

Louisiana State University Design Standards

DIVISION 32 – EXTERIOR IMPROVEMENTS

1 SITE DESIGN REQUIREMENTS

- 1.1 The Exterior Environment conceptual design is to be developed concurrent with the overall project plan, and the project team shall include a landscape architect and a civil engineer for all projects which affect the design.
- 1.2 Projected cost estimates submitted at each phase of the design process shall clearly identify and include all exterior site elements.
- 1.3 A presentation package shall consist of an illustrative landscape/hardscape plan consistent with the project design theme and Owner's objectives for the project. The plan shall address and delineate a general concept for all site amenities and improvements.
- 1.4 Plans shall be of sufficient construction detail and labeling to clearly communicate landscape/hardscape intent and accuracy of scale in order to provide credible pricing for owner's approval prior to commencement of construction documents.
- 1.5 Plans listed below shall be provided beginning at the design development phase for preliminary pricing
 - 1.5.1 Construction and Staking Plans
 - 1.5.2 Grading Plans
 - 1.5.3 Lighting Plans
 - 1.5.4 Planting Plans
 - 1.5.5 General Landscape Plans
 - 1.5.6 Irrigation, Electrical and Sleeving Plans
 - 1.5.7 Drainage Plans (if applicable, Surface and Subsurface, tie into Civil)
 - 1.5.8 Erosion Control Plans (if applicable)
 - 1.5.9 Waterscape/Pottery/Exterior Furniture Plans
 - 1.5.10 Tree Protection Plan
 - 1.5.11 Details
 - 1.5.12 Wayfinding (building, parking, regulatory)
 - 1.5.13 Donor signage (If applicable)
- 1.6 Submittals of samples, cut sheets or on-site product selection and approval at supplier warehouse or nursery shall be necessary to obtain designer's approval. Approval of samples will be necessary for all materials, including concrete finishes, natural stone paving, finish surface for walls, caps, pilasters, fence, drainage materials and devices, light fixtures, turf, pottery and fixtures, etc.
- 1.7 Typical Designer requirements
 - 1.7.1 Designer to identify projects impact on parking for normal use and game day use.
 - 1.7.2 Designer to identify dumpster locations.
 - 1.7.3 Designer to consult Campus Landscape Standards to verify all site furnishings and materials match LSU campus standard.
 - 1.7.4 Designer to consult Campus Landscape Standards to verify all Plant material selected adheres to campus standards.
 - 1.7.5 Designer should consult LSU Masterplan to determine project's overall theme and layout fit within guidelines adopted for future campus planning.
 - 1.7.6 Designer has specified proper LSU standard wayfinding signage including regulatory signs (i.e. ADA Parking).

2 GENERAL CONSTRUCTION REQUIREMENTS COORDINATED BY THE DESIGNER

- 2.1 The General Contractor shall provide a detailed Landscape, Hardscape, Irrigation and Lighting Schedule for review and approval by the designer that will assure adequate coordination of the installation of all landscape and other construction tasks prior to the planting of turf grass.
- 2.2 Turf grass establishment prior to building opening shall be a contract requisite. Therefore, all other construction tasks must be properly scheduled to accommodate the time required for turf grass establishment. All disturbed areas during construction shall be properly sodded with a LSU PDC approved solid sod. Fine grading and debris removal for turf establishment are the contractor's responsibility.
- 2.3 Construction staging should be planned in the Design Development phase of the project and included in the Design Development submittal. LSU PDC shall provide approval after consultation with the Office of Parking and Transportation Services and LSU Landscape services.
- 2.4 Measures should be incorporated to ensure safe travel of pedestrians and vehicles during construction. If construction staging is located on an existing parking lot, the project shall be required pay for the temporary use of these spaces and restoration after construction. Staging areas will not be allowed so as to create potential conflicts with fire lanes. The Contractor shall coordinate with the Facility Services- Landscape Services department regarding maintaining trash/recycling services to ALL buildings in or around the construction area throughout the construction process and in conjunction with the University Landscape Architect regarding tree protection.

3 EXTERIOR ENVIRONMENT

- 3.1 Site Survey, Civil, Grading, Drainage, Green Infrastructure
 - 3.1.1 Site Survey - The design team shall define for the owner (if required) the specific requirements for a current certified land survey operator. This survey shall include: topographic contours, spot grades, lines of streets, alleys, pavements, and adjoining property; deed restrictions, boundaries, easements and contours of the Project site, locations, dimensions and complete data pertaining to existing buildings, other improvements and existing trees, and information concerning available services and utility lines both public and private, above and below grade, including inverts and depths.
 - 3.1.2 Civil - The Landscape Architect and Civil Engineer shall produce final construction documents on the same base sheets to assure coordination of plans.

4 VEHICLE ACCESS AND PARKING

- 4.1 Streets and Driveways
 - 4.1.1 All streets and driveways must meet highway standards for construction and maintain an optimum width of 24' for two- way traffic and 12' for one way traffic. If site conditions do not allow the optimum layout, an absolute minimum width of 22' for two-way traffic and 11' for one-way traffic may be allowed.
 - 4.1.2 Consideration shall be given to providing minimum 5' bike lanes. If existing conditions do not allow bike lanes, consideration shall be given to providing wider sidewalks to provide multi-use paths.
 - 4.1.3 Islands and any other physical barriers should not be employed to channel traffic. Signage and other traffic control devices should conform to the most current Manual on Uniform Traffic Control Devices.
- 4.2 Parking Lots
 - 4.2.1 The general design to maximize use of parking areas on the LSU campus is to employ a 90 degree parking space 9' feet wide and 18 feet long with an optimum bay width of 57 feet to a maximum of 60 feet for a double and 41 feet to a maximum of 43 feet respectively for a single bay.
 - 4.2.2 If the site conditions do not allow for the optimum layout, a minimum bay width of 55 feet for a double bay and 39 feet for single bay is acceptable. Parking quantities shall be designed at a rate of 1:1 for residential areas, .7:1 for commuter lots, and 1:200sf of office space and shall meet all federal requirements for the Americans with Disabilities Act.

