

## **Division 13 00 50 – Landcare Requirements**

### **GENERAL**

1. The intent of this section is to inform the AE about specific requirements that are to be incorporated into the contract documents to provide direction and set expectations for the contractor as they mobilize on a project site to begin construction. In many cases the contractor has not had direction on how to deal with the exterior space in and around a construction site. This often results in damage to and/or destruction of important elements in the surrounding outdoor environment.
  
1. Where “Landcare” is mentioned it will have different contact points depending on the campus/location the work is taking place on. For the Twin City Campuses, this function resides in Facilities Management Landcare. For Crookston it resides in Facilities and Operations. For Morris it resides in Plant Services and Master Planning. For Duluth it resides in Facilities Management – Engineering Services. In all cases “Landcare” shall refer to the specific department/group/etc. that is responsible for the care and maintenance of the exterior grounds on that campus. The AE shall work with the Project Manager and the appropriate “Landcare” group to determine which requirements, listed below, pertain to the campus/location where the project will occur. Some requirements will vary depending in the facility location and the “Landcare” group that is charge of those facilities.
  
2. A/E of record shall insure that at a minimum the following requirements are fully incorporated into the project design and Contract Documents:

#### **A. CONSTRUCTION STAGING & TREE PROTECTION**

1. Contact Landcare at least one week prior to construction start to verify staging requirements on site.
  
2. Tree protection:
  - 2.1. Trees and landscape plantings shall be protected from damage unless noted that they will be removed.
  - 2.2. Using trees that are to remain for crane stays, guy anchors or other fastenings is prohibited.
  - 2.3. Lighting fires, storing materials, piling debris or excavated materials, or parking motorized equipment within the dripline of any tree is prohibited.
  - 2.4. Verify protection requirements with Landcare. Indicate protection requirements on the drawings. Specify protection to include the following:
    - 2.4.1. Install concrete highway traffic barriers or chain-link fencing around shrubbery and the outer perimeter of low-hanging tree branches.
    - 2.4.2. Shore and brace trees adjacent to open excavation to maintain soil around the root system.
    - 2.4.3. Where staging areas are approved to encroach into tree root zones, apply a 6 – 12” layer of woodchips or shredded wood mulch to minimize soil compaction from foot traffic, vehicles or equipment. For short duration or frequently changing equipment access or staging, use track mat sheets or a double layer of 3/4” plywood under wheels or tracks.
    - 2.4.4. Notify project manager and Landcare immediately of damage to trees – including tree-root systems. If any tree that is designated to remain becomes damaged by contractor operations, contractor shall replace it with the same caliper and species. If a replacement is not available, contractor shall reimburse the University in an amount equal to \$1,000 for each inch of diameter of the damaged tree, measured 48 inches above grade.

3. Tree Removal: The University shall designate which trees and shrubs shall be preserved, transplanted or removed. Coordinate with Landcare prior to the end of the Schematic Design phase.

4. Prevention of soil compaction: Apply a 6 – 12” layer of woodchips or shredded wood mulch in staging areas to minimize soil compaction from vehicles or equipment. Re-apply mulch as needed for longer duration projects. For short duration staging or frequently changing equipment access or staging, use track mat sheets or a double layer of ¾” plywood under wheels or tracks. Remove accumulated mulch at completion of project and restore site to pre-project conditions. Coordinate restoration with Landcare.

5. Irrigation protection: In most cases, irrigation mainlines will be located by the University’s utility locator. If construction activities will impact mainline, notify Landcare to coordinate irrigation outage. Cut and cap the mainline outside the limits of work to prevent debris from entering piping. If lateral line or heads are encountered during construction, cut or pull pipe out of the way, and notify Landcare. At completion of work, restore irrigation according to University Standards. Coordinate restoration with Landcare.

## **B. PUBLIC ART INSTALLATIONS**

1. Public art installations shall be subject to the same staging and restoration requirements as other University projects.

## **C. SUBGRADE PREPARATION, TOPSOIL AND FINISH GRADING**

1. Subgrade preparation requirements:

1.1. Before spreading topsoil, scarify the upper 18 inches of sub-grade to encourage vertical drainage and avoid perched water tables.

