

NC State University Design and Construction Guidelines

Division 32 – Exterior Improvements – Plants, Turf Grass, and Soil Preparation

1.0 Purpose

These guidelines are for the use of all Campus landscaping.

2.0 General Requirements

1. Native trees and shrubs appropriate for this region are strongly preferred. The university has a do not plant list used to guide the design process. Contact NC State for the current list.
2. Native plants shall be used in natural areas and within the Neuse River Buffer.
3. Chemical applications require the submittal of a detailed list, a copy of the applicator's license and MSDS data sheets.
4. Cultivated varieties of plants are limited to campus and building entrances, outdoor seating areas, and along the All Campus Path.
5. Annual planting beds shall not be used.
6. Foundation plantings shall be planted so that at maturity, there is three feet between the building face and the shrubs and trees.
7. An 18-inch wide maintenance strip with 1/8" minimum metal edging of 1-3" diameter glacier jax is required at the base of the building where earth meets the building base.
8. Plant material over three feet in height at maturity shall be ten feet back from the edge of walkways. Root barriers shall be used where trees are less than ten feet from paved areas, to protect pavement.
9. All Large Shade trees planted shall be coordinated with pedestrian and street lighting
10. Plant material at maturity shall not extend over roofs.
11. Each large tree shall have a six-foot diameter minimum mulch ring.
12. Locate trees in groupings within a continuous mulch bed where possible.
13. Parking lot plantings shall be in accordance with the City of Raleigh landscape requirements located in the Unified Development Ordinance.
14. Landscape and site design shall preserve existing trees to the maximum extent possible.

NC State University Design and Construction Guidelines

Division 32 – Exterior Improvements – Plants, Turf Grass, and Soil Preparation

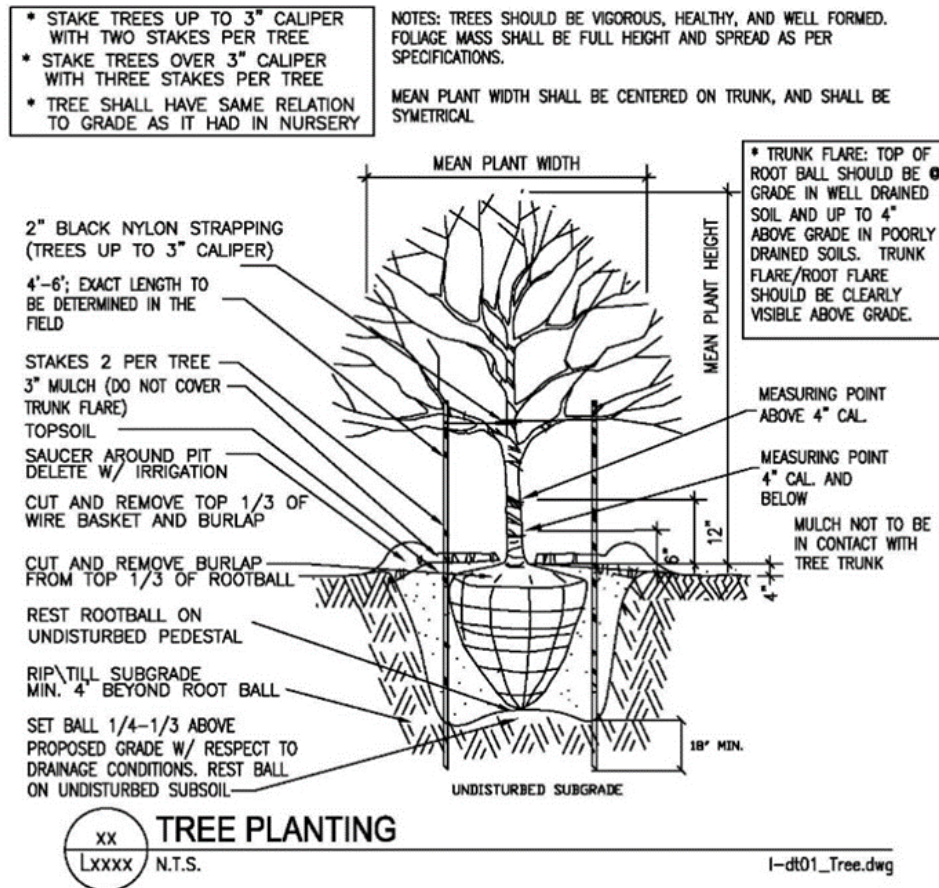
15. Any individual tree or group of trees removed due to campus construction, shall be replaced with a minimum caliper of 3 ½” measured at Dimensions at Breast Height (DBH), at a rate of one-to-one with a similar or approved species by owner.
16. All projects near existing Heritage Trees are required to contact the University Arborist.