- 4.2.3 The second method to maximize parking is 70 degree parking. The space width is 9 feet by 16 feet. Double loaded bay widths are 49' minimum, 51' optimum, and 53' maximum. Single bays are 19' minimum, 21' optimum, 23' maximum.
- 4.2.4 Parallel parking standards are 21' long by 8' wide. However parallel parking will be allowed only as directed by LSU PDC.
- 4.2.5 Handicapped spaces must comply with current ADA standards.
- 4.2.6 Layout of all parking areas must be approved by the Office of Parking & Transportation Services before implementation. Where existing parking capacity is displaced by the construction of a new facility, those displaced parking spaces must be mitigated on a one-for-one basis. Designers should submit for review a traffic study for vehicular circulation to and around the new facility, including service, delivery and public transportation vehicles. Show turning radii for garbage trucks and delivery trucks into and out of parking lots if necessary.
- 4.2.7 The University has numerous card access gated parking lots. Any additional card access controllers must be compatible with the existing system. Further information can be obtained from the Office of Parking & Transportation Services.
- 4.2.8 Lighting is to be included as part of parking lot projects. Light standard locations should be considered relative to tree planting in order to avoid dark areas in parking lots and should be coordinated with the landscape consultant.
- 4.2.9 Provided two 4" (minimum) sleeves under new paving to all green areas. Identify sleeve locations on As-Built drawings and provide 3/8" X 3" brass stove bolt in pavement at the location of each sleeve.
- 4.2.10 In addition to all other landscaping requirements, all new off-street parking lots with fifty (50) or more spaces shall provide and maintain landscaped planting areas within the interior of, and adjacent to, the parking lot.
- 4.2.11 Perimeter landscaping shall be provided a rate of one (1) tree for every seventy-five (75) linear feet of paving frontage. Trees shall be spaced so that there is a minimum of one (1) tree for every one hundred twenty-five (125) linear feet of paving frontage.
- 4.2.12 Interior tree planting shall be provided at a rate of one (1) tree for every forty (40) parking spaces located in islands at the end of parking bays, island located between parallel rows of cars, driveway medians, intermediate islands or a combination of locations. In addition to the required trees, interior planting areas shall be grassed, landscaped or covered with mulch.

5 SITE FURNISHINGS

- 5.1 Reference Campus Landscape Standards for all furnishings.
- 5.2 Bicycle Racks
 - 5.2.1 Bicycle riding is encouraged on campus and bicycle racks should be included in the project when appropriate. Bicycle parking sites shall be considered at the schematic design phase and final site locations indicated in the final construction documents. Consider bicycle parking and parking surface as part of the construction costs.
 - 5.2.2 The number and location of bicycle racks is determined in joint consultation with the LSU Office of Parking & Transportation Services and LSU Campus Planning.
 - 5.2.3 Follow the guidelines below when determining bicycle parking quantity and location
 - 5.2.3.1 Residential Facilities - Provide bike parking spots within 300 feet of a building entrance for at least 15% of the building occupants.
 - 5.2.3.2 Non-Residential Facilities - Provide bike parking spots within 300 feet of a building entrance for at least 5% of the building's peak users. Estimate peak building users by applying an efficiency factor of 75% to the building's occupancy.
 - 5.2.3.3 Bike racks shall be: Dero-Campus Rack, galvanized finish, surface mounted or equal manufacturer.

