbicide two weeks prior to scheduled bed preparation. Before the start of any bed preparation, all areas to be prepared shall be stripped of any grass, weeds, etc. to a minimum depth of one inch (1") or as necessary to remove all roots. All plant material existing on the site which are not indicated on the planting plan are to be removed and hauled from the site. Removal shall include all roots, with the exception of any trees with a trunk diameter (when measured in excess of six inches (6"), six 6 inches (6") above grade) in which case the stump may be ground and/or roots removed as necessary to accommodate a growing medium in which new material can thrive.

2 Fine grade to remove all trash, rocks, debris, etc. and till to a six inch (6") depth.

3 Spread six inches (6") of planting soil uniformly over entire planting areas. However, within the drop line of any existing trees to remain, planting soil shall be reduced to a maximum two inches (2") depth above previously existing grade.

4 Rotor till or mix by other method approved by the Architect to a depth of twelve inches (12") until amendments are thoroughly mixed and mixture has fine texture and loose expanded appearance. Within the dripline of existing trees to remain, tilling shall be done by hand with shovels and care shall be taken not to damage roots.

5 Re-grade to the finished grade before planting.

6 Ground covers that have a spacing of plants that is 12 inches (12") or less may be top dressed with mulch before planting.

7 Once planting is completed, apply an even application of 'Snapshot 2.5 TG' herbicide at the rate of four point six (4.6) pounds per one thousand (1,000) square feet plus three inches (3") top dressing of pine straw.

D Planting Pits for Trees and Shrubs:

1 The Landscape Contractor shall review the applicable Architectural and Engineering Drawings, and be familiar with the alignment of underground utilities and improvements before any excavation work is begun. THE CONRACTOR IS TO BE FULLY RESPONSIBLE FOR ALL DAMAGES TO UNDERGROUND UTILITIES AND IMPROVEMENTS. Pits shall be dug as shown in planting details.

E Setting Plants:

1 Shrubs and Ground Covers: All plants except as otherwise specified, shall be centered in pits. Deep planting shall be avoided and unless otherwise specified or directed, all plants shall be set at such a level that after settlement they will bear the same relation to the required grade as they have to the natural grade before being transplanted . Make adjustment of position of plants where necessary and prior to complete planting as directed by the Landscape Architect. Compact topsoil mixture, as specified, around balls or roots the full diameter of plant pit and water thoroughly.

2 Trees: Plant in pits. The depth of the pits shall be as deep as necessary to accommodate the ball or roots when the plant is set to the required grade. Backfill with planting soil mixture as specified and thoroughly settle by tamping and watering. Fertilize with specified material at manufacturer's recommended rate. All plants shall stand, after settlement, at the same level at which they have grown. Care should be taken in setting plants plumb.

F Saucering: At the time of planting, after planting soil has been placed, an earth saucer shall be made for the retention of water around each tree. The saucer shall be of the same diameter as that of the hole dug. The lip shall be level all around and shall be at least four inches (4") high for trees.

G Mulching: Upon completion of the planting, tree, shrubs and bed areas shall be mulched with a three inch (3") layer of pine needles entirely covering the area around each plant. In case of bed areas, the area between the plants is to be so treated regardless of plant spacing, and trees shall be mulched entirely covering the tree pit area within the saucer.

3.4 PRUNING AND STAKING

A Pruning:

1 Each tree shall be pruned by an experienced plantsman to preserve the natural shape and character of the tree immediately upon acceptance by the Architect. Method of pruning shall be demonstrated for Architect's approval before beginning pruning process.

2 Prune any broken branches, thin small branches, soft wood, or sucker growth, and tip back main branches (except main leaders). Additional pruning may be required by Architect after planting is completed.

3 Pruning cuts shall be sharp and clean.

B Staking:

1 Trees over one inch (1") caliper shall be securely staked immediately after planting using method indicated on Drawings.
2 Use three two inch x two inch (2" x 2") painted black wood stakes per tree.
3 Secure trees to stakes using guying material run through garden hose for insulation between wire and tree. No wire shall be allowed to touch the bark of trees.

