

32 80 00 IRRIGATION

A. Overview

1. Damage to existing irrigation systems must be repaired within 24 hours. If not repaired in this period, the costs of the repair will be charged to the project.

B. Materials

1. Automatic Controllers

- a. The location of the controller shall be approved by SHSU Landscape Services.
- b. All irrigation controllers shall be a Calsense ET2000e LR, RRe, -F, with TP boards and radio frequency of 452.6875.

2. Electric Control Valves

- a. Only Toro and Hunter valves shall be installed.

3. Quick Coupling Valve

- a. Quick coupling valves shall have brass two-piece bodies designed for pressures of 150 P.S.I. with a $\frac{3}{4}$ " diameter.

4. Control Valve Boxes

- a. Install all valve boxes at grade level.
- b. Install a 10" round box for all ball valves.
- c. 12x17 valve boxes shall be used for valves smaller than 2".
- d. 17x30 boxes shall be used for valves larger than 2".
- e. Valve cover boxes shall have locking covers with the following colors: purple for non-potable, black in mulched beds and green in turf areas.

5. Wiring

- a. All wiring in-between the automatic controllers and the electric valves shall be #14 direct bury copper wire AWG-U.F. 30 volt.
- b. Common wires shall be white with different colors for each controller.
- c. Bury one additional wire from each controller to the farthest valve in each direction. This wire shall be different color from the other controller and common wires.
- d. The wiring shall be buried in the same trench as the supply or lateral lines when possible.
- e. When one or more wires are placed in a trench the wiring will be taped together every 10'.
- f. Control wire splices shall be with 3M-DBY or equivalent direct bury splice kits.
- g. Each valve shall have an individual wire to the controller. Connecting multiple valves on a single wire is not permitted.

6. Heads and Nozzles

- a. All nozzles shall be the same size, type and apply the same rate and spread of water as indicated in the landscape plans.

- b. Spray nozzles shall have a screw adjustment.
 - c. Fabricate all risers as shown in the plans.
 - d. Riser nipples for all irrigation heads shall be the same size as the riser opening in the head.
 - e. All irrigation heads of the same type shall be the same manufacturer.
 - f. Install all irrigation heads on a swinging joint.
- 7. Flow Sensors
 - a. All flow sensors shall be Calsense Flow Meters.
 - b. The size of the flow sensor shall be based off the highest and lowest flow zones. The size is not based on the size of the mainline.
- 8. Drip Irrigation
 - a. No drip irrigation shall be installed on the SHSU campus.
- 9. Copper Piping
 - a. Any irrigation piping inside of a building shall be copper pipe that is labeled "IRRIGATION".
- 10. Backflow Prevention Units
 - a. All irrigation systems shall have a backflow preventer than meets the requirements of AWWA C506 and the City of Huntsville.
 - b. The backflow units shall be the types and size indicated on the landscape plans.
 - c. Double check backflow units shall not be installed as per the City of Huntsville.
 - d. Install all backflow units above ground and located to minimize visibility.
 - e. Each backflow unit will be provided with an insulated cover.
- C. Installation
 - 1. Trenching
 - a. Pressure supply lines shall be buried to a minimum depth of 18".
 - b. Non-pressure lines shall be buried to a minimum depth of 6".
 - c. All wiring shall be buried to a minimum depth of 18".
 - 2. Sleeves
 - a. Pipe and wiring beneath sidewalks, driveways or concrete areas shall be inside a sleeve.
 - b. The sleeve shall extend 24" beyond the surface obstacle.
 - c. The sleeve shall be twice the diameter of the pipe running through it.
 - d. An extra 2" capped sleeve shall be installed under any sidewalks, driveways or concrete areas.
 - e. The sleeve shall be marked with a 3" brass bolt embedded on each end of the concrete surface.
 - f. All sleeve pipe shall be PVC Schedule 40 with solvent weld joints.

32 0 00 PLANTING

I. General Overview

- A. Planning
 - 1. SHSU Landscape Services will be involved in the planning process for any campus landscape.
 - 2. All outside landscape planners and architects shall visit and observe the SHSU campus prior to any design.
- B. Final Grading
 - 1. Terrace any slopes greater than 30% or build a retaining.
- C. Soil
 - 1. Conduct multiple soil tests at each site to determine the following soil characteristics:
 - a. Plasticity Index
 - b. Soil pH
 - c. Soil Texture
 - d. % Organic Matter
 - e. All Macro and Micro Nutrients
 - f. Percolation Rate
 - g. Conductivity
 - 2. Planting area soil backfill shall be a mixture of $\frac{3}{4}$ sandy loam and $\frac{1}{4}$ compost.
- D. Chemicals and Fertilizers
 - 1. SHSU Landscape Services must approve insecticides and herbicides before application. Submit accurate records to SHSU Landscape Services containing target organism, rate, method, applicators license number and name.
- E. Plant Materials
 - 1. All plant materials installed on campus will be subject to inspection by SHSU Landscape Services. Detailed plant material standards are in the sections for turf, ornamental planting and trees. Any plant material not complying with these standards will be rejected.
- F. Mulch
 - 1. The recommended mulch for campus is coarse shredded/chipped woody materials and pine straw.
 - 2. 2" is the minimum allowed mulch thickness.

