

## General Information

### Site Paving

Site paving shall be provided to facilitate pedestrian and vehicular access along with emergency and service vehicle access to the site and facility being designed.

Materials, parameters and methods shall be in basic conformance with the TxDOT "Standard Specifications for Construction of Highways, Streets and Bridges," latest edition and applicable ASTM standards.

Subgrade material to receive pavement sections other than pedestrian sidewalks which has a plasticity index (PI) greater than 17 shall be stabilized in place with lime prior to placing the pavement. Lime shall be placed in slurry form or with Owner approval, lime may also be dry placed as Type C pelletized quicklime (grade DS). Lime shall be thoroughly mixed into the subgrade with a rotary pulverizing mixer using a two step preliminary mix/final mix procedure with appropriate curing times between mixes and compaction before opening to traffic or placing additional courses. Subgrade material to receive pavement sections other than pedestrian sidewalks which has a plasticity index (PI) less than 5 shall be stabilized in place with Type I Portland cement. The cement shall be dry mixed into the subgrade using a rotary pulverizing mixer, appropriate water added and then thoroughly mixed with the cement and soil until a full depth uniform mix has been obtained. Appropriate compaction and moist curing shall occur prior to placing additional courses. Stabilized subgrade shall be compacted to the requirements of the Geotechnical Engineer or to a minimum of 95% of the maximum density as per ASTM D-698 . Stabilized subgrade shall extend a minimum of 12" beyond the supported pavement section. The amount of lime or cement to be added to the subgrade and the depth of stabilization shall be determined by the geotechnical consultant based on design mix tests and anticipated traffic loadings.

Pavement sections subject to vehicular traffic shall be either a rigid section of portland cement reinforced concrete (PCRC) or a flexible section consisting of hot mix asphaltic concrete (HMAC) surface over an approved flexible base material (coordinate pavement type selection with Owner). PCRC pavement sections shall be a minimum of 6" thick. Finish shall be broom or burlap drag. HMAC shall be Type "D" and the flexible base material shall be Type A, grade 1 or 2 as defined in the TxDOT standard specifications. A rolling pattern for HMAC shall be established using a Troxler Nuclear Density Gauge. The flexible base shall be compacted in maximum 8" lifts to a minimum density of 95% of the maximum density as per ASTM D-1557 and shall be primed with approved asphaltic material at a rate established by the team and shown on the plans prior to HMAC placement. The HMAC surface course shall be compacted to contain 3 to 8 percent air voids when tested in accordance with Tex-207-F and Tex-227-F.

The thickness of the pavement section elements shall be recommended by the geotechnical engineer based on soil conditions and anticipated traffic loadings.

Pavement at trash dumpsters, loading docks, etc. subject to heavy vehicular maneuvering and turning shall be PCRC. Concrete pavement shall typically be edged with a 6" concrete curb. Preferably the curb shall be poured monolithically with the pavement but doweled curb sections are allowed.

If poured separately the curb section shall be recessed 1" into the pavement and attached with dowels of sufficient spacing and length to hold the curb firmly to the pavement.

HMAC flexible pavement sections shall typically be edged by reinforced concrete curb and gutter to receive storm drainage from the pavement and to stabilize the pavement edge. Place doweled expansion joints in curb and gutter as a minimum at end of radius returns, at curb inlets and at maximum 40' centers in straight runs. Expansion joints in curbs with adjoining sidewalks shall match the joint location and spacing in the sidewalk. Contraction joints a minimum depth of 3/4" or 1/4 slab depth whichever is greater shall be placed at 10' intervals. Curb and gutter section shall be placed on 4" of flexible base material compacted to the same requirements as the pavement section.

Reinforced concrete valley gutters shall be placed in areas of concentrated storm water runoff across HMAC pavement such as at street/driveway intersections. The valley gutter section shall be placed on 4" of flexible base material compacted to the same density requirements as the pavement section. Doweled expansion joints shall be placed in valley gutters at maximum 40' centers.

All pavement/surfaces and gutters shall be crowned and/or sloped sufficiently to positively direct storm runoff to points of discharge or collection as to eliminate 'birdbaths'. Minimum cross slopes for open pavement areas shall be 1%; minimum crown for streets shall be 6" above the gutter line; minimum slopes for curb and gutter shall be 0.5%.