3.0 Materials & Standards

1. All plants must conform to the current American Nursery Standards for Nursery Stock published by the American Association of Nurserymen.
2. Trees must be offset a minimum of ten feet from underground utility infrastructure. Owner must approve any exceptions. Water and sewer easements are twenty feet wide unless specified otherwise.
3. Trees specified within 10 feet of utilities, and owner approved, root barriers shall be used to minimize impact to utilities.
4. Mulched areas identified in the construction documents shall use triple shredded hardwood mulch. It shall be well-composted, shredded hardwood with a maximum particle size of three inches, and free of waste materials.

NC State University Design and Construction Guidelines

Division 32 – Exterior Improvements – Plants, Turf Grass, and Soil Preparation



5. All packaged materials, including fertilizer, shall arrive to the project site in the original unopened, undamaged containers showing weight, analysis, and the name of manufacturer. All packaged material shall be covered and protected from deterioration until used.
6. All plants must be sound, healthy, and vigorous, free from defects, disease, and all forms of infestation. All plants shall have a fully developed form without voids and open spaces. Plants held in storage will be rejected if they show signs of growth during storage.
7. Tree species that develop a "Y" shape at maturity are unacceptable and will be rejected.
8. Trees and shrubs shall not be pruned prior to delivery to the project site. After delivery is accepted, pruning is acceptable only to remove broken branches.

NC State University Design and Construction Guidelines

Division 32 – Exterior Improvements – Plants, Turf Grass, and Soil Preparation

9. No other pruning is allowed at planting unless approved by the University Arborist.
 10. Pruning wounds exceeding a diameter of one inch are unacceptable. Wounds must show vigorous bark on all edges.
 11. Trees and shrubs shall not be bent or tie-bound in such a way to damage the leader or bark.
 12. Ball and Burlap plants with cracked and/or loosen or broken root balls will be rejected.
 13. Container grown stock will be rejected if root bound.
 14. Staking shall be removed by the Contractor at the end of the warranty period or as directed by NC State.
- A. Certification of Grass Seed:
1. Text Package shall state botanical and common name, percentage by weight of each species and variety, percentage purity, germination, and weed seed.
 2. Seed shall be fresh, clean, dry, new crop seed complying with AOSA's "Journal of Seed Technology; Rules for Testing Seeds" for purity and germination tolerances within inspection date no more than three months prior to application.
 3. Seed must be at minimum 85% germination, and 95% pure seed. Seed exceeding 0.5 percent weed seed is unacceptable..
 4. For seeding, a starter fertilizer of 18-24-12 at three quarters of a pound of Nitrogen per 1,000 sq. ft. shall be used.
 5. Seeding New Lawns: Seeding rate shall achieve 90% coverage prior to acceptance and will be determined on a per square yard basis.
 6. When Hydro-Seeding is used, adjacent areas must be protected from overspray.
 7. Seeded areas that achieve less than 90% coverage shall be replaced.
- B. Certification of Sod:
1. The sod source must be identified with name, address and telephone number of supplier. Sod must comply with TPL's "Specifications for Turf grass Sod Materials" in its "Guideline Specifications to Turf grass sodding".
 2. Sod must be viable, of uniform density, color, and texture and strongly rooted at a minimum of ½". It must be capable of vigorous growth and development.

