DIVISION 32 EXTERIOR IMPROVEMENTS

32 10 00 PARKING LOTS

A. Standard Layout: Layout parking lots with nine by eighteen foot (9’x18’) stalls perpendicular to the drive lane. Widths of all drive lanes will be twenty-four feet (24’) minimum. Consider opportunities for snow storage in parking lot layout. Provide parking for persons with disabilities as required by ADA.

B. Slope: Design asphalt parking lots with no less than two percent (2%) and no more than five percent (5%) slope in any portion of the lot. In concrete parking lots provide surfaces with no less than one percent (1%) slope and no more than five percent (5%) slope in any portion of the lot. Design parking lots with uniform slopes and subtle changes in grade between watersheds.

C. Storm Water Drainage: Locate storm water inlets between parking bays, at the edges or corners of lots, and out of drive lanes and roadways. All storm water shall be retained on site or meet current State Codes for retention and detention of 100-year, 12-hour storm water. Provide oil/water separators in the design.

D. Structural Road Section: Design all USU roadways for large vehicle access (i.e. fire trucks). Include parking lot travel lanes that will be used for fire protection, garbage pick-up, deliveries, etc. Obtain a Soils Report if necessary for the design.

E. Parking Lighting: Design lighting layout to provide a minimum light level of 0.5-foot candles at ground level. Coordinate locations of light poles with landscape designer and lighting designer to ensure that tree canopies do not obscure light fixtures. See Electrical Section C7 for USU lighting standards.

F. Landscaped Islands: Landscape islands are desirable to provide shade for parking lots. The design shall accommodate planting types to withstand winter snow removal and stockpiling. Whenever possible, design landscaped islands as bio-swales to reduce run-off contamination and irrigation of the island.
32 20 00 WALKWAYS

A. Walkways: The Consultant shall design walkways to run straight and true to accommodate future pedestrian movements. Use large smooth radii where curvilinear circulation is required. Service vehicles use major walkways to reach areas inaccessible by roads. Walkway intersection radii should accommodate the turning radius of these vehicles. Ensure proper compaction for base material. The Owner may perform compaction testing. Design grading to provide for positive drainage away from walkways and to avoid excessive cross drainage. The minimum walkway width is seven-feet (7’) on minor walkways and eight feet (8’) or greater on major walkways. Show the location of all joints on the drawings. Standard walkways shall be 5-inches (5”) thick for service traffic. Walkways designated as fire lanes shall be 6-inches (6”) thick minimum.

B. Materials: Use concrete to construct all walkways. Obtain approval for the use of other paving materials for accent areas during the design development phase of the project. Refer to Division 3 for detailed concrete flatwork requirements. Use concrete that meets or exceeds USU’s standard concrete mix design.

C. Landscapes along Walkways: Select and locate plant materials that will not spread into walkways at mature growth limits. Consider snow removal and stockpiling in the landscaping design. At mature growth, all plant material shall be 12-inches (12”) from the edge of sidewalks.

32 31 00 FENCES AND GATES

A. Design Standard: The Consultant shall only use fences and gates where required for screening and security.

B. Types Allowed: Design fences of solid masonry or ornamental iron with a continuous 8” x 12” concrete mow strip adjacent to turf areas. Unusual circumstances require consideration of other types of fencing.
32 80 00 IRRIGATION

A. **Modification of Existing Irrigation Systems:** Existing irrigation systems affected by construction are to be modified to accommodate the new construction. USU Facilities Landscape Operations and Maintenance (LOAM) will oversee this work. This includes but is not limited to the following items:

1. Relocation of existing heads, valves, drains, controllers, etc., or the replacement of the same as required by site conditions and the new project.
2. Relocation of existing irrigation main lines, isolation valves, and drains, or the replacement of the same.
3. Providing irrigation water for other areas of campus affected by the construction of the project through temporary mains or other methods.
4. Providing water for all protected existing landscaping on-site during construction.

B. **Design of New Irrigation Systems:** All new systems shall be designed to DFCM guidelines and provide the following performance standards as a minimum:

1. Head-to-head coverage of all areas irrigated. Design coverage at 90% of manufacturer’s listed radii for spray heads and 85% of manufacturer’s listed radii for rotors, maximum.
2. Matched precipitation rates in all areas of coverage, or full circle and part circle rotors on different valves.
3. Prevention of over spray onto buildings, parking areas and walks next to irrigated areas.
4. Complete drainage of system using only manual drain valves for mainlines and compressed air for laterals (Mainline automatic drains are acceptable only for laterals with approval of the University Landscape Architect).
5. Locate valve boxes at the edges of irrigated areas, adjacent to pavement when not subject to damage by vehicles. Group valve boxes side-by-side when more than one box is required in a given location. Provide a brass ball valve to isolate each valve manifold.
6. Average mainline static pressure is 90 psi. Pressure reduction is required for smaller heads and rotors. Design the system using the products specified below to match the precipitation rates of existing and/or adjacent irrigated areas. Direct any questions about other equipment not listed to Facilities Planning Design & Construction (FPD&C).