Concrete for all site paving/curbs/gutters shall have a minimum compressive strength of 3,000 psi at 28 days. Reinforcement shall be new deformed steel bars conforming to ASTM A615, Grade 60 minimum No. 4 bar in size. No welded wire fabric shall be used as reinforcement except in unique situations as approved by Owner. All concrete shall be adequately cured by protecting it against moisture loss for a period of not less than 72 hours beginning immediately upon completion of finishing operations and initial set of concrete.

The basic configuration of parking lots shall be as follows:

Parking Angle:	MOST EFFICIENT USE OF SPACE
Stall Width:	9' - 0"
Module Width:	62' - 0" (stripe to stripe), 60' - 0" (face of curb to stripe), 58' - 0" (face of curb to face of curb)
Drive Aisle:	24' - 0"
Stripe Width:	4"
Stripe Length:	18' - 0"
Stripe Colors:	White for general parking. Yellow for no parking, and loading. Blue for accessible.
Landscaped Medians:	Planted with low profile vegetation, irrigated, and spaced appropriate to the design.
Concrete Mow Strips:	2'-0" wide back of curb for head-in parking when no wheel stops are provided
Lighting:	0.9 foot candles

## Concrete Walks

Pedestrian sidewalks shall be PCRC with a minimum thickness of 4" and a minimum width of 6'. Pedestrian sidewalks that may also be service and/or emergency vehicle pathways shall be a minimum of 6" thick and appropriate width. The finish shall typically be a broom finish but shall be coordinated with any campus standard finish schemes. Sidewalks shall be cross-sloped (max. 2%) in the direction of site drainage patterns. Sidewalks adjoining concrete curb and gutter shall be doweled into the curb and gutter section. Sidewalks adjoining foundations at doors and other points of pedestrian circulation shall be doweled to the foundation in a manner to prevent differential movement.

Avoid surface drainage of storm water across sidewalks.

## Expansion & Control Joints

A jointing plan shall be prepared as part of the design plans showing the type and location of joints in all PCRC pavements including sidewalks and curbs/valley gutters. The expansion joints in sidewalks shall be placed at walk intersections and at maximum 20' centers in straight runs. Expansion joints, contraction joints, construction joints and isolation joints shall be placed in accordance with good engineering practice as required to control cracking and other distress in the concrete pavement and to facilitate construction. Concrete sawn joints shall be cut "green" using the "soft saw cut technique" as soon as the concrete hardens to support the weight of an early entry type concrete saw and operator to avoid raveling.

Expansion joints shall consist of smooth bar dowel assemblies conforming to ASTM A615, grade 60 with a PVC sheath over the free end, approved filler and cold applied self-leveling polyurethane sealant with closed cell polyethylene backer rod or bond breaking material.

## Bicycle Racks

Show bicycle racks in sufficient quantity near but not in front of entrances, and under cover when possible. Use

standard ribbon hot dipped galvanized pipe type embedded in concrete.

These details shall be incorporated in the drawings. The number of racks required will be determined during the schematic design stage with the FPC Project Manager.

## Trash Dumpsters/Trash Compactors

1. Provide a concrete pad either in the loading dock service yard or a separate screened enclosure for trash dumpsters.
2. Concrete slab capable of handling 7800lbs continuous load.
3. Slab to be sloped 1/8" per foot back to front.
4. Minimum interior dimensions: 12' wide x 7' deep x 7' high. Open top
5. Minimum opening for access 10' wide do not install gates or restrict access to dumpsters.
6. Exterior walls to be constructed of comparable material to associated building and constructed to allow for continuous cross ventilation.
7. Anchor constructed with eyelet of 1/2" high carbon steel rod secured in the concrete slab capable of holding an 8 yard front loading container in a 140 mile/ hour wind.
8. Design and construct to allow drive up access by front loading 30 to 40 yard capacity waste management vehicles with 38' minimum turning radius.
9. Overhead clearance required to allow overhead dumping of front loading containers
10. Approach to pad to be constructed at comparable slope or grade to that of the container slab.
11. Refer to the Facilities Department for the type of dumpsters used, access requirements, and any other equipment or area requirements that may be needed for the equipment.

