DIVISION 32 - EXTERIOR IMPROVEMENTS

BASES, BALLASTS, AND PAVING 32 10 00
Roadway and parking sections are to be designed by a licensed Geotechnical Engineer pursuant to the Traffic Index associated to the roadway or parking lot. Base shall not be seal coated unless it is specifically required and approved by the University's Representative. AC fog coat shall not be used.

AGGREGATE SURFACING 32 15 00
PRODUCTS
Decomposed granite, size 1/4 inch minus, color gold/brown.

Header - Steel header size 3/16 inches thick by 4 inch deep. Black or green color. Stake supplied by header manufacturer. Manufacturer JD Russell Co, Joseph T. Ryerson & Son, Inc., or equal. Stakes shall be a minimum of 14 inches long or longer as required for solid anchorage.

Base - Aggregate base, class II.

Stabilizer: Non-toxic, organic binder that is colorless and odorless concentrated powder that binds decomposed granite together to produce a firm surface from Stabilizer Solutions, or equal.

EXECUTION
Headers - Provide headers at perimeter and at trees planted inside decomposed granite paving.

Placement - Equipment for mixing shall be batch type, using revolving blades or rotary drum. Install pre-mixed stabilized decomposed granite onto prepared subbase in a single 3 inch lift. Compact to a minimum 95 percent. Compact each area with at least 4 passes of compacting equipment. After compacting, screed smooth.

Tree Pockets - Provide 3 feet square header-edged tree pocket in decomposed granite, with stakes on tree pocket side of header. After tree planting has been accepted by University's Representative, fill with decomposed granite and screed level. Do not compact or add stabilizer within 3 feet square tree pocket.

PLANTING IRRIGATION 32 84 00
GENERAL
Landscape irrigation shall be connected to campus utility water system. When utility water is unavailable, connect to domestic water and provide a Reduced Pressure Backflow Preventer (RPBP) with flow sensor and gate valve at point of connection.
PRODUCTS
The following are manufacturers and products are approved for University landscape irrigation systems. Products of equal characteristics and performance may be submitted for approval.

1. Remote Control Valves
   - Rainbird: PESB series, GB series or BPES series
   - Irritrol 100 series
   - Toro 220 series or 220 brass

2. Pressure Regulating Electric Valves
   To be used on systems that require pumps, or for pressure reduction on spray systems not to exceed manufacturer’s recommendations.
   - Irritrol 103 series or Rainbird PESB/PRS series

3. Associated Valves
   - Y-Strainer brass 80 mesh with brass ball valve to blow-out screen
   - Above ground Y-strainers shall be metal
   - Y-strainer same size as water supply
   - Ball valves shall be brass (3 inch and larger); ball valves to be schedule 80 PVC for 2 inch and smaller.

4. Gate Valves - brass by Nibco, Aqua, or Matco

5. Quick Coupler Valves
   - Rainbird RC33, RC44 or Buckner B33, B44

6. Large Turf Heads
   - Hunter I-40S, I-42S, Toro 2001, or Rainbird 8005 or 7005

7. Medium Turf Heads
   - Hunter I-20S, ADS-36S or Toro EZ Adjust Series

8. Small Turf Heads
   - Rainbird 1804-PRS-SAM with brass or plastic nozzle, variable arc nozzles only to be used where angles are less than 90 degrees.
   - Or Hunter INST-04

9. Shrub Heads
   - Rainbird 1812-PRS-SAM or 1806-PRS-SAM with brass or plastic nozzles, Hunter INST-06, INST-12 or Hunter I-20-HP, I-20-6P for large areas.

10. Bubblers
    - Rainbird 1300 A – F with screens or Toro 500 Series

11. Pressure Lines
    - PVC Class 315 pipe with schedule 80 fittings (2-1/2 inch and larger)
    - PVC schedule 40 with PVC schedule 80 fittings on manifolds (2 inch and smaller)

12. Non-Pressure Pipe
    - PVC schedule 40 pipe and fittings

13. Controller
    - Wall mount for inside installations. Specify stainless steel pedestal cabinet for exterior installations. Include dome antenna within one mile of Grounds Division’s central computer. For greater than one mile, use high gain antenna. All controllers to be installed
with a radio and the proper UC Davis frequency of 485.075 MHz. If there are more than 48 stations on a site, the controllers may be hard wired together and would not need a separate radio or antenna.

14. Control Wiring
   Copper direct burial sprinkler wire sized according to length of run. Minimum 14 ga with white common, red primary lead and blue for spares. Run 5% extra wires for future valves at the ends of all main line runs. All communication wire for controllers and sensors to be installed in conduit no less than ¾ inch on runs less than 100 feet and 1 inch on runs greater than 100 feet.

15. Electrical Dry Connection
   Spears DS-400, pre-drilled dri-splice connector with crimp sleeves.

16. RPBF Devices (only if utility water is not available)

17. Valve Boxes
   One valve per box. Shall be Carson Model #1419 (or equal) for remote control valves. 10 inch round valve boxes for quick coupling and isolation valves Carson model #910 (or equal). Christy Concrete G5 traffic box for Main Valves with “Water” lid.

18. POC
   Point of connection - install Flow Sensor and Master Valve assemblies by Rain Master after brass gate valve (see item 13 above). The sizes of Master valve and Flow sensors to be line sized for project and have the capacity to have addition systems added on in the future.

19. Double Swing Joint Assembly
   For all sprinkler head installations use schedule 80 threaded nipples and risers and schedule 40 fittings. Acceptable premanufactured types are KBI Swing Joint Assembly or Spears Swing Joint Assemblies.