7. Automatically flushable inline filters are required for 3” and larger sub-mains. Upstream from filters install a master valve and flow sensor with connections to the central control system. Provide or connect flush line to nearest sump or catch basin.

C. **Irrigation Products:** Due to maintenance requirements, specify only the following Rainbird products for uses listed. Any exceptions to these products must meet the same precipitation rates and coverage as the products listed below:

1. For small turf, shrub and flowerbeds use Rainbird 1800-PRS pop-up sprays with matching precipitation nozzles. All pop-up heights shall be six-inches (6”) or greater. Use 6” to 12” pop-ups in shrub beds. Design pressure 30-psi maximum.

2. For medium to large turf and shrub areas use Rainbird 3500 and 5000 rotor pop-ups. Achieve matched precipitation rates by varying nozzle sizes for areas covered. Use Rainbird MPR Rotators in conjunction with 5000 rotor circuits for small or irregular areas. Design pressure 45-psi maximum.

3. For large turf areas use Rainbird Falcon 6504 or 8005 rotor pop-ups. Match precipitation rates by varying nozzle sizes or separating part circle and full circle heads on different control valves. Design pressure 70-psi maximum.

4. Automatic control valves shall be Rainbird EFB-CP-(PRS-D if required) valves ranging in size from one inch (1") to two inches (2") in size as required by each irrigation circuit. Install valves in jumbo valve boxes located adjacent to sidewalks or curbs. Valves are to have unions on both sides of the valve for servicing or replacing the valve.

   For valves one inch (1") and smaller, two (2) valves per jumbo box. For one and one-half inch (1- 1/2") valves and larger, one (1) valve per jumbo box. Group multiple valve boxes together. Include a Brass Ball Valve as an isolation valve for each manifold. Provide sequentially numbered valve tags for each valve associated with each controller.
5. Manual drain valves shall be three-quarter inch (3/4”) Mueller Orseal Drain valves with an internal stop. Provide two-inch (2”) Class 200 PVC sleeves to valves and cap with 6” round valve box. Automatic drain valves shall be King mainline drain valves (red).

   a. Control wire shall be 14 Gauge to turf and shrub areas and shall be different colors. Turf area hot wires shall be red in color with one spare each, hot and ground wires, run to the most distant valve. Shrub area hot wires shall be green in color with one (1) spare each, hot and ground wires, run to most distant valve. Ground wires shall be white in color with blue spare. All wire connections shall be soldered and be sealed watertight. All wire connections shall be located in valve boxes with an eighteen-inch (18”) coil for each wire. Label all spare wires at all valve boxes they pass through.

   b. Use of Multi-strand control wire, 18 ga. with 14 ga. ground wires, is allowed with approval from Facilities Planning, Design and Construction.

6. Use WeatherTRAK Optiflow PRO 12-96 station pedestal/wall mount controllers with lightning and electrical surge protection.

D. Irrigation System Installation: The irrigation systems are to be installed by a licensed landscape or plumbing contractor. Digital As-built drawings are required on all new systems and existing system changes. (The As-Built drawings will conform to as-built drawing requirements of this manual). The contractor shall demonstrate to USU Facilities LOAM that the system functions as designed and provides complete and even coverage of all irrigated areas. The contractor shall show LOAM the locations of all valves and drains. Provide a laminated drawing, sized to fit, for placement inside each controller, labeling and showing the area covered by each valve of that controller.

E. Drip Irrigation: USU uses secondary water for irrigation that requires filtering for drip irrigation. Approved drip irrigation requires an automatically flushing filter upstream of the drip zone valves to protect the emitters from clogging. Check with FPD&C before designing or specifying drip irrigation.
32 90 00 PLANTING

A. **Street Trees:** All projects that front on a public street will have street trees integrated into the design of the streetscape of the project. When existing shade trees are adjacent to the project, new street trees shall maintain same alignment, and spacing. Species and variety may vary from existing with FPD&C approval.

