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, salt, 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. Place all plant material 12-inches (12") from the edge of sidewalks at mature growth. Place all trees 10' from sidewalks and streets. Consider snow removal and stockpiling in the landscaping design.

D. Tactile Warning Surfacing: Detectable Warning Surface Plates shall be cast iron. Stamped concrete, polymer concrete, concrete pavers/tile, brick, or composite products are not acceptable for use on USU projects

32 31 00 FENCES AND GATES

A. Design Standard: 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. Direct any questions about connection to the existing system to USU Landscape Operation and Maintenance Dept (LOAM) or USU Facilities Planning, Design & Construction Dept. (FPD&C). 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: Design new systems to DFCM and USU guidelines and provide the following performance standards as a minimum: (System should be designed using products specified in next section. Direct any questions about other equipment not listed to FPD&C.)

1. Verify that adequate water pressure is available for the new system. Provide booster pump or pressure reducing station as required.

2. All new point of connections, for 3” and larger sub-mains, require automatically flushable inline filters. Include a bypass between the inlet and outlet of the filter. Upstream from filters install a master valve and flow sensor with connections to the central control system. Provide manual brass drains on both ends of the POC manifold. Provide or connect flush line to nearest sump or catch basin.

3. 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. Plumb and level all boxes.

4. Design systems to be winterized. Add a brass isolation and drain valve to each valve manifold. Complete drainage of each manifold system using only manual drain valves.

5. Divide hydro zones by microclimates.

6. Place trees located in turf on their own zone, so they can be isolated during times of drought.

7. For areas receiving spray or rotators, provide head -to-head coverage. Design coverage at 90% of manufacturer’s listed radii for spray heads and 85% of manufacturer’s listed radii for rotors, maximum.

8. Separate full circle and part circle rotors on different valves.

9. Prevent over spray onto buildings, parking areas and walks next to

irrigated areas.

10. Design planter beds using best practices for water wise 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. If emitters are used 2.0GPH or larger @ 2 per plant is required. No inline drip systems.

C. Irrigation Products: Due to maintenance requirements, specify only the following products for uses listed. Any exceptions to these products must be approved by USU and equal to the products listed below:

1. Controller: Use WeatherTRAK Optiflow XR 12-96 station with conventional wiring. Use a pedestal/wall mount controller with lightning and electrical surge protection. Provide 10-year subscription.

2. Wire: Use 14-gauge controller wire. Station/Zone wires shall be red in color. Spare wire shall be blue in color. Common wires shall be white in color. Station/Zone and common wires shall run to most distant valve. Both station/zone and common wires shall have one spare each. Use water tight grease caps for all wire connections. 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. Use of Multi-strand control wire, 18 ga. with 14 ga. ground wires, is allowed with approval from FPC & D

3. Hydrometer: Hydropoint WTF3-3-300-PD-NO 2-3” WeatherTRAK Flow 3 Hydrometer. See Flow 3 with FlowLink for other installation options.

4. Filter: Amiad 3-ol-msig-steel screen Amiad 3" mini sigma on-line self-cleaning filter, flange and groove coupling . Stainless Steel weave wire screen element. Adi-P Bluetooth range controller. Maximum working pressure 116psi. 140 mesh screens. Or approved equal. Drain filter discharge to adjacent storm drain. House inside aluminum enclosure along with hydrometer. Box shall be StrongBox model SBBC-60ALHP. Provide Insulated winterization coat for filter.

5. Pipe: Use schedule 40 pipe for 3” or less. Use purple C-900 pipe for secondary irrigation mainline 4”-10”.

6. Manual Drain Valves: 3/4” or 1” brass stop and waste drain valves with an internal stop. Provide two-inch (2”) Class 200 PVC sleeves to valves and cap with 6” round valve box.

7. Automatic Control Valves: Rainbird EFB-CP-(PRS-D if required) or approved equal 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 Provide sequentially numbered valve tags for each valve associated with each controller.

8. Isolation Valve: Brass ball valve where needed on any pipe 2” and smaller. No gas cock valves. Gate valve on any pipe larger than 2”.