NC State University Design and Construction Guidelines

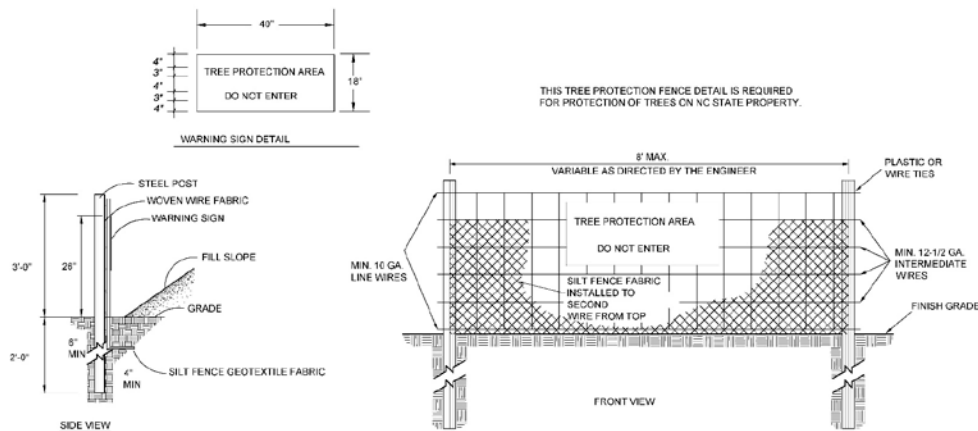
Division 32 – Exterior Improvements – Plants, Turf Grass, and Soil Preparation

C. Soil Amendment and Fertilizers:

1. Contractor shall submit manufacturer's product certificates.
 - a) The amendments shall be incorporated into the top 3 inches of the soil prior installation of sod, sprigs or seed.
 - b) All areas with plant material shall follow the soil analysis report for recommendations on lime and fertilizer.
 - c) For a sodded area, a starter fertilizer of 18-24-12 is required at the rate of half a pound of Nitrogen per 1,000 sq. ft. before sod is laid.
 - d) For a seeded area, a starter fertilizer of 18-24-12 at the rate of three quarters of a pound of Nitrogen per 1,000 sq. ft. shall be used.

D. Tree Protection:

1. All construction activities are prohibited in tree protection areas, unless approved by NC State.
2. The Contractor shall adhere to curb and gutter demolition, and sidewalk demolition detail included in this document during removal when removal is adjacent to protected trees.
3. All trees and/or groups of trees identified for protection shall be protected per details



MAINTENANCE: CLEAN OUT AT 50% CAPACITY
LIFE OF FENCING: 6-9 MONTHS

NOTES:

1. WARNING SIGNS TO BE MADE OF DURABLE, WEATHER-PROOF MATERIAL.
2. LETTERS TO BE 3" HIGH MINIMUM, IN BOTH ENGLISH AND SPANISH CLEARLY LEGIBLE AND SPACED AS DETAILED.
3. PLACE A SIGN AT EACH END OF LINEAR TREE PROTECTION AND 50' ON CENTER THEREAFTER.
4. FOR TREE PROTECTION AREAS LESS THAN 200' IN PERIMETER, PROVIDE NO LESS THAN ONE SIGN PER PROTECTION AREA.
5. ATTACH SIGNS SECURELY TO FENCE POSTS AND FABRIC.
6. MAINTAIN TREE PROTECTION FENCE THROUGHOUT DURATION OF PROJECT.
7. ADDITIONAL SIGNS MAY BE REQUIRED BY NC STATE BASED ON ACTUAL FIELD CONDITIONS.
8. FLOW SHALL NOT RUN PARALLEL WITH THE FENCE.
9. END OF SILT FENCE NEEDS TO BE TURNED UPHILL.

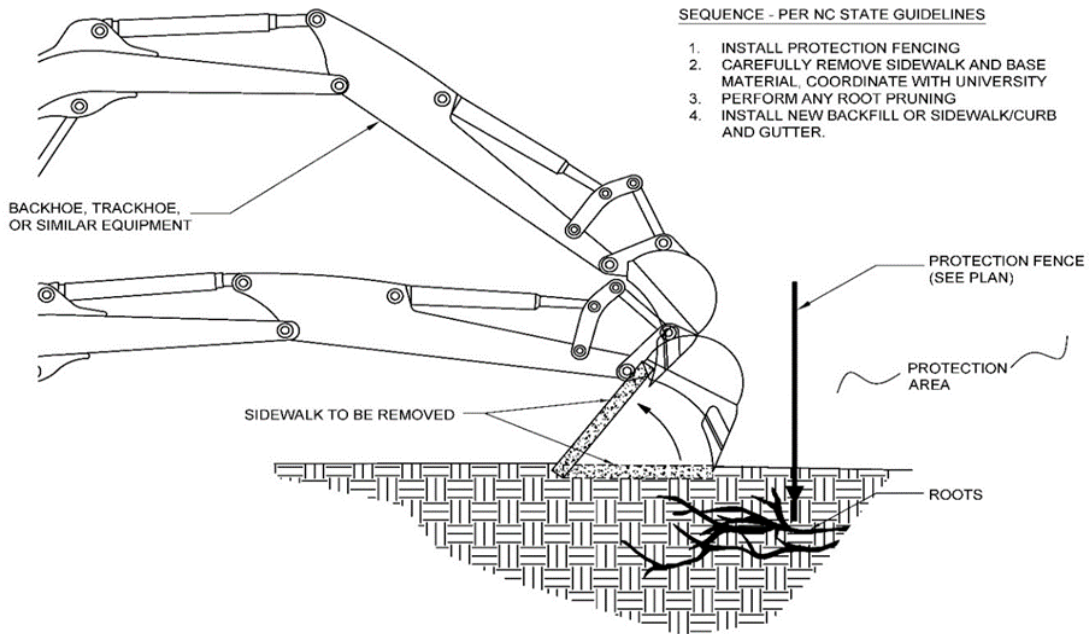
NC State University Design and Construction Guidelines