1.2. Verify that water percolates at a rate of 1” per hour or faster by conducting percolation tests. Verify number and location of tests with Landcare. Specifications for the tests are as follows: Drill a 4-inch diameter hole to a depth of 24 inches; pour 6 inches of gravel into the hole and cover it with water. Allow the water to drain for one hour and refill the entire hole with water. Water must drain out at the rate of 1 inch per hour or faster. If hardpan zones are encountered while drilling, a second test using a 4-inch diameter tube shall be conducted to verify vertical drainage. Submit percolation test results.

2. Topsoil material requirements:

2.1 Submit particle size gradation and soil fertility test results. Contractor assumes risk of topsoil replacement or amendment for topsoil placed prior to test result submittals.

2.2. Topsoil for irrigated areas is classified as sandy loam and has the following composition:

<b>Sieve size or material</b>	<b>% passing or % of composition</b>
#4 sieve	100
#10 sieve	80-90
#200 sieve	15-25
Silt	10-20
Clay	5-10
Organic matter	3-10

- 2.2.1. Silt:Clay ratio shall be 2:1 or less
  - 2.2.2. pH shall be minimum 5.5 and maximum 7.5, with 6 to 6.5 preferred.
  - 2.2.3. Maximum lead content shall not exceed 400 ppm for non-residential and non-childcare facilities. Maximum lead content for residential and childcare facilities shall not exceed 100 ppm.
- 2.3. Topsoil for non-irrigated areas – verify composition with Landcare.

3. Topsoil Placement:

- 3.1. Topsoil depth requirements: 4-inches for lawns, 12-inches planting beds.
  - 3.2. To establish a transition, blend the first 2 inches of topsoil into the top of sub-grade material.
  - 3.3. Perform finish grading and planting work when soil is dry.
  - 3.4. Remove rocks, sticks, roots, rubble and other debris from topsoil.
  - 3.5. Grade smooth and uniform surface with a minimum 2% slope away from buildings.
  - 3.6. Compact soil at edges of walks and drives to prevent settling resulting in trip hazards, and set finish grade 1” below adjacent pavement edges to minimize snow plow damage to lawns and plantings.
  - 3.7. Contact Landcare upon completion of grading for pre-sodding/pre-seeding inspection.
4. Remove from University property and legally dispose of all excess material, rocks and debris generated by landscaping operation.

**D. WALKWAYS**

- 1. Unit Pavers: Verify material and location of any proposed unit paver surfaces with Landcare prior to the end of the Schematic Design phase.
- 2. Design of sidewalk width and location shall be based on expected pedestrian volume and circulation routes. Adhere to the following guidelines:
  - 2.1. Sidewalks shall be a minimum clear width of 7 feet unencumbered by signs, light poles and other obstructions. In order to minimize hard-surface area, maximum width shall be designed to accommodate normal pedestrian loads.
  - 2.2. Provide angled or radius transitions at all sidewalk intersections of 120 degrees or less to minimize foot traffic through landscaped areas.
  - 2.3. Due to foot traffic, service vehicle parking and winter damage to grass boulevards, Landcare prefers sidewalk placement adjacent to curbs without a boulevard. If boulevards are constructed, minimum boulevard width (between curb and sidewalk) shall be 8’. Review sidewalk alignment with University Landcare.
  - 2.4. Replacement sidewalks shall match adjacent sidewalks in width, jointing pattern and finish.
  - 2.5. Concrete sidewalks shall be non-reinforced and a minimum of 5 inches thick.
  - 2.6. Use of asphalt pavement for permanent sidewalks is prohibited.
  - 2.7. Asphalt surface on roadways, driveways and parking areas shall be a minimum thickness of 3 inches. The A/E shall consult with a civil engineer to design and specify actual lift thickness for pavement and base. The lift thickness shall be based upon projected vehicle traffic and in accordance with MN DOT Standard Specifications for Construction.
  - 2.8. University of Minnesota-Duluth allows for bituminous sidewalks in low-visibility, non-academic areas such as around sports fields, recreational areas, campus parking lots in outlying areas and back entrances/fire lanes for auxiliary buildings. Any bituminous surface used for a sidewalk shall be built to low-volume roadway specifications.
  - 2.9. Trees planted within paved areas require structural soil quantities sufficient to support the species selected.
  - 2.10. Tree grates are discouraged due to maintenance and safety issues. In some cases, tree grates will be accepted. Review proposed locations with Landcare.