INSTALLATION

Unless otherwise noted, comply with requirements of Uniform Plumbing Code.
Connection to the water source shall be at a gate valve provided by others at the approximate location indicated on the plan. The Contractor shall be responsible for making the connection after the gate valve.

TRENCHING AND BACKFILLING

Provide the following cover over top of installed piping:
   1. Main Lines, 18" minimum.
   2. Lateral Lines, 12" minimum
   3. Piping under pavement, 24" minimum
   4. Sleeves, 18" minimum

Where trenching is required across existing lawns, provide the following:
   5. Uniformly cut strips of sod 6" wider than trench. Remove sod in rolls of suitable size for handling and keep moistened until replanted.
   6. Backfill to within 6" of finished grade. Continue fill with acceptable topsoil and compact to bring sod even with existing lawn.
7. Replant sod within 7 days after removal, roll and water generously.
8. Re-sod and restore to original condition any sod areas not in healthy condition equal to adjoining lawns 30 days after replanting.

TESTING & INSPECTION

Notify University's Representative and Grounds Division Representative in writing at least 48 hours before testing or inspections will be conducted. Conduct tests in presence of University's Representative.

Inspection schedule:
1. Layout of trench
2. Completed and cleaned trench
3. Completed piping
4. Pressure test for mainlines
5. Backfill and compaction
6. Coverage test
7. Final inspection

Notify University's Representative in writing at least 48 hours before testing will be conducted. Conduct tests in presence of University's Representative.

Hydrostatic Test
1. Test water main piping and valves before backfilling trenches, to a hydrostatic pressure of not less than 150 psi. Maintain 150 psi for two hours, no loss. Control valves and laterals to be tested at line pressure (but not less than 50 psi) for one hour, no loss.
2. Piping may be tested in sections to expedite work.
3. Remove and repair piping, connections, valves which do not pass hydrostatic testing. Retest after repair is made.

Operational Testing
1. Perform operational testing after hydrostatic testing is completed, backfill is in place, and sprinkler heads adjusted to final position, before any planting of landscape plants or sod.
2. Demonstrate to University's Representative that system meets coverage requirements and that automatic controls function properly.
3. Coverage requirements are based on operation of one circuit at a time.

AS-BUILTS/OPERATION MANUALS

At completion of project provide as-built drawings showing the locations and depths of the following items:
1. Connection to existing water lines
2. Connection to existing electric power
3. Ball valves/Isolation valves (ball valves)
4. Routing of sprinkler pressure lines
5. Sprinkler control valves
6. Routing of control wiring
7. Quick-coupling valves
8. Lateral lines & sprinklers
9. Controller Location

Contractor shall furnish two keys to controller in addition to reduced color coded drawing of sprinkler plan showing each area operated by a remote control valve. Chart shall be laminated in 4 mil plastic and securely attached to irrigation controller and inside lid or cover.

**PLANTING**

Soil Preparation - The top 12 inches of clean native soil shall be lifted and removed from all planting areas prior to general construction. Topsoil shall be stockpiled on site and used for landscaping. Place a minimum of 12 inches of clean topsoil in all planting areas. The next lower 12 inches of soil shall be cleared of all stones, stumps, debris, etc., larger than one half inch in diameter, that are brought to the surface as a result of cultivations. Cultivation shall be by rototilling or ripping equipment. Call Underground Service Alert (USA) before beginning cultivation operations.

Successful planting in the Davis area is limited to brief periods during spring and fall.

Labeling - Label all trees and 1 shrub of each variety with a securely attached waterproof tag bearing legible designation of botanical and common name, and cultivar.

Tree Stakes - Campus standard for tree stakes is Reddy Stake by Screw Tight Post Company, Turlock, CA. Nursery stakes shall be removed no later than the beginning of the maintenance period.

Tree Grates
1. Limit use to when no other planting option is available. Provide knockout sections allowing for tree growth.
2. Preferred Manufacturers: Urban Accessories, Model# Flat Rainbow; McKinley Tree Grate Co., Model# CR; or equal.
3. Apply black asphalt coating to concealed bottoms, sides and edges of cast iron units set in concrete.

Seed Mix - Provide fresh, clean, new-crop seed complying with tolerance for purity and germination established by Official Seed Analysts of North America. Provide seed mixture composed of grass species and proportions as specified.

Grass seed mix for most sunny areas is composed of:
- 20 percent Tophat Perennial Ryegrass
- 20 percent Cutter Perennial Ryegrass
20 percent Fiesta 3 Perennial Ryegrass
25 percent Cindy Creeping Red Fescue
15 percent Impact Kentucky Bluegrass

Grass seed mix for shady areas is composed of:
30 percent Cindy Red Creeping Fescue
30 percent Shadow Chewing Fescue
20 percent Victory Chewing Fescue
20 percent Spartan Hard Fescue

Sod - Sod type shall be closely matching above seed mixtures. Sod shall be well rooted and grown for the Central Valley climatic conditions. Overlap all joints.

Tree Standards -

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<th>Min. Caliper</th>
<th>Min. Ht. (in inches)</th>
<th>Max. Ht. (in feet)</th>
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** Measure 6 inches above root ball

**MAINTENANCE
Maintain trees, shrubs and other plants until final acceptance but in no case less than 60 calendar days after substantial completion and review of tree, shrub, ground cover, lawns and vine planting.
WARRANTY
All plant materials (1 gal. thru 15 gal.) shall be guaranteed for a period of 60 days, unless otherwise noted, following the end of the establishment period. If the end of the establishment period falls after October 1, the 60-day guarantee will begin the following spring, on March 15.

Trees larger than 15-gallon size shall be guaranteed for 1 year from the end of the establishment period. They shall be replaced if not in a healthy condition during this time.