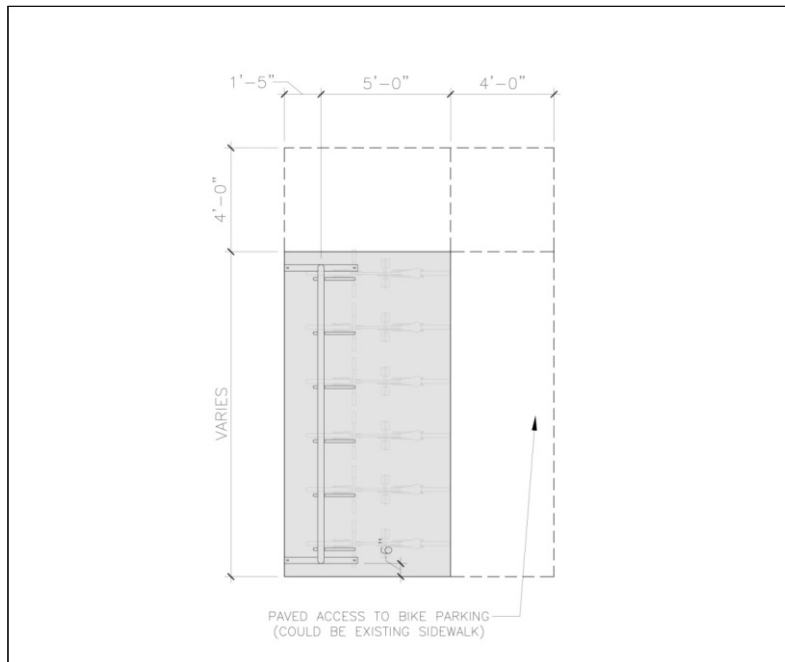


Figure 1 Double Sided Bicycle Rack

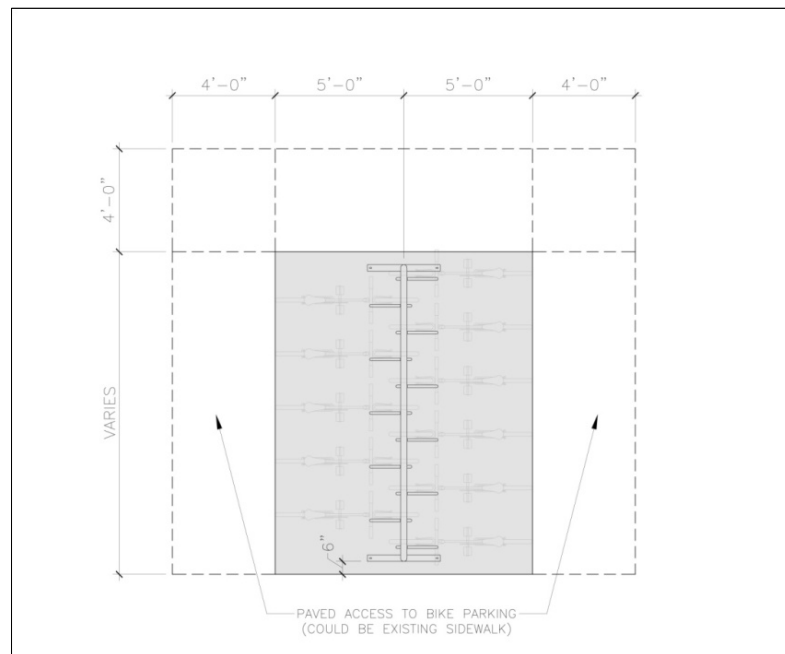


Figure 2 Single Sided Bicycle Rack

- 5.2.4 When locating bicycle racks, choose locations that are accessible by bicycle. Bicycle parking racks should be installed on a paved surface. The dimensional requirements of the paved surface are described in the sketches below. Designer should consider future expansion opportunities.
- 5.3 Benches - Benches are the primary seating component on campus. Many styles and designs of benches have been used on campus throughout its history. The campus standard bench with a back is a simple metal-strap bench that is durable and provides a comfortable seating experience. The character of the bench is complementary to other standard site components. See campus landscape standards for acceptable manufacturers.
- 5.4 Litter Receptacles - A metal strap-style receptacle is the campus standard. It is similar to the standard bench and other site components. A domed top prevents rain and leaves from falling into the receptacle, and a side door allows easier access for staff. When receptacles are located adjacent to garden or groundcover planting,

provide sufficient space around the unit for emptying and cleaning. LSU is a smoke-free campus and trash receptacles should not include ash trays. See campus landscape standards for acceptable manufacturers.

6 EXTERIOR LIGHTING

6.1 General Requirements

- 6.1.1 Landscape lighting design shall be conceptually designed by the Landscape Architect, with particular attention paid to creating a soft, serene and safe nighttime atmosphere. The ambiance afforded by landscape lighting is especially important in transforming the landscaped areas into pleasant, special experience for the students. Walkway lighting shall be very subtle and discreet, utilizing surrounding landscape illumination to serve the purpose of walkway lighting to the extent possible. See campus landscape standards for requirements.
- 6.1.2 Lighting of special feature items or special seasonal displays and points of interest will be accomplished through landscape lighting. Provide additional circuit capacity at the building entry Porte Cochere and plazas.
- 6.1.3 Landscape lighting design will be determined by light quality to create the desired atmosphere. Fixture style and specifications are outlined in the Campus Landscape Standards.
- 6.1.4 The Landscape Architect shall employ a qualified Lighting Consultant to ensure the proper execution of the lighting concept. This design is to be carefully coordinated with the exterior building lighting.
- 6.1.5 Landscape lighting shall be furnished and installed by the Contractor per the plans and specifications. Electrical service and circuiting shall be provided by the General Contractor as part of the Project's electrical contract. Information for electrical service requirements shall be obtained from the landscape lighting plans and specifications.
- 6.1.6 All site lighting shall be controlled on separate circuits from Landscape Lighting through either time clocks and/or photocells.
- 6.1.7 It is the designer's responsibility to layout the conduit and trenching to avoid significant tree cut cutting to install new electric lines. LSU landscape architect must approved any work done under any live oak tree root zone.

6.2 Landscape Installation

- 6.2.1 Exact physical locations of all landscape lighting fixtures shall be determined in the field by lighting consultant in coordination with Landscape Architect after tree pits are dug.
- 6.2.2 All exterior transformers and junction boxes shall be located in areas concealed from the public, as identified by the Landscape Architect and Owner.
 - 6.2.2.1 All exterior weather proof J-boxes shall be rated for NEMA 4X. Any above grade boxes shall be painted to match adjacent surface as specified by the Landscape Architect.
 - 6.2.2.2 Each ballast and junction box shall be specifically located by the Landscape Architect.
 - 6.2.2.3 All exposed conduit shall be painted out to match the adjacent surface as specified by the Landscape Architect.
 - 6.2.2.4 Final adjustments of all landscape lighting fixtures shall be approved by the Owner. Adjustments or proper focus of lighting shall be conducted as part of the contract.