## Porches and Steps

All stoops, porches, docks and steps, exterior and interior should have built-in abrasive surfaces. Slope exterior porches and treads to drain water 1/4" per foot. Exposed concrete finished work shall be accomplished in two pours: the first structural and the second being a two inch minimum finish topping poured near completion of project. WTAMU prefers a single pour system, to avoid potential freeze thaw damage. Primary entry floors may be constructed using brick, tile, pavers or other permanent floor materials.

## Landscaping

All landscaping plantings shall be planned and designed to be compatible with the existing overall campus landscaping scheme. Emphasis shall be placed on durability and low maintenance characteristics. Prior to project, designer shall meet with SHSU Grounds to discuss compatibility with overall campus landscaping scheme. Final landscape plans and designs must receive approval from SHSU Grounds department prior to placing of any landscaping.

Final grading of site must receive approval from the SHSU Grounds Department prior to placing of any landscaping.

All topdressing and bed work-up of an enriched topsoil shall be submitted two weeks prior to beginning of project to SHSU Grounds. Planting Mixture- Premixed blend of 50% topsoil, 50% organic matter, and sand in a ratio suited for the area and plant material specified. Seasonal color beds shall have 2" depth of peat moss tilled into top layer of planting mix before

installation of plant material.

Planters- 12" Minimum of planting mix placed in planter. Crown surface for drainage.

Turf Areas- 2-3" of topsoil placed and fine graded before placement of turf.

Weed fabric/ cloth/ barrier shall not be accepted.

Concrete Mow Strip- Planter areas that are adjacent to turf areas shall have a 12" wide x 4" thick, reinforced concrete mow strip. Reinforcing shall be No. 3 rebar. Medium broom finish. Concrete shall be 5 sack mix, 3000 PSI at 28 days, minimum. Adjacent to building the mow strip shall be minimum 24" wide with an expansion joint and not doweled to the building foundation.

All disturbed areas shall be graded to properly drain and seeded or sodded with a permanent grass.

Sod- Sod shall be variety approved by the campus representative.

Sod shall be composed of certified, approved, or nursery grown grass and shall be true to name/variety. Sod shall be substantially free of noxious weeds, disease, insects, thatch and undesirable grasses. Sod shall have a sufficient density so that no surface soil is visible at a mowing height of 1.5 "(inches). Sod shall be neatly mowed and mature enough that when grasped at one end it can be lifted and handled without damage to the sod. Maximum mowing height shall be 2.5 "(inches).

Sod shall be cut to provide a sufficient root zone and stand of live grass. Sod shall be cut with a uniform soil portion of a 1/2" thickness, plus or minus 1/4 inches.

Sod shall be cut, delivered and installed within 24 hours of cutting. Sod shall be cut by mechanical means such as sod cutters. Sod shall be cut when the moisture content (either excessively wet or dry) will effect the lifespan of the sod.

Area to designated for sod, shall be fine graded, smoothed, topsoil placed before final grading. If soil is dry, lightly moisten before placement of sod.

First row of sod shall be placed in straight line with additional placement of rows shall be parallel and tightly placed against each row. Staggered lateral joints butted tightly shall be used. Sod shall not be stretched or overlapped.

No landscaping slopes shall exceed 30% without having to be terraced.

Sod on slopes greater than 3:1 shall be placed perpendicular to slope. Sod on slopes shall be temporally fastened to ground by stakes, staples, pegs or other approved methods. After sod has become established, contractor shall remove fasteners.

Sod shall be lightly rolled after section is placed. Once sod has been placed, immediately water sod to prevent excessive drying. Thoroughly water sod so that underside of sod and soil are completely wet.

Existing trees on site that are to remain during construction are to be protected

from all construction activities by fencing at least five feet tall encompassing the drip-line of tree. At conclusion of project, existing trees are to be left at original grade with no excavation or backfilling within the drip-line. If these conditions cannot be met, then the tree shall be removed during construction and replaced.