Division 32 – Exterior Improvements – Plants, Turf Grass, and Soil Preparation

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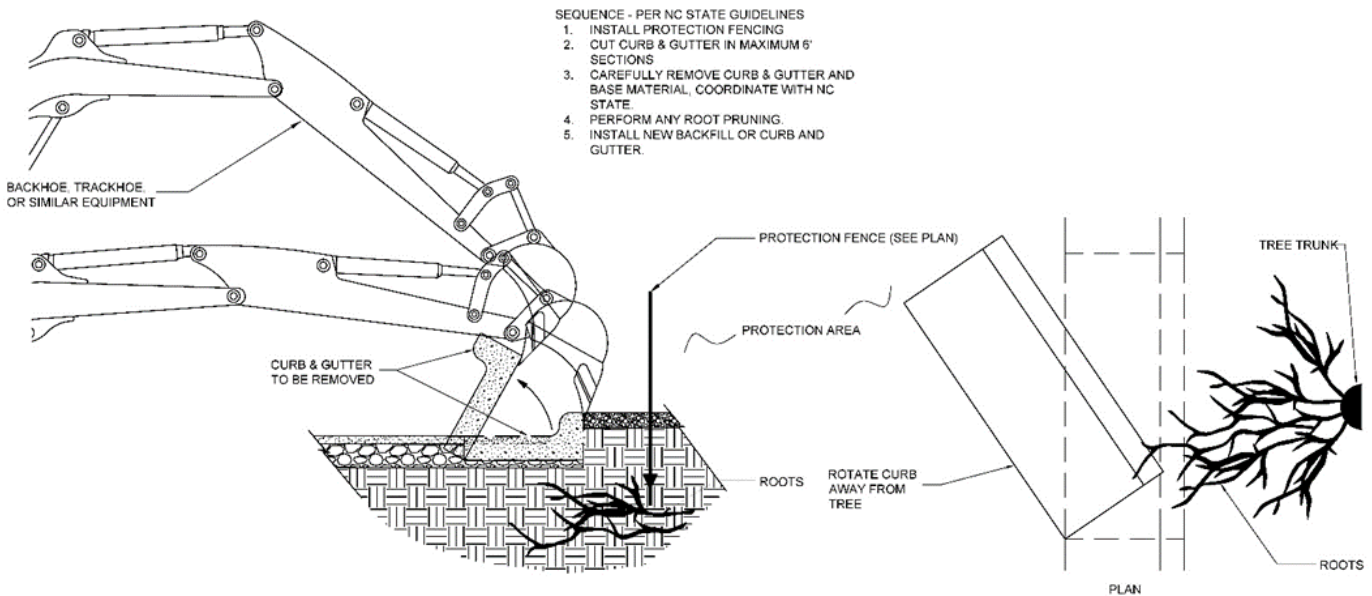
NC State University Design and Construction Guidelines

Division 32 – Exterior Improvements – Plants, Turf Grass, and Soil Preparation



XX
LXXXX 3/8" = 1'-0"