7 EARTHWORK

- 7.1 The grades for all exterior areas shall be set to adequately accommodate surface site drainage.
- 7.2 Earthwork shall be accomplished in accordance with the project's Soil Report (if required) that has been accepted by the Owner.
- 7.3 Earthwork shall be consistent with the design requirements of the Structural and Civil Engineer's design.

8 GRADING

- 8.1 The final site grading plan shall assure there will be no standing water on any surface of the Exterior Environment, including but not limited to all landscape/softscape areas, hardscape surface areas, etc. The maximum approved slope grade shall not exceed 3:1 unless approved. Additionally, the Landscape Architect shall coordinate with the Architect to assure there are no areas of conflict concerning surface runoff water.

- 8.2 Finish grades and land contours shall be incorporated in to the Civil Engineering plans. The contractor shall be held responsible for providing earth surfaces finished to give positive gravity drainage away from the buildings and walks in areas of new construction.
- 8.3 Finished slopes shall be free from irregularities, hollows, or depressions. Soil shall be fine graded and free from construction debris. Provide sod to all areas damaged by construction.
- 8.4 Require Contractor to obtain LSU excavation permits & utility shut off requests for the intended project.
- 8.5 Require Contractor to Identify/mark drainage and utility structures on site and with construction stakes and keep track during all phases of construction.

9 EROSION CONTROL

- 9.1 Erosion control is the responsibility of the contractor. An Erosion control plan shall be provide in the design documents for LSU PDC approval.

10 RAINWATER DRAINAGE

- 10.1 Ground floor slab elevations shall be above adjacent streets, parking lots and one foot above the base 100 year flood plain. Confirm final finish floor elevation with University personnel prior to completion of Construction Document phase.
- 10.2 Site drainage shall provide satisfactory runoff of storm water during normal rainfall conditions and prevent any pockets of standing casual water creating detriment of nuisance to horizontal paved surfaces and planted landscape and lawn areas. The inlet structures should be designed with consideration for seasonal heavy leaf accumulation and catch basins located for ease of regular maintenance.
- 10.3 Site drainage considerations shall include subsurface drainage in areas of poor internal soil moisture percolation which results in saturated soil conditions causing detriment to plant growth in landscape areas, nuisance seepage onto horizontal paved surfaces and continuous seepage through retaining walls leaving unacceptable stains.
- 10.4 Surface drainage infill structures shall be located and grades set to accommodate surface runoff. Size of drain lines, drainage inlets and points of connection are to be established and connected to the main site storm drainage lines. Locate drainage apparatus away from entrances and under Live oak trees.
- 10.5 Subsurface drainage for over structure planters, planting beds, and tight soil areas where poor internal water percolation exists shall be designed and coordinated with Facility Services for points of connection into the site main drainage system and for inclusion of subsurface drainage lines with civil plans.
- 10.6 Drainage design shall show that existing drainage system is sufficient to accept new drainage patterns/flows/areas. If it is not, designer must notify Owner immediately so corrective actions can be considered/taken.

11 GREEN INFRASTRUCTURE

- 11.1 Designer shall identify green infrastructure/low impact development practices that could help avoid water quality degradation. See www.epagov/npdes/greeninfrastructure.
- 11.2 In accordance with Louisiana Department of Environmental Quality's Storm Water Management Program requirements for East Baton Rouge under rule LAS000101/AI 90427/PER 20090001, the plan must describe measures implemented to accomplish the following objectives.
 - 11.2.1 Keep rain out of the sanitary sewer system.
 - 11.2.2 Allow storm water to be absorbed and cleansed by soil and vegetation and either re-used or allowed to flow back into groundwater or surface water resources.
 - 11.2.2.1 Measures can include, but are not limited to, alternative surfaces (vegetated roofs, sediment filters, pervious pavement or grid pavers) and nonstructural techniques (rain gardens, trees and tree boxes, vegetated swales, disconnection of imperviousness, rainwater recycling and rainwater harvesting for non-potable uses such as toilet flushing and landscape irrigation) to reduce imperviousness and promote infiltration, thereby reducing pollutant loadings.

- 11.2.2.2 All measures and monitoring shall be documented in the project's Waste Water Management Plan and shall be capable of removing 80% of the average annual post development total suspended solids (TSS) load based on monitoring reports.