9. Spray Heads: Rainbird 1800-PRS pop-up sprays or approved equal. Spray heads shall have matching precipitation nozzles. All pop-up heights shall be 4” in turf. Use 6” to 12” pop-ups in shrub beds. Design pressure 30-psi maximum.

10. Rotary Heads: Rainbird R-VAN rotary nozzles and Hunter MP Rotary nozzles, or approved equal. Spray heads shall have matching precipitation nozzles. Design pressure 30-45 psi maximum

11. Rotors: For medium to large turf and shrub areas use Rainbird 3500 and 5000 rotor pop-ups or approved equals. Achieve matched precipitation rates by varying nozzle sizes for areas covered. Use Rainbird MPR Rotators in conjunction with 5000 or 8005rotor circuits for small or irregular areas. Design pressure 45-psi maximum. For large turf areas use Rainbird Falcon 6504 rotor pop-ups or approved equal. Separate part circle and full circle heads on different control valves. Design pressure 70-psi maximum.

12. Drip Line and Emitters: Rainbird Xeri-bug Emitter 2.0 GPH or higher GPH Pressure compensating emitter (such as PC05) or approved equal. Use 2 emitters per plant. USU irrigation systems are prone to clogging; larger nozzles help prevent this.

13. Bubbler: Rainbird 1400 Series Pressure Compensating Bubblers or approved equal.

D. Irrigation System Installation:

1. Buried Pipe Depths:

6”-10” dia. or greater mainline pipe	36” top of pipe
2”-4” dia. or less mainline pipe	18” top of pipe
Lateral pipe	12” top of pipe.

2. Pipe bedding: Provide a sand bed with six (6”) inches minimum coverage around pipes. Provide backfill free of boulders.

3. Contractor shall water pressure test system at 80 PSI for at least 4 hours prior to backfill. The Contractor shall demonstrate to USU Facilities LOAM personnel that the pressure is consistent after 4 hours. The test needs to demonstrate the system functions as designed, and provides complete and even coverage of all irrigated areas.

4. The Contractor shall provide a laminated drawing, sized to fit, and be placed, inside each controller. Laminated drawing shall be legible, clearly labeled and illustrate the area covered by each valve of that controller.

5. Digital record drawings, including contractor submitted as-builts, are required on all new systems and existing system changes. (See Division 1, Section 01 78 39.C for specific requirements on record drawings).

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 PD&C approval. USU prefers 20’ foot planters with trees placed in the middle 10’ away from sidewalk. Trees and grass should not be used in park strips less than 8’.

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 from curb & gutter and selecting shrubs & perennials that can recover quickly from snow piles or die back each year. Provide area with no trees for snow removal piles.

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

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. Encourage variation in plant material. See USU bee initiative. Plants should meet USU bird friendly guide. Plants should be neonicotinoid free plants.

Prohibited trees:

- *Acer negundo*, Boxelder
- *Acer platanoides*, Norway Maple
- *Eleagnus angustifolia*, Russian-olive
- *Fraxinus species,* Ash
- *Populus sp.*, Poplar species
- *Ulmus pumila*, Siberian Elm
- Robinia pseudoacacia, Black locust
- Pyrus calleryana, flowering pear

E. **Design Coordination:** Coordinate all levels of landscape and site design with the USU PD&C. 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 1 ½”. particularly in high traffic or highly visible areas.

G. Tree Installation: An ISA-certified arborist is preferred.

H. **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.

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

J. Organic Mulch: Specify only fine-ground bark mulch with no material sizes exceeding 3/8” and free of foreign matter. Mulch specification must include a submittal for approval. One source is Mountain West Mini Bark.

K. **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.

L. **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.

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

N. **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.

O. 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 showing post staked in the ground. Chain-link fencing should have a sign that reads," Tree and Soil Protection Area, Entrance Prohibited". Contractor responsible for the watering.

P. Turf Areas: Specify sod only for turf areas. Grasses other than Kentucky Bluegrass may be used with approval from FPD&C.

32 72 00 PLANTING RESTORATION

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