SIDEWALK DEMOLITION AROUND EXISTING TREE ROOTS



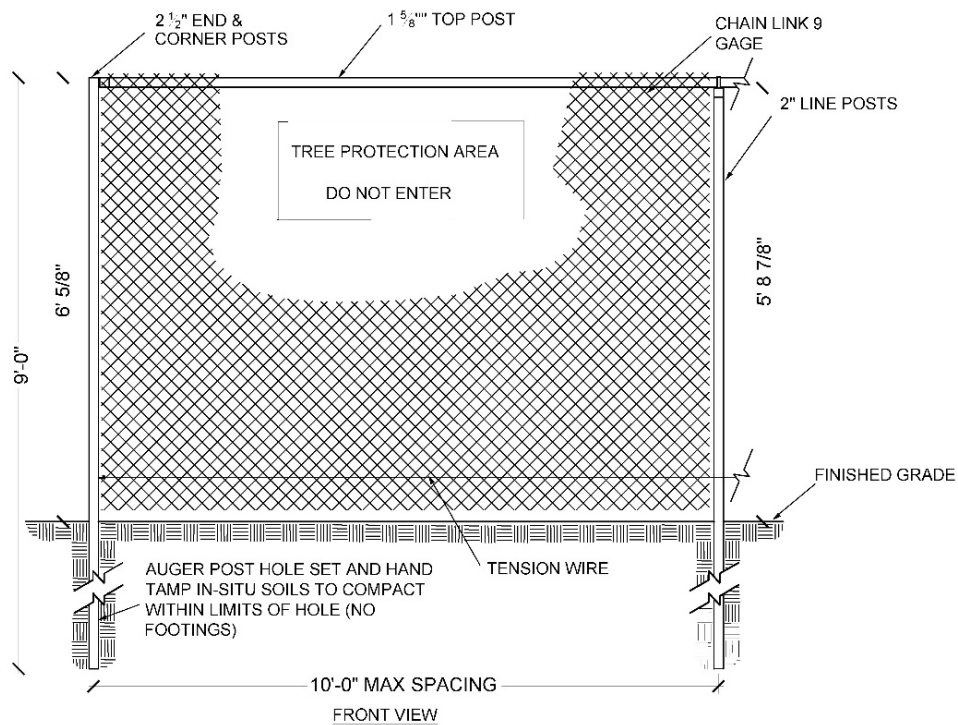
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LXXXX 3/8" = 1'-0"

CURB DEMOLITION PROCEDURE TREE ROOTS

NC State University Design and Construction Guidelines

Division 32 – Exterior Improvements – Plants, Turf Grass, and Soil Preparation

4. Trees identified as Heritage Trees shall require enhanced tree protection using chain link fencing for tree protection per detail included in this document.
5. NC State shall provide an electronic copy of the Heritage tree location impacted by project. Contact Grounds Management for database.



CHAIN LINK FENCING PRODUCT DATA:

PRODUCT: GALVANIZED STEEL CHAIN LINK FABRIC ON GALVANIZED STEEL FRAMEWORK

NOTE: CONTRACTOR TO PROVIDE GALVANIZED STEEL CHAIN LINK GATE WITH GALVANIZED STEEL FRAMEWORK AND LOCKING MECHANISM AT EACH ENCLOSURE. TREE PROTECT SIGN SHALL BE IN ENGLISH AND SPANISH.