12 TREE PRESERVATION & TRIMMING

- 12.1 A tree protection and pruning plan is required for all projects. The plan shall be developed in consultation with LSU's Landscape Architect (LA) and the University's Project Manager during the schematic or design development phase, and it becomes part of the design and construction documents.
- 12.2 Placement of tree and landscape protection measures, such as fences, protective mulch, protective fabric, and logging mats, should be indicated, as detailed below. The plan is a separate drawing, at an appropriate scale, labeled "Tree Protection Plan," and it should.
 - 12.2.1 Identify size, drip line, species and location of all trees affected by the project.
 - 12.2.2 Indicate which trees and shrubs are to be removed from the site.
- 12.3 When trees and shrubs are removed, care must be taken to protect trees and other landscape elements that are to remain. (Indicate which trees and shrubs are to remain).
- 12.4 All trees determined to be preserved by the LSU Landscape Architect shall be fenced at the drip line of the branches. There shall be no break in the continuity of the fencing. If the lawn has to be maintained within this area, then an adequate lockable gate shall be provided. Coordinate maintenance within the fence areas with LSU Landscape services.
- 12.5 Unless waived by LSU Landscape Architect the tree protection fencing shall be temporary 6' chain link. The area inside the fence shall not be used for any construction activity such as storage, lay down, etc. This includes protection from construction contamination from paint tool washing, diesel, and silt etc. The fenced area must be maintained in good physical and visual condition throughout the project.
- 12.6 Soil mitigation work shall be completed in the root zones of all live oak trees affected by the construction project. This work shall consist of injecting, according to manufacturer's recommendations, Plant Health Care, Inc. MycorTree, Pt Injectable (Ectomycorrhizal Inoculants) and PHC BioPak, or approved equal, into the soil under the drip line of all affected live oak trees.
- 12.7 Mulch shall be placed under the drip lines of the live oak trees affected by the project as determined by the LSU Landscape Architect. Mulch shall be a minimum of 4 inches of fresh or aged hardwood chips or grindings. Mulch shall not be placed on the root flares of the trees.
- 12.8 Any deadwood and/or limited crown reduction pruning of trees affected by the construction project shall be included as part of the project. The work shall conform to ANSI standards A300 and be performed by an arborist licensed by the ISA (International Society of Arboriculture) and/or LAA (Louisiana Arborist Association). All work shall proceed under the direction and observation of the LSU Arborist or the LSU LA.
- 12.9 If the trees affected by the construction project are infected with Ball Moss, the Contractor shall treat with a solution of 5% sodium bicarbonate in water by spraying until drenching on all visible ball moss.
- 12.10 Plans must indicate all trees to be pruned and treated prior to the start of the project.

13 TERMITE CONTROL

- 13.1 Termite treatment shall be provided on sub-grade fill under concrete slab. Provide 2 year bonded guarantee for material and installation with an optional renewal warranty.

14 CONTRACTOR TURNOVER

- 14.1 The Design Team is to develop a sequence of how the site is to be developed, nursery organized and secured, and final landscaping developed. The General Contractor is to incorporate this plan and sequence into his scheduling for turnover of the area of the site to be landscaped. The sequence of landscape installation and site inspection prior to commencement of landscaping shall be approved by the Owner.
- 14.2 Accessibility to the main water supply for the building shall be made available to the Landscape Contractor for irrigation system main tie-in at the time of commencement of landscape activity in any given area. The Contractor is to make provisions for watering of trees that are installed early or existing landscaped areas that are to be maintained through construction.
- 14.3 Landscape maintenance shall be included in the one year warranty after final acceptance.

15 RIGID PAVING / CONCRETE

- 15.1 Color and sample of each material and finished surface shall be approved by Owner. Minimum 6' X 6' field samples shall be provided by the General Contractor for site review and approval of the Owner, as deemed necessary.
- 15.2 Minimum acceptable standards for hardscape surfaces are as listed below.
 - 15.2.1 Minimum width of concrete walks shall be 8' unless specifically approved by Planning, Design & Construction Site Review Team.
 - 15.2.2 All concrete walks shall have a minimum depth of 5" and have a non-slip surface finish.
 - 15.2.3 Provide 4" PVC sleeves under all sidewalks at 100' maximum intervals.
 - 15.2.4 Drill and pin, in both directions, 24" O.C. with #4 steel re- bar all existing concrete that abuts new concrete walks or drives. #4 steel re-bar shall be installed 24" O.C. at all construction joints for new concrete walks.
 - 15.2.5 Porous paving shall be utilized under sensitive areas under live oak trees. Review these areas with Campus Landscape Architect.
- 15.3 Entry Drives are to have a barrier curb along both outside edges. The finish of the curb shall match that of the Entry Drive.
- 15.4 An expansion joint shall be placed between the exterior entry and the Entry Drive and adjacent walkways. Expansion joints are to be kept away from the building entry. Any expansion joints are to be caulked with on approved material and color.

16 TACTILE WARNING SURFACES

- 16.1 Provide truncated domes in sidewalk ramps which abut vehicular areas. The truncated domes shall be installed within the final 2' of paved surface prior to the vehicular use area, and shall be installed across the entire width of the walk. Individual truncated dome paver units shall be used and shall be terra cotta color.

17 BOLLARDS

- 17.1 Bollards are used throughout campus to control and regulate vehicular circulation. Bollards can provide different levels of deterrent and protection depending on the context and application. Bollards can be fixed or removable.
- 17.2 Vehicular Bollards - These bollards function as a warning and physical barrier to prevent most drivers from entering spaces not intended for vehicles, however they are not designed to prevent or stop significant vehicle impacts.
 - 17.2.1 Where occasional vehicular access is required for service or fire lanes, these bollards may feature an embedded sleeve and lock assembly that allows them to be removed temporarily. They may feature simple ornamentation to provide consistency with the character and style of other site elements and architecture.
- 17.3 Pedestrian Bollards - Pedestrian bollards provide a visual separation for both pedestrians and vehicles. Typically made of plastic and including a flexible rubber boot base, these bollards do not offer any kind of physical deterrent to vehicle or bicycle impacts.
- 17.4 Utility Bollards - When physical prevention from impacts is required, utility-style bollards are to be used. Utility bollards are typically steel columns with reinforced concrete cores engineered to withstand the force of a vehicle.
- 17.5 For additional information on bollards see the Campus Landscape Standards for design specifics.

18 FENCES, WALLS & BARRIERS

- 18.1 The purpose of this section is to provide a design standard in regards to fences, walls, and barriers on campus that is consistent with the overall goals and intent of the Campus Landscape Standards and Campus Masterplan which seeks to create a people-friendly environment while at the same time promotes the public health, safety, and the general welfare of the user. A fence if approved by LSU PDC will only be allowed to separate a land use but not to define a property boundary.