Trees are to be of quality consistent with ISA Standards and planted according to the same guidelines. Location of trees must be coordinated with University Arborist and with underground utilities such that expected drip line of trees at maturity does not interfere with future excavation for maintenance of utilities.

## Irrigation

Design and installation must meet TCEQ (Texas Commission on Environmental Quality) irrigation laws and requirements. Irrigation systems shall be installed under the supervision of a Licensed Irrigator.

The irrigation system shall be positively separated from the domestic water system by a double check or reduced pressure type backflow preventer meeting the requirements of AWWA C506 and city of Huntsville. Type chosen shall be suitable to the installation location and conditions. Backflow preventers may be placed in the mechanical space of the building when appropriate. All Backflow preventers shall be placed above ground, should be located to minimize visibility, and or concealed with plants or landscaping features to maintain aesthetics. Covers shall be provided.

Enclose pipe and wiring beneath roadways, walks, curbs, etc., in sleeves. Extend sleeve ends 24" beyond the edge of paved surface. Mark sleeve location with 3/8" X 3" brass or stainless steel stove bolt embedded in the concrete at each end. Sleeving pipe beneath pedestrian pavements shall be PVC Class 200 with solvent welded joints. Sleeving pipe beneath drives and streets shall be Schedule 40 with solvent welded joints. Sleeves installed under pavement for future irrigation installation shall be loose capped on each end and marked with stove bolts as above. Size and depth of sleeve should be coordinated with the landscape architect, with a minimum size being 4".

Mainline and lateral pipe shall be PVC Class 200 and have bell ends. Mainline and lateral fittings shall be PVC Schedule 40. All PVC pipe and slip fittings shall be joined with primer and solvent cement. Cure time for cement should be in accordance with manufacturer's instructions. For threaded PVC connections, use only Teflon-type tape. When connection is PVC to metal, the PVC component shall have male threads and the metal component shall have female threads.

The satellite irrigation controllers should be located outside the building or as directed by the Facilities Department. Controller units shall be compatible with the existing campus controller system. For controller, provide quick disconnect from power source next to controller.

Electric wire from the satellite controller to each remote control valve and the common wire shall be AWG No. 14 solid copper, type UF cable, UL approved for direct underground burial. Wire color should be continuous over its entire length. Use white for common ground wire. Use easily distinguishable colors for other control wires. Control wire splices shall be made with 3M-DBY or equal direct burial splice kit. If multiple splices are made in one location, splices are to be placed in a valve box. Install



a control wire from controller to each remote control valve. Multiple valves on a single control wire are not permitted. Control wires shall be in same trench as constant pressure lines. Provide an isolation valve for each zone; however, it is acceptable to install 2 zones to an isolation valve if necessary. Remote control valves shall be placed in valve boxes.

Remote control valves and irrigation heads should be compatible with existing campus irrigation system. Head to head spacing is required. Spacing must not exceed manufacturer's recommended spacing. All heads shall be adjusted to factory specifications.

Excavated material is generally satisfactory for backfill. Backfill shall be free from rubbish, vegetation, frozen materials, and stones larger than 2 inches in dimension. Backfill placed next to pipe shall be free of sharp objects which may damage the pipe. Contractor shall be responsible for adding soil to trenches after settling has occurred. Upon completion of work, remove from the site all tools, excess materials, and rubbish. Contractor shall provide a demonstration and walk through of entire irrigation system with Owner and Owner's Representative.

Contractor shall supply record drawings ("as built") of all irrigation as installed in ground to Owner or Owner's representative. Zones, back flow preventer, and controllers as well as the zone flow measurement for each zone shall be included and shown on the drawings. Drawings shall be at a scale no smaller than one inch equals thirty feet. Drawings shall be sealed, dated and signed by licensed irrigator in the State of Texas. Operation manuals for controller and other irrigation equipment shall be submitted at time of record drawings.

## Campus Specific Information

### Trash Removal

Front loading trucks used at SHSU.

### Irrigation Materials

Rainbird Controllers  
Toro Valves  
Hunter Sprinkler Heads

### Site Furnishings

#### **Public Areas Benches-**

#### **Trash**