3.5 SAMPLES, TESTS, AND INSPECTIONS

A Submit samples called for in these Specifications. These samples, if approved shall be maintained as representative examples for future use of these materials.

B The Contractor shall be responsible for certificates of inspection of plant materials that may be required by federal, state, or other authorities to accompany shipments of plants. Inspection of plants to be balled and burlapped may be made at the place of growth by the Architect. Plants may be inspected and approved before they are planted. Inspection and approval by Architect of plants at the place of growth or upon delivery shall be of quality, size and vitality only, and shall not in any way impair the right of rejection for failure to meet other requirements during progress of work.

C Analyses and test of materials, if required, such as fertilizers, mulch, herbicides, and planting soil shall be made in accordance with the current methods of the Association of Official Agricultural Chemists and shall be made at the Contractor's expense before delivery to the site. Packaged and sealed standard products accompanied by manufacturer's or vendor's analyses complying with specified requirements, will be acceptable.

D The contractor, at his own expense, if required by the Architect, shall have the topsoil analyzed to determine the type of fertilizer required and rates of application of fertilizer. The analyses shall be made by an approved laboratory or government agency using samples taken and submitted by the Contractor according to laboratory or agency instructions. The samples tested shall consist of a representative mixture from each source.

E Approval of materials shall not be construed as final acceptance and the Architect reserve the right to analyze, for comparison with Specification requirements, any materials delivered for use in work under this Section. The cost of such tests will be borne by the Owner. Should these tests indicate non-compliance with Specification requirements, the Owner will charge the entire costs of such tests to the contractor. Rejected materials shall be removed from the site and replaced with acceptable material.

3.6 CLEAN-UP

A As planting operations proceed, rope, wire, burlap, empty containers, rocks, clods, and other debris left by the contractor shall be REMOVED DAILY and not allowed to accumulate, and the site shall be kept as tidy as possible at all times. Excess excavated topsoil or rich loam shall be placed where and as directed by Owner and General Contractor. After planting operations

are finished, paved areas which have become dirty or strewn with other materials shall be thoroughly cleaned by sweeping and washing.

3.7 MAINTENANCE

A Maintenance During Planting: All plants shall be watered, pruned, sprayed, fertilized, cultivated, and otherwise maintained and protected until substantial completion of Project. Defective work shall be corrected as soon as possible after it becomes apparent and weather and season permit. Upon completion of planting and prior to acceptance, the planting contractor shall remove from planting operations.

B All planting shall be continuously maintained. Maintenance shall begin immediately following the accomplishment of any unit of planting operation and shall continue until substantial completion of Project.

C Maintenance of Planting: Plantings shall be adequately maintained according to the best horticultural practice. Maintenance shall include watering, weeding, fertilizing, spraying, dusting, cultivating, mulching, pruning, edging, prompt removal and replacement of dead and sickly plants, re-setting of plants to proper grade or upright position, restoration of planting saucer, and any other necessary maintenance operations.

D Maintenance Program: The Contractor shall prepare and deliver to the Owner a recommended Maintenance Program for the lawns and planted areas.

3.8 FINAL INSPECTION AND ACCEPTANCE

A Inspection of the work for substantial completion and beginning the Period of Establishment (See 1.4 "SPECIAL LANDSCAPE PROVISIONS") will be made by the Architect upon written notice by the Contractor requesting such inspection provided all plants are in place, living, and conform to these Specifications. Notify the Architect at least ten (10) days prior to the anticipated date when the work is to be completed.

B After inspection, if the work is acceptable, the Contractor will be notified in writing by the Architect of substantial completion and the beginning of the Period of Establishment. The Contractor will also be notified of any deficiencies in the requirements for receiving substantial completion. Work remaining to be done shall be subject to re-inspection before acceptance.

C Corrections and replacements for final acceptance will be made only under the conditions of "Period of Establishment and Replacements" under 1.4 "SPECIAL LANDSCAPE PROVISIONS". Contractor will be notified in writing by the Architect of any deficiencies of the requirements for completion of the work prior to the end of the Period of Establishment or of Final Acceptance of the Work.