B. **Landscapes around Parking Lots:** Wherever practical, screen parking lots from public view. Surround all parking lots by shade trees spaced 85% of the mature canopy apart but never more than thirty-feet (30’) on center. Specify trees that have a uniform head, that are capable of high pruning, will not lift paving, and provide maximum shade. Design parking lots for snow removal by placing trees back 10-feet (10’) from curb & gutter and selecting shrubs & perennials that can recover quickly from snow piles or die back each year. Where cars overhang the curb of the lot, provide low growing plants to prevent damage to the landscape. Do not place trees and shrubs within the overhang area.

C. **Drought Tolerant Planting:** USU encourages the use of drought tolerant plant material and design in conjunction with LEED and DFCM requirements.

D. **Planting Design:** Specify plant materials that have a history of vigorous growth on the campus of Utah State University. While the campus is in USDA Hardiness Zone 5b, some plants known to grow in this zone will not survive on the campus. Strong canyon winds and very low annual temperatures are the main detractors to plant hardiness. Encourage variation in plant material. The USU campus is part of the State Arboretum. The USU Arboretum committee will review all plant material specified for compliance with objectives stated above. Some projects provide microclimate areas that may allow plants up to Zone 6. Check with the University Landscape Architect when considering these types of opportunities.

E. **Design Coordination:** Coordinate all levels of landscape and site design with the University Landscape Architect. Plant spacing of shrubs and perennials will be reviewed to see that the mature spread of plants are 12-inches (12”) away from hard surfaces and have 14 to 16-inches of clearance from surrounding plants.
F. **Nursery Stock Sizes:** Generally specify trees with a trunk diameter no greater than two (2) inches, particularly in high traffic or highly visible areas. The minimum size tree to specify shall be one and one half (1-1/2) inch trunk diameter.

G. **Warranty:** Require Contractor to guarantee trees, shrubs, perennials, and ground covers for one complete growing season (April 1st to Oct 31st) after date of installation and acceptance.

H. **Topsoil:** See division 31, Earthwork.

I. **Organic Mulch:** Specify only fine-ground bark mulch with no material sizes exceeding 3/8 inches and free of foreign matter. Mulch specification must include a submittal for approval by USU Facilities LOAM.

J. **Headers and Edgers:** Provide mowing strips surrounding all turf areas, except where adjacent to concrete flatwork at the same grades as the turf. Concrete mow strips may be appropriate in some instances at 8x12 inches. Design all lights, signs, poles, utility boxes and other structures placed in turf areas with a mow strip around them. Coordinate this with the appropriate engineers.

K. **Slope:** Minimum slope in swales, design grades for drainage swales, to be no less than two (2) percent in any portion of the swale. Also, provide drainage away from buildings and walled structures at a minimum of two (2) percent in all areas. Avoid surface drainage across walkways.

L. **Tree Wrapping:** Specify tree wrapping for all trees upon planting.

M. **Tree Removal:** Check with FPD&C before designing the removal of existing trees for the project. USU has many State Champion and other significant trees on campus that require preservation and protection from new construction. Specify removal of existing trees by USU Facilities with funding from the project.

N. **Existing Tree Protection:** When existing trees remain within a construction site, the drip line of the tree plus 2-feet shall be fenced off with in-ground posts and chain-link fencing. Show protection line on civil and landscape plans and with included details. USU Facilities LOAM will tieback tree limbs or do pruning work with project funding.

O. **Turf Areas:** Specify sod only for turf areas. Grasses other than Kentucky Bluegrass may be used with approval from FPD&C.
A. **General:** The following requirements shall be incorporated in to the Contract Documents:

1. **Landscape Repair and Restoration:**
   a. Maintain and repair all landscape material on the site, both new and existing, from any damage or any deterioration during the duration of the contract and for one complete growing season after substantial completion.
   b. Cut sod damaged by construction along straight lines with a sod cutter and remove damaged turf. Lay new sod tightly to match existing turf and follow finish grades.
   c. The finished landscape in restored areas shall be consistent with a new landscape in appearance, quality of materials and workmanship. Provide FPD&C with written notice and dated photographs of any existing damage to the landscape before the commencement of work.

2. **Irrigation Repair and Restoration:**
   a. Where damage to existing irrigation systems occur during construction, the Contractor shall repair the damaged irrigation system. USU Facilities LOAM will oversee repairs to existing systems.
   b. Where construction of this project will affect other existing irrigation systems outside the construction area the Consultant shall show the affected area on the drawings. The Contractor shall be responsible to make modifications to existing irrigation systems to maintain water coverage outside construction area. In the event that such modifications are not made, the Contractor will be responsible to restore landscape damage resulting from neglect at no additional cost to USU.

END OF SECTION