- 18.2 To further this goal, the use of fences, walls, and barriers is strongly discouraged and shall only be considered in the following circumstances.
 - 18.2.1 To contain livestock, maintain animal habitats, and/or to maintain other agricultural needs.
 - 18.2.2 To provide a visual buffer of dumpsters, mechanical, and other unsightly structures or equipment.
 - 18.2.3 To prevent unauthorized access to high voltage and/or other dangerous areas.
 - 18.2.4 For security purposes as required by federal, state, or university safety officials.
 - 18.2.5 To enhance the quality of a pedestrian oriented courtyard or space in public and residential areas.
 - 18.2.6 To secure athletic and academic functions.
- 18.3 Design of proposed fences, walls, and barriers is encouraged to reflect the existing heritage and gracious quality exemplified in the historical part of campus through the use of similar materials, color, proportion, and scale. If the use of arches and/or arcades is proposed, then consideration should be given to the character of the arcades surrounding the main quadrangle.
- 18.4 The color palette of materials to be used should be within the range of warm earth tones as seen in the historical part of campus which are generally light in color (i.e., colors found in the sandstone, buff, and terracotta families).
- 18.5 Any fence, wall, or barrier shall be constructed in a durable fashion with a finished surface of brick, stone, decorative masonry material, cast stone, painted metal, approved synthetic material, landscape material, and/or a combination of said materials.
- 18.6 The use of wood and/or chain link fence shall not be acceptable.
- 18.7 Fencing materials shall match surrounding architecture and site character as closely as possible to maintain visual harmony on campus. All designs shall be reviewed by the Planning, Design & Construction department for design integrity and follow the Campus Landscape Standards.
 - 18.7.1 The finished side of all walls or fences shall face the common property line boundary. Approved location of the fence shall be determined by the LSU PDC.
 - 18.7.2 Fences, walls, and barriers shall be designed to be climb resistant, and shall be reviewed by campus security officials.
 - 18.7.3 All fences, walls, and barriers shall allow access by university maintenance and security officials.
 - 18.7.4 When gates are required, they shall be lockable only from the outside and shall conform to all fire and safety codes. Fences, walls, and barriers shall not restrict egress from a confined pedestrian area and Campus Police and Facility Services personnel shall be allowed access at all times.
 - 18.7.5 All designs which utilize landscape materials shall be reviewed and approved by the Campus Landscape Architect.
 - 18.7.6 Temporary construction fencing shall be 6' ht galvanized chain link panels, hardware with foot pads weighted with sand bags. This can be waived by the campus Landscape Architect if the project is a short duration project. Also it must comply with the Campus Landscape Standards.

19 FENCE WRAP AND CONSTRUCTION SIGNS

- 19.1 All building renovations and new construction projects having a contract duration exceeding 60 days and overlap time when school is in session are required to have an LSU standard fence wrap.
- 19.2 All projects over \$125k construction cost with necessary construction fencing.
- 19.3 All projects deemed by the LSU Landscape Architect as a sensitive area shall have a fence wrap.
- 19.4 Exempt projects include
 - 19.4.1 Projects without construction fencing
 - 19.4.2 Site only projects that do not require building material staging.
 - 19.4.3 Service area projects that are not seen from public corridors.
 - 19.4.4 LSU landscape Architect can waive fence wrap requirements.
- 19.5 Fence Wrap Specifications
 - 19.5.1 The Fence Wrap panels are designed in 40 x 6 foot panel sections (optional 20 foot section).

- 19.5.2 Full print coverage. Designed for wide format, 4 color process printing.
- 19.5.3 Designs created in Adobe Illustrator at 400% scale (120 x 18 in.).
- 19.5.4 PMS colors (PMS 512 and PMS 124).
- 19.6 Background Scene
 - 19.6.1 LSU PDC can provide artwork upon request. It is on file at Letterman's printing Baton Rouge.
 - 19.6.2 Adobe Photoshop files for the images to be provided separately.
 - 19.6.3 No logos, images or word printing will be allowed except in this specification.
- 19.7 Company logos and Construction Signs
 - 19.7.1 No logo, images or word printing shall be allowed to be printed on the Fence Wrap.
 - 19.7.2 Contractor's printed logo ONE (1) 6-foot x 12-foot (or smaller) printed mesh Logo sign can be attached over the LSU Fence Wrap at each primary entry to the construction site.
 - 19.7.3 Sign background can be in contrast to the Fence Wrap
 - 19.7.4 Project Signs are limited to the same information above.
 - 19.7.5 Option: Logo and Project Signs can be built out of MDO plywood. Logo limited to one 4' x 8' sheet. Project Sign preferably one (1) 4' x 8', maximum two (2) set as one 8' x 8' sign.
 - 19.7.6 Any requests outside of these parameters, contact the LSU PDC project manager for PDC Director Approval.
- 19.8 Material Specifications (per Letterman's custom printed fence wrap information- attached).
 - 19.8.1 Media Properties- Media: Ultraflex StripMesh Pro LTX, Airflow: 25%, Tensile Strength: 218.94x182.22 lbs/in, Tear Strength: 81.13x61.51 lbs/in, Flame Resistance: NFPA701, Low Temperature: -4 F, High Temperature: 176 F, Air Permeability: 1736 m2/sec, Ink: CMYK Eco-Solvent Inks; Finishing Properties: 1" High-Strength Seam on all sides, 3/8" Brass Grommets applied in 24" increments attach to fence with 7" heavy-duty ties, Finished Size for 6' Fence Wrap: 5' 8".
 - 19.8.2 Graphic companies such as Letterman's can print graphics; however, contractor is not required to use Letterman's. Alternative vendor specifications must be submitted for prior LSU PDC approval
 - 19.8.3 Production Proof from vendor needs to be pre-approved by LSU before printing.