XX
LXXXX 3/8" = 1'-0" **ENHANCED TREE PROTECTION FENCING**

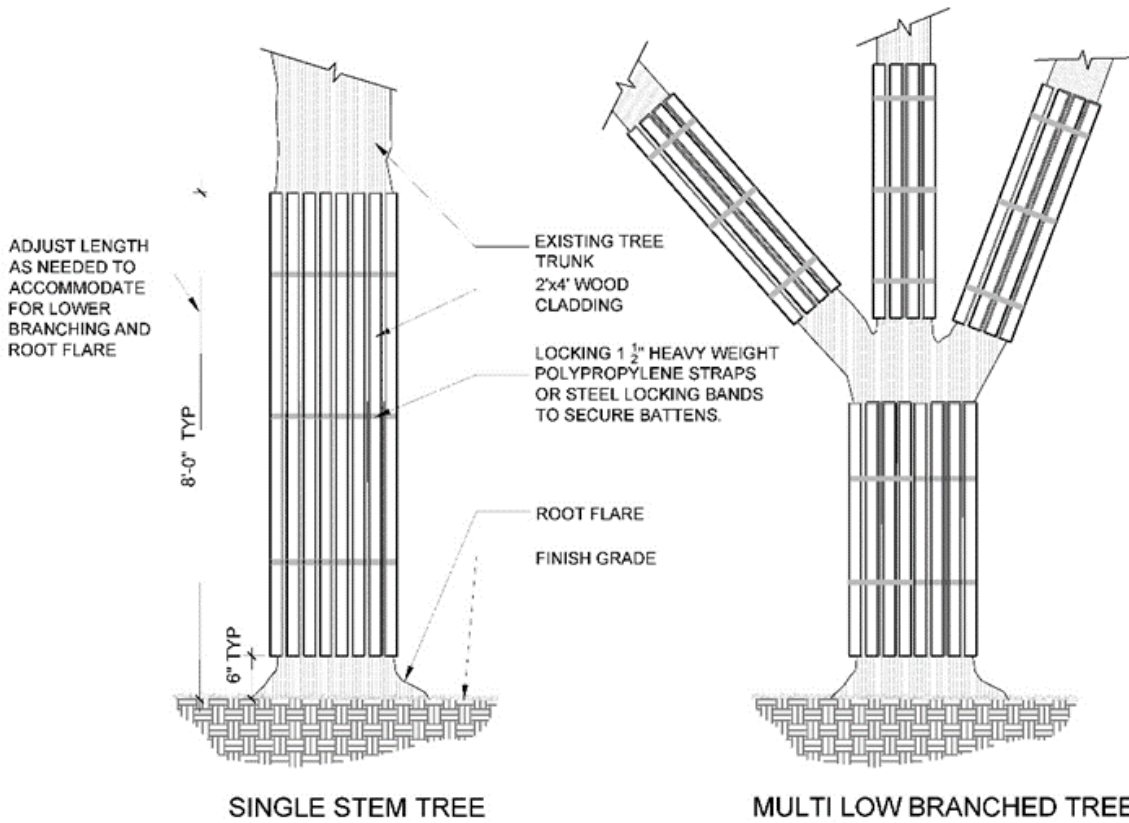
NC State University Design and Construction Guidelines

Division 32 – Exterior Improvements – Plants, Turf Grass, and Soil Preparation

6. In addition to required tree protection fencing and where construction equipment may impact trees, battens are required per detail included in this document.
7. Tree Protection must be shown on demolition, grading, and erosion control plan sheets.
8. Trees to be preserved must be labeled as such on all pertinent site plans, including but not limited to, demolition, layout, and all utility, grading, and planting plans.
9. If construction occurs within the critical root zone of a protected tree, outside of the limits of the tree protection area, a 12” layer of mulch, or logging mats, or nylon protection shall be installed over the impacted area prior to construction activities, but not located within the limits of work where machinery maneuvering will compact soils

NC State University Design and Construction Guidelines

Division 32 – Exterior Improvements – Plants, Turf Grass, and Soil Preparation



NOTE:

1. THERE WILL BE NO PERMANENT PHYSICAL ATTACHMENT OF BATTENS TO EXISTING TREE (INCLUDING NAILS, SCREWS, OR MECHANICAL FASTENERS).
2. ALL BRANCHES GREATER THAN AND EQUAL TO 6" CALIPER, SHALL HAVE BATTENS.

XX
LXXXX 3/8" = 1'-0"

TREE PROTECTION BATTEN

NC State University Design and Construction Guidelines

Division 32 – Exterior Improvements – Plants, Turf Grass, and Soil Preparation

E. Pruning:

1. The Contractor shall not remove or prune any landscape materials without prior consent from NC State.
2. All tree work above and below grade shall be approved by an arborist certified by the International Society of Arboriculture, who is bonded, and insured per NC State requirements.
3. All work shall be according to standards set forth in the ANSI A300 publication “Pruning Standards for Shade Trees”.

4.0 Watering and Irrigation

1. Irrigated areas shall meet the specifications with the university’s current “Rain Bird IQ” irrigation software.
2. Irrigated areas shall be limited to lawn and/or plant areas between the curb and sidewalk, medians, campus entrances, and prominent edges, large expanses of lawn in courtyards, and all play fields.
3. The irrigation design shall ensure that no paved surfaces get wet. Turf irrigation shall be on separate zones from other plant irrigation.
4. All new plantings shall be watered a minimum 1” per week for the first growing season or until established.
5. All trees shall use gator bags (or equivalent) for all tree installation and shall be applied to the trunk and sit vertically when full. Where branching is less than twenty-four (24) inches above grade, use a water absorbing polymer product to supplement watering.
6. An Irrigation plan shall be submitted for approval to NC State prior to installation.
7. Any installation that ties to an existing water reuse line will require adherence to City of Raleigh regulations and guidelines.