END OF SECTION 02900

SECTION 02930

LAWN

PART 1 - GENERAL

1.1 SUMMARY

A The work under this Summary consists of furnishing all fertilizer, sod, seed, and related materials, supervision, labor, equipment, appliances, and services necessary for and incidental to completing all operations in connection with the dressing, sodding, and seeding earthwork areas in strict accordance with these Specifications and applicable Drawings. Contractor shall inspect drawings and site for quantity and shall insure that his bed includes sod necessary to fully cover all areas indicated as sod on the Drawings. Quantity indicated in schedule on Drawings may be used for reference. In general, the work shall include, but is not limited to, the following:

1 Dressing and sodding areas as noted on drawings.
2 Maintenance until substantial completion of Project.

1.2 WARRANTY

A Contractor shall insure a viable, uniform dense stand of grass within the lawn areas, by use of methods specified herein, until final acceptance of Project or for a one-year period.

PART 2 - PRODUCTS

2.1 FERTILIZER

A Provide a complete commercial lawn starter fertilizer conforming to all applicable State fertilizer laws. Fertilizer shall be delivered in original, unopened containers each bearing the manufacturer's guaranteed analysis, and shall be uniform in composition, dry and free flowing. Any fertilizer which becomes wet, caked, or otherwise damaged making it unsuitable for use will not be accepted.

2.2 GRASS SOD

A Centipede Sod (Eremochloa Ophiuroides): Live, at least two (2) years old, well rooted, free of weeds and nutgrass, and shall be cut with a full ¾" of natural soil covering the roots. It shall be delivered to the site in twelve inch (12") wide strips and shall not have been stacked for more than 24 hours between the time of cutting and delivery to the job site. During delivery, prior to and during the planting of the lawn areas, the sod panels shall at all times be protected from excessive drying and exposure of roots to the sun.

2.3 TOP DRESSING

A Top dressing shall be clean, weed-free pump sand obtained from a Mississippi River batture.

PART 3 - EXECUTION

3.1 SODDING

A All undesirable vegetation in areas to be sodded shall be sprayed with 'Round-up' herbicide two weeks prior to scheduled installation of grass sod. Roundup shall be mixed per manufacturer's label recommendations and care shall be taken not to allow contact with the foliage of trees to remain on the site.

B Loosen or scarify soil to a depth of two (2) to four (4) inches using a tractor disc or other approved method. Areas to be sodded shall be cleared of any weeds, sticks or other debris; then dress out entire area with top-dressing material, and grade out eroded areas and unreasonable roughness in the surface.

C Broadcast fertilizer evenly at manufacturer's specified rates, by mechanical spreader over all areas to be sodded and work into surface by lightly harrowing.

D Prior to sodding, the finished surface shall be smooth, finely textured and conform to the lines and grades shown on the Drawings or as directed by the Architect.

E Upon delivery, slab sod shall be transferred onto the surface of the soil with sod panels tightly together to make a solid-sodded lawn area. Immediately following the sod laying, the lawn areas shall be thoroughly watered and rolled with a lawn roller commonly used for such purposes.

F Inspection of the work to determine substantial completion will be made by the Architect. No grass will be accepted unless it is alive and healthy.

3.2 CLEAN UP

A Thoroughly clean the entire Project area of all trash and other debris and all unused or salvaged materials resulting from sodding operations. After completion of the work, remove all spoil piles and sweep or rake the entire Project area clean.

3.3 MAINTENANCE AND PROTECTION

A Maintenance shall consist of watering as required and any other work incidental to the health of the turf. When grass obtains a height of three inches (3"), it shall be mowed to a height of two inches (2"). The maintenance period shall continue until substantial completion of the Project.

B If the surface to be sodded becomes gullied or otherwise damaged or repair work is required due to faulty operations or negligence on the part of the Contractor, repair work shall be performed at no additional cost to the owner.

FOR INFORMATION ONLY

C Inspection and Acceptance: Final acceptance will be made on completion of a one year Period of Establishment from the date of substantial completion. Acceptance of the established turf will be determined by the visual inspection. Existence of erosion problems or dead and drying sod will not be acceptable. A healthy growing turf is expected.

END OF SECTION 02930