II. Turf

A. Materials

1. Acceptable Sod Types
 - a. St. Augustine is the primary sod for the SHSU campus.
 - b. Bermuda grass shall be installed on fields and non-irrigated areas.
 - c. Sod shall be of certified stock.
2. Sod shall be uniformly mowed at a min. of 1.5" and a max. of 2.5".

B. Installation

1. Lay sod on slopes greater than 33% perpendicular to the slope and hold in place with staples or other approved fasteners.

III. Ornamental Plants

A. Site Preparation

1. Weed Control
 - a. No weed barriers/cloth shall be used.
2. Soil
 - a. Till six inches of pH balanced compost and any needed soil amendments into all planting areas.
3. Grading
 - a. Soil graded towards curbing/edging must have a maximum 25% slope.

IV. Trees

A. Overview

1. Use this document and the SHSU Campus Tree Care Plan in conjunction for managing all campus trees.

B. Tree Protection

1. Project Site Tree Assessment
 - a. The SHSU Arborist shall be provided with a detailed map of all proposed project activities on the site.
 - b. The SHSU Arborist will identify every tree with the potential to be impacted by the project activities.
 - c. The SHSU Arborist and other project stakeholders will determine which trees on the project site will be protected or removed.
 - d. Protected trees shall be indicated on the project plans.
 - e. Assume that every campus tree is protected under the tree protection guidelines until notified.

2. Critical Root Zones (CRZ)
 - a. Each protected tree on a project site will have a CRZ that extends 1' radially from the center of the tree trunk for every inch of tree diameter at 4.5' (DBH). For example, a tree with a 10" DBH would have CRZ that extends 10' radially in all directions from the tree trunk.
 - b. The minimum CRZ for any campus tree is 6' from the trunk.
 - c. The SHSU Arborist will determine each CRZ.
 3. Tree Protection Zones (TPZ)
 - a. The TPZ for each tree will be created inside the tree CRZ
 - b. Preserve at least 50% of the tree CRZ.
 - c. No cuts or fill greater than 4" inside a $\frac{1}{2}$ CRZ distance from the tree trunk.
 - d. No cuts or fills inside a $\frac{1}{4}$ CRZ distance from the tree trunk.
 - e. Place 4" of coarse organic mulch inside every TPZ.
 - f. All tree limbs and foliage extending outside the TPZ shall be protected from injury.
 - g. The SHSU Arborist will determine each TPZ.
 - h. After it is established, no activities can take place inside a TPZ. No one and nothing is allowed to enter the TPZ without first contacting and gaining permission from the SHSU Arborist.
 4. Fencing
 - a. Surround all TPZ with temporary metal fencing at least 4' high with approved tree protection signs in English and Spanish.
 - b. The fencing shall be installed before construction starts and will remain until the project is completed.
 - c. The TPZ fencing cannot be altered or entered without contacting and gaining permission from the SHSU Arborist.
 5. Inspections and Maintenance
 - a. Any protected tree on the site will be subject to inspections by the SHSU Arborist.
 - b. Any issues found may cause a change in tree protection requirements.
 - c. Each protected tree shall be maintained to ensure that enough water and nutrients are available. This may require an available water source.
- C. Excavation and Tree Roots
1. Excavation
 - a. The SHSU Arborist will oversee any excavation in a tree CRZ.
 - b. Air excavation techniques are the recommended method for removing soil inside a tree CRZ.
 - c. No open trenching can take place inside a tree CRZ. If unavoidable, tree roots 2" and greater must be dug around, wrapped and moistened.
 - d. Boring at a depth of 18" can be conducted under a tree CRZ.

2. Root Pruning
 - a. Any root 2" or greater found during excavations shall be pruned flush with the soil.
 - b. Rebury exposed roots within 24 hours. If they cannot then they shall be covered and moistened to prevent dieback.
- D. Tree Selection
 1. Species Selection
 - a. Select tree species based on their suitability for the site and the objectives for planting the tree.
 - b. Prioritize trees native to Texas and the East Texas region.
 - c. Apply the 30-20-10 rule to all tree species selections.
 2. Tree Location
 - a. All tree spacing shall enable the tree to form a full canopy at maturity.
 - b. No trees shall be planted within 5' of any curbs or paved areas.
 - c. No trees shall be planted within 20' of a building foundation.
 - d. All locations must provide adequate moisture and sunlight levels.
 - e. Soil volume requirements are 900 ft³ for large trees, 600 ft³ for medium trees and 300ft³ for small trees. Calculate using a 3' soil depth.
- E. Tree Planting
 1. Timing
 - a. Plant all campus trees from October to March.
- F. Tree Pruning
 1. Trees shall only be pruned by the SHSU Arborist or under their supervision.
 2. All tree pruning shall be paid for by the project.
- G. Tree Removals
 1. Any tree not chosen for protection is subject to removal.
 2. Removals shall be paid for by the project.
 3. A SHSU Tree Removal Form must be completed and approved for every tree removed on campus.