- 2.11. Review design of sidewalks within Minneapolis street right of way with City of Minneapolis Public Works Department. Contractor must notify Public Works staff before pouring concrete in order to coordinate street sign collar locations.

## **E. SITE FURNITURE**

1. To provide continuity throughout the campus, and efficient maintenance and operations, site furniture shall be purchased through University Landcare. The designer shall indicate placement and quantity of furniture in the contract documents. The contractor shall install the owner-supplied furniture. The project manager and Landcare must approve any deviation from University Site Furniture standards.
3. Bike Racks: To provide continuity throughout the campus, provide Dero Racks, Inc., Swerve model bike racks or university-approved equal. Coordinate quantity and location of bike racks with Landcare and Parking and Transportation Services.
4. Refer to Division Twenty-Six, Section 265600- Exterior Lighting for University standard exterior light fixtures, poles and base standard requirements.

## **F. LANDSCAPE IRRIGATION**

1. All landscaped areas, including parking facilities, shall have an automatic landscape irrigation system.
2. In order to standardize watering practices and promote water conservation, the University has invested in a centrally controlled, ET based irrigation system for the campus. All new irrigation systems must be designed for compatibility with the Toro Sentinel system.
3. Subsurface watering products will be evaluated by Landcare on a case by case basis.
4. Irrigation systems shall include the following components:
  - 4.1. Water supply:

Specify approved back-flow prevention device and deduct meter. Review water supply size with Landcare to ensure capability of future system expansion. If backflow prevention device is located outside, an enclosure is required. Coordinate meter installation and enclosure requirements with Landcare and the municipal water department.
  - 4.2. Main Line:

Specify Class 160 PVC irrigation main line. Main line depth to be 12-18" below finished grade. Pipe-pulling for main line installation prohibited.
  - 4.3. Exterior Shut-off:

Specify an exterior shut-off valve adjacent to the water source location for emergency system shut-down. Verify additional isolation valve quantity and location with Landcare.
  - 4.4. Exterior Winterization Connection Point:

Specify 1" quick-couple for winterization connection point within 2' after exterior shut-off.
  - 4.5. Master Valve:

Specify Hunter PGV series valve. Valve size to match main line size.
  - 4.6. Flow Sensor:

Specify Data Industrial flow sensor with dummy plug. Install per mfr's requirements.
  - 4.7. Flow Sensor Wire:

Specify 20 gauge twisted pair shielded cable wire. Install per mfr.'s requirements.
  - 4.8. Controller:

- Specify Toro Sentinel wall-mounted controller on building exterior. Verify controller location with Landcare. Verify use of 2-wire decoder system with Landcare.
- 4.9. Ground plate:  
Specify Paige #182199 plate with #6 bare copper wire. Install per mfr's requirements.
- 4.10. Valves:  
Specify Hunter PGV series valves for zone and master valves. Hunter PGV Jar-Top preferred for 1" valve installation.
- 4.11. Lateral Line:  
Specify 1" or 1-1/4" polyethylene pipe. Lateral line depth to be 8-12" below finished grade.
- 4.12. Heads:  
Specify Hunter heads except as follows; specify Toro 570 series heads in lieu of Hunter spray heads.
- 4.13. Control Wire:  
Multi-strand wire is prohibited when PULLED in runs LONGER than 100 feet. Specify minimum 14-gauge solid-copper for wiring pulled in runs over 100 feet in length.
- 4.14. Wire Nuts:  
Specify direct burial wire nuts for buried wire splices. Specify waterproof wire nuts for wire splices in valve boxes.
- 4.15. Quick Couples:  
Specify 1" quick-couples and keys for hand watering, Toro 474 or compatible. Verify quantity and locations with Landcare.
- 4.16. Boxes:  
Specify NDS Pro Series for all boxes. Set box flush at grade and prevent boxes from sitting on pipe.
- 4.17. Submittals:  
Specify submittal of hard copy and AutoCAD compatible As-Built Plan upon completion of project. Refer to Division 1, Section 017700 - Contract Closeout: Submittals.
- 4.18. Warranty:  
Specify a one-year warranty period including one fall blow-out and one spring start-up.