5.0 Installation

F. Location of Plants on Site:

1. The Contactor must field stake the position of specimen trees for the Designer to review and approve prior to planting.

NC State University Design and Construction Guidelines

Division 32 – Exterior Improvements – Plants, Turf Grass, and Soil Preparation

2. Trees and shrubs shall be delivered and planted within six hours after planting preparations have been completed. If planting is delayed more than six hours, set plants in the shade, protect from weather and mechanical damage, keep roots moist, prevent freezing of root ball, and remove ties from branches.
3. The storage area must be watered prior to placing plants on it. Plants, especially tree trunks, must be protected from strong direct or reflected light.
4. Each individual plant must be watered immediately after planting. The Contractor is responsible to keep the plant root zone moist.

G. Planting:

1. Planting pits for Ball and Burlap material must be two times the width of the root ball or container.
2. Excavation depth must allow the Ball and Burlap root ball to be two to three inches above original grade.
3. For container grown plants, set plants on undisturbed soil two to three inches – confirm top of root ball is 1/3 above original grade.
4. The excavation backfill must use amended soil, tamped to remove air pockets. Ball and Burlap plants must have the upper third burlap, wire, rope and/or straps removed after the plant is partially backfilled and stable.
5. If additional soil is required for backfilling, use soil similar to the top soil of the surrounding area. Any imported soil must be approved by NC State.
6. A saucer shall be built around the top of the root ball, one foot beyond the plant pit. Finished height of the completed saucer must be four inches for Ball and Burlap plants as well as container plants five gallons and larger, and two inches for container plants smaller than five gallons.

H. Mulching:

1. Saucers and all mulched plant beds require mulch depth of three inches. Mulch must not be placed within six inches of plant base. The minimum mulch ring for any single plant is five feet in diameter.
2. Sloped mulched planting beds that equal or exceed 3:1 require biodegradable matting.

I. Lawns:

NC State University Design and Construction Guidelines

Division 32 – Exterior Improvements – Plants, Turf Grass, and Soil Preparation

1. Soil must be rolled to flat prior to installation of sod.
2. Sod must be laid with no gaps; ends and sides to be butted, not stretched or overlapped. Sod strips or pads must be staggered to offset joints in adjacent courses.
3. On slopes exceeding 3:1, sod must be laid across the angle of the slope Pin 50% of the area.
4. Sod must be rolled to achieve contact with sub-grade.
5. Sod shall be and watered at a minimum of 1” inch per week until established.
6. Gaps resulting from trimmed pieces in a warm season lawn shall be dressed with double washed sand.
7. Sod must be laid within twenty-four (24) hours of delivery.
8. All newly planted areas shall be cordoned off with 18” high wooden stakes strung with yellow nylon rope until lawn is established.

J. Mowing:

1. Grass must be fully established prior to initial mowing.
2. Specified grass height must be maintained without cutting more than 1/3 of grass blade. Mowing schedule must accommodate this requirement.
3. The directional mowing pattern must be rotated with every mowing cycle.
4. Mowing cannot occur when grass is wet.

6.0 Warranties

1. Maintenance and protection of the work is the responsibility of the contractor until Final Acceptance.
2. Maintenance consists of mowing, watering, cultivation, weeding, mulching, resetting of plants to proper grades or upright positions, keeping the plants free of insects and disease and in thriving condition.

NC State University Design and Construction Guidelines

Division 32 – Exterior Improvements – Plants, Turf Grass, and Soil Preparation

3. The warranty requires that plants be healthy, vigorous, and thriving for twelve months from the date of Final Acceptance. Dead or dying plants will be documented and removed immediately by the Contractor.
4. Final Acceptance: After Final Acceptance, NC State will assume all maintenance of plant material of the site. Exceptions include the Contractor responsibilities for watering as defined in the warranty period (sec. 4.01). Materials & Standards.

END OF SECTION