20 IRRIGATION

- 20.1 Landscape Irrigation shall be designed by a licensed landscape irrigator. Comply with LSU Campus Landscape Standards.
- 20.2 The Irrigation System shall be fully automated and controlled by an electrical controller and shall provide 100% coverage of landscaped areas with heads triangularly-spaced with overlapping head-to-head trajectory.
- 20.3 Remote control valves shall be electrically activated.
- 20.4 Turf and planting beds are to be valved separately due to different water requirements.
- 20.5 Turf heads shall be a minimum 6" pop-up spray heads in small cut-up areas of turf and rotary gear-driven heads in large expanse areas of turf.
- 20.6 Shrub and groundcover areas are to receive 12" pop-up spray heads along turf borders, sidewalks and other areas along exterior perimeters where there is no interference from vegetative growth. All interior areas of the bed shall receive shrub sprays on stationary risers with a flex pipe connection to the lateral line. The nozzles on the risers shall be brass.
- 20.7 The automatic controller is to be electromechanical repeat cycle with a master control valve to prevent errant operation. Place in a concealed location (approved by Owner) and all boxes are to be lockable, either by use of a padlock or with an integral lock. Battery operated controllers shall be acceptable on an individual case by case basis.
- 20.8 Irrigation System design is to assure consideration is provided to accommodate prevailing winds and static pressure reading to keep spray off of walks, street and parking areas.
- 20.9 The Irrigation System shall be designed with sufficient quick coupler valves in all areas of the site to be reached with 100' of water hose.
- 20.10 The Irrigation system is to be separated from the domestic water system by a backflow presenter device.

- 20.11 Design shall specify a rain sensor on all campus irrigation systems.
- 20.12 Contractor shall submit a schematic diagram of the completed irrigation system to owner showing all operable zones and the corresponding descriptor on the control box. Review operating procedures with a representative of LSU Landscape Services.

21 PLANTING

- 21.1 Soils & Plant Bed Preparation - The Landscape Architect shall approve soils and plant bed soil preparation and installation for compliance with plans and specifications. Soils and associated amendments have a direct bearing on the performance and ultimate success of plant materials used in the landscape. Selection of soils, amendments and soil preparation mixing ratios shall follow the recommendation of the Agronomic Soil Test and shall be clearly outlined in the construction documents by the Landscape Architect.
- 21.2 Planting Details - Planting beds, pit excavation and backfill for trees, shrubs, groundcover and annuals: Planting plan details and specifications shall clearly address this issue with specific consideration for location conditions regarding diameter of planting pits, depths of planting beds, usability of natural site soil and recommended soil amendments.
- 21.3 Site Landscape Grading & Drainage
 - 21.3.1 Site Grading in preparation for landscape installation shall be in accordance with the site plans. All soils, subgrade or topsoil, native to the site or imported are to be guaranteed free of noxious weeds.
 - 21.3.1.1 All clods, rocks, roots, and other trash, foreign to good friable soil conditions, greater than 1" diameter size are to be raked and removed from the site.
 - 21.3.1.2 The final finish grade for all landscaped areas shall include a 2" layer of topsoil for all turf areas unless otherwise specified.
 - 21.3.1.3 The General Contractor shall assure that all areas or phases of the Project that are ready for landscape installation are graded to specifications, but also clear of all obstacles, equipment and material, etc. that will impair complete and open access to the designated area and ultimately risk quality control of the landscape end- product.
 - 21.3.2 To protect the quality of the landscape, the General Contractor shall control ingress and egress of all subcontractors and trades not directly associated with the landscape installation into all areas designated ready for landscape.
 - 21.3.3 Subsurface drainage using perforated pipe with filter fabric embedded in gravel aggregate shall be installed per plans and specifications in all areas of underground seepage, wet seepage conditions involving paved surfaces, areas slow to percolate due to impervious or tight soil conditions and other site conditions warranting subsurface drainage.
 - 21.3.3.1 All over-structure planter beds and large stationary plant pots shall have subsurface drainage connected directly into the building or site drainage system or a means of dewatering through siphon tubes (saucers with pots are not acceptable).
 - 21.3.4 Plant Material Standards and specifications (all sizes stated are minimum sizes).
 - 21.3.4.1 The Landscape Architect shall approve all plant material used on the Project, prior to shipment from the nursery. Plant materials that do not meet the standards of the specifications and landscape planting plans as described by the Landscape Architect shall be rejected. Landscape Architect shall confirm all plant material is acceptable by LSU as outlined in LSU Campus Landscape Standards.
 - 21.3.4.2 The American Association of Nurserymen Standards shall serve as the standard of quality in developing guideline standards for specification of plant material regarding size for height, spread, caliper, rootball, etc., for container-grown and B&B trees, shrubs, groundcover and annual flowers.
 - 21.3.4.3 Shrub plants shall be planted triangularly and spaced to achieve 100% coverage within a 3-year grow-in period, unless otherwise specifically approved by the Owner.
 - 21.3.4.4 Groundcover: Plant material shall be triangularly-spaced to achieve 100% coverage within a 3-year grow-in period, unless otherwise approved by the Owner.