## **G. PLANTINGS**

1. All plant material shall meet the requirements of the most recent edition of American Standard for Nursery Stock of the American Association of Nurserymen, Inc. regarding size, grade and quality. To meet the University's commitment to provide a selection of plant material on campus for academic purposes, no substitutions of specified plant material sizes, grades, species, qualities or forms shall be made without written permission from the project manager.
2. The University will not accept trees that are planted too deep. Plant trees and shrubs so that the first true root is within one inch of finish grade. Prior to planting, remove soil from top of the root ball as needed to expose first true root. Reject any nursery stock received with more than 4" of soil covering the first true root. Landcare may inspect plantings to verify planting depth.
3. Planting depth of small container stock shall be such that the top of the mulch surface shall be flush w/ the top of the root mass. Review planting details with Landcare.
4. Unless beds are mass excavated and backfilled with prepared planting soil, the radius of individual planting holes shall be a minimum of 12 inches larger than the radius of the root ball for trees and 6" inches larger for shrubs. The bottom of the planting hole shall be undisturbed or compacted soil, slightly crowned. For B&B stock, remove burlap, twine, wire, etc. from the upper one-third of the ball.

5. Weed barrier fabric or landscape fabric is prohibited in planting beds.

## **H. MULCH AND EDGING**

1. Mulch shall be 100% shredded hardwood, tub-ground to medium/fine texture, including no pieces larger than 4" in any dimension, and free of deleterious materials. Apply to a uniform depth of 3 inches. Do not place mulch against tree trunks or bury shrub branches or crowns with mulch.
2. Alternative mulch materials must be approved by Landcare.
3. Gravel, rock, or other inorganic mulches are prohibited in planted areas.
4. Bed edges shall be straight lines or smooth flowing curves. Irregular bed edges will not be accepted. Cut bed edges are preferred to edging. If edging is used, specify 3/16" thick steel with an interlocking metal stake system.

## **I. SODDING & SEEDING**

1. Sod Material: Specify ASPA/TPI certified nursery grown sod, free of stones, with a strong fibrous root system and a maximum of 5 weeds per 1,000 SF. To conserve water, Landcare encourages the use of low-impact sod varieties. Review sod species and variety with Landcare.
2. Sod installation:
  - 2.1. Remove all undesirable plant material in areas to receive sod, seeding or planting.
  - 2.2. Contact Landcare to approve grading prior to placing sod.
  - 2.3. Lay sod so that adjacent strips butt tightly with no space between strips. Stagger strips. Areas with sod shall match the grade of adjoining turf, sidewalks, curbs and/or seeded areas. Provide smooth transitions to match existing grade where sod work interfaces existing conditions.
  - 2.4. To minimize snowplow damage, ensure that soil is firm, and grade is one inch below top of adjacent walkways, extending 6 to 12 inches horizontally away from walk.
  - 2.5. Cut tree rings in an even, circular fashion at a distance of 18 inches from the base of trees. Jagged or irregular bedlines will not be accepted.
  - 2.6. Immediately after sod has been laid, irrigate it thoroughly. Sod will be considered substantially complete when the sod is thoroughly knitted to the soil.
  - 2.7. Remove excess soil, rocks, and debris. Clean mud, soil, and other debris from walks, lots, and adjacent areas before leaving the site.

3. Seed: review seed mix and application requirements with Landcare.

## **J. MAINTENANCE AND ACCEPTANCE**

1. Sod: Water regularly to ensure root development. Do not over water; soil beneath sod should be damp, but not soaking wet. Mow sod until accepted to maintain a maximum height of 3". Remove any piles or windrows of clippings from lawn areas to avoid killing grass. The contractor is responsible for watering and mowing for a minimum of 30 days unless notified by Landcare.
2. Trees, Shrubs and perennial plantings: Water, mulch, straighten, re-set, raise, stake, etc. as needed until accepted by the project manager and Landcare. The contractor is responsible for watering for a minimum of 30 days unless notified by Landcare.
3. Irrigation: Demonstrate operation of completed system to Landcare.

4. Warranties: All plant materials for one year from date of acceptance; All irrigation parts for 60 days of consecutive operation.

END OF DIVISION 130050 - LANDCARE REQUIREMENTS