- 21.3.4.5 Annual flowers: Plants shall be 4" pots minimum, bud and bloomed, spaced 6" o.c. at initial planting. Some species of annual color may be 6" pot size in which case the plant spacing will be adjusted accordingly as approved by the Owner.
- 21.3.4.6 Trees: Size and specification will vary based on species and plant availability. Selection shall necessitate a degree of flexibility and reasonableness based on availability and quality. (Trees must be individually hand-selected and approved by the Campus Landscape Architect.) Specifications shall be in accordance with the applicable selection standards and the Landscape Architect shall specify plants by height, spread, caliper size, rootball and box/container size. All trees shall be tagged with pre-numbered, interlocking tags.
- 21.3.4.7 All plant material delivered to the site shall have tight, firm rootballs. The plant shall not be loose in the rootball at the root crown and the burlap shall be tightly affixed with wire on any rootball greater than 20" diameter. Plants grown in containers shall be fully and deeply rooted and not recently transplanted in such a manner that the roots have not had sufficient time to develop.
- 21.3.4.8 Contract Growing, Special Procurement and On-Site Nursery: Due to plant availability shortages, contract growing of shrubs, groundcover and annual flowers, early procurement of tree plant materials and on-site nursery arrangements may be necessary to have plant materials available for the project of acceptable quality, size and species to comply with the schedule of installation. In this case, the Landscape Architect shall approve procedures associated with such an arrangement and the schedule outlines to accomplish the task. Arrangements for this procedure must begin very early in the Project construction process to allow sufficient time for growing plants.

22 TURF AND GRASSES

- 22.1 Grading of site prior to planting grass must alleviate all pockets of standing or puddling casual water.
- 22.2 Selection of Species: The Zoysia medium turf grass species shall be conducive to the Louisiana region and pre-approved by Campus Landscape Architect, capable of vigorous growth and development of a thick turf cover.
- 22.3 The turf species shall be fine to medium-textured, capable of being developed into manicured turf of refined finish.
- 22.4 The turf quality shall be free of noxious weeds and diseases, true to species as approved by the Owner.
- 22.5 Turf installation shall be by means of solid sod, laid on the finished graded surface, rolled for smoothness and compaction. Plans shall clearly indicate all areas to receive sod.
- 22.6 Turf planting methods other than sod, such as hydro-sprigging or hydro-seeding, shall only be considered on an individual project basis in large areas greater than 100' from outer face of the building as approved by the Campus Landscape Architect.
- 22.7 The General Contractor shall be responsible for providing a 100% fully established turf a minimum of 30 days prior to the opening of the building.
- 22.8 Established turf is defined as 100% ground coverage, matted together sufficiently to support pedestrian foot traffic and growing in a vigorous manner. The turf must be free of erosion, standing water, wet-slow to drain areas, noxious weeds and disease. Newly planted grass must have been mowed on a weekly basis with the proper type mower for at least 30 days prior to final acceptance to be considered established.

23 UTILITIES

- 23.1 The Design Team shall exercise sensitivity to site aesthetics in selecting the location of all infrastructure surface devices such as drain inlets, electric load centers and transformers, backflow devices, utility vaults cleanouts, water meters, etc., with the approval of the Owner.
- 23.2 Water meter and backflow prevention devices will be located in vaults concealed from public view with finish surfaces compatible with surrounding hardscape. Provide freeze protection as required.
- 23.3 Sleeving

- 23.3.1 All horizontal paving shall be sleeved at designated locations per sleeving plans for site lighting, irrigation, and other utilities not installed prior to paving.
- 23.3.2 Sleeves shall be buried below paving a minimum of 4" and a maximum of 15" and be Schedule 40 PVC, 100mm (4") diameter. Provide 3/8" X 3" brass stove bolt in paving at sleeve locations.
- 23.3.3 The General Contractor is responsible to provide an ongoing as-built sleeve plan designating accurate locations and depth.
- 23.4 Street and Roadway Utility Repairs and Replacements: All utility repairs or replacements requiring cuts into roadways, driveways, or parking lots shall be coordinated with the Office of Parking & Transportation Services in advance of the start of work.
- 23.5 In repairing required cuts to complete utility repairs, contractors shall provide a sub base compaction rate standard of 95%. Testing shall be conducted to ensure that the appropriate compaction rate is met. Paving at the completion of the repair shall match adjacent surfaces.

24 QUALITY CONTROL

- 24.1 Quality control is the essence for achievement of the finished product for the exterior environment. The Landscape Architect is to recommend standards for landscape material selection and installation to provide the Owner with a final product that is consistent with other LSU facilities. The Owner shall be involved in the decisions that impact the end-product, including but not limited to, a review and approval of the following.
 - 24.1.1 All aspects of the technical landscape design and installation
 - 24.1.2 Design/build shop drawings and mechanical function
 - 24.1.3 Material selection including plants, stone, aggregate, concrete, furniture, fixtures, lighting, signage, railing, fences, etc.
 - 24.1.4 Finish grading
 - 24.1.5 Surface drainage and details and techniques of subsurface drainage
 - 24.1.6 Irrigation design and equipment
 - 24.1.7 Soils and plant bed preparation specifications including chemical and physical properties
 - 24.1.8 Hardscape design pattern and installation details and materials selection
 - 24.1.9 Water feature design and mechanical engineering
 - 24.1.10 Interior-scape plans, specifications, and materials selections

25 SITE & LANDSCAPE IMPROVEMENTS

- 25.1 Refer to Campus Site & Landscape Guidelines & Standards

26 WAYFINDING IMPROVEMENTS

- 26.1 Refer to Wayfinding Guidelines with Addendum