SECTION 329300 - PLANTS

GENERAL

1.1 SUMMARY

A. Section Includes:
1. Trees.
2. Shrubs.
3. Ground cover.
4. Annuals, Perennials, and Vines.

1.2 DEFINITIONS

A. Backfill: The earth used to replace or the act of replacing earth in an excavation.

B. Finish Grade: Elevation of finished surface of planting soil.

C. Manufactured Topsoil: Soil produced off-site by homogeneously blending mineral soils or sand with stabilized organic soil amendments to produce topsoil or planting soil.

D. Planting Soil: Native or imported topsoil, manufactured topsoil, or surface soil modified to become topsoil; mixed with soil amendments.

E. Root Flare: Also called “trunk flare.” The area at the base of the plant’s stem or trunk where the stem or trunk broadens to form roots; the area of transition between the root system and the stem or trunk.

F. Subgrade: Surface or elevation of subsoil remaining after completing excavation, or top surface of a fill or backfill, before placing planting soil.

G. Subsoil: All soil beneath the topsoil layer of the soil profile, and typified by the lack of organic matter and soil organisms.

1.3 SUBMITTALS

A. Submit all product submittals twelve (12) weeks prior to delivery and installation of plantings, including any plant substitutions.

B. Product Data: For each type of product indicated.

C. Affidavit: From nursery certifying that furnished trees meet the requirements specified under Section 2.1.

D. Plant sources: Provide the following for each submitted source:
   1. Nursery name and location
   2. List of the plants to be provided from the source. The plant list shall include the botanical and common name and the size at the time of selection.
   3. Color photographs of representative sample of each plant. Photographs shall be legible and contain a clearly legible height reference, such as a measuring stick.

E. Planting Schedule: Indicating anticipated planting dates for each type of planting.

F. Maintenance Instructions: Recommended procedures to be established by Owner for maintenance of exterior plants during a calendar year.

G. Plant Substitutions for plants not available:
   1. Submit all request for substitutions of plant species, or size to the Owner's Representative, for approval, prior to purchasing the proposed substitution.
   2. Provide documentation of the plant suppliers contacted to substantiate unavailability.
   3. Request for substitutions shall conform to all requirements described in Part 1.4.D of this specification.
   4. Requests shall also include sources of plants found that may be of a smaller or larger size, or a different shape or habit than specified, or plants of the same genus and species but different cultivar origin, or which may otherwise not meet the requirements of the specifications, but which may be available for substitution.
   5. Requests for substitution shall be of equal value.
      a. If substitution involves additional cost or credit, contractor shall indicate such in the substitution request.
      b. Owner and Landscape Architect must approve all additional costs or credits prior to procurement.

H. Soil Analysis: Conforming with requirements described in Part 1.4.C

1.4 QUALITY ASSURANCE

A. Installer: A North Carolina Registered Landscape Contractor which has at least five (5) years experience in work of the size and type required by this section and which is acceptable to the Landscape Architect and Owner's Representative.
   1. References: Submit three letters of reference from owner's representatives for projects completed in the past 5 years of similar scope and dollar value, including names and phone numbers of contact person(s).

B. Installer's Field Supervision: Require Installer to maintain an experienced full-time supervisor on Project site when planting is in progress.

C. Topsoil Analysis: Furnish soil analysis by a qualified soil-testing laboratory.
   1. Report suitability of topsoil for plant growth. State-recommended quantities of nitrogen, phosphorus, and potash nutrients and soil amendments to be added to produce satisfactory topsoil.
   2. A subsequent report of the planting soil once the laboratory recommended soil amendments are added. Updated state-recommended quantities of nitrogen, phosphorus, and potash nutrients and soil amendments to be added should the tested planting soil not meet requirements.

3. Continue to provide soil test reports following application of recommended soil amendments until a report demonstrates compliance with soil requirements and is approved by Landscape Architect.

D. Provide quality, size, genus, species, and variety of exterior plants indicated, complying with applicable requirements in ANSI Z60.1, "American Standard for Nursery Stock."

1.5 DELIVERY, STORAGE, AND HANDLING

A. Do not prune trees and shrubs before delivery. Protect bark, branches, and root systems from sun scald, drying, sweating, whipping, and other handling and tying damage. Do not bend or bind-tie trees or shrubs in such a manner as to destroy their natural shape. Provide protective covering of exterior plants during delivery. Do not drop exterior plants during delivery and handling.

B. Handle planting stock by root ball.

C. Deliver exterior plants after preparations for planting have been completed and install immediately. If planting is delayed more than six hours after delivery, set exterior plants and trees in shade, store in a vertical position, protect from weather and mechanical damage, and keep roots moist.

D. Plants that are compromised or damaged during delivery, storage, and handling shall be replaced with healthy equivalent that meet or exceed the standards outlines in Part 2.

E. At time of observations and delivery, the root ball shall be moist throughout. Roots shall not show signs of excess soil moisture conditions as indicated by stunted, discolored, distorted, or dead roots.

F. Plant Material Observation: Landscape Architect may observe plant material in-person or via contractor/nursery provided photograph either at place of growth or at site before planting for compliance with requirements for genus, species, variety, cultivar, size, and quality. Landscape Architect may also observe trees and shrubs further for size and condition of balls and root systems, pests, disease symptoms, injuries, and latent defects and may reject unsatisfactory or defective material at any time during progress of work. Remove rejected trees or shrubs immediately from Project site.

G. Store bulbs, corns and tubers in a dry place at 60-65 degrees until planting.

1.6 WARRANTY

A. Special Warranty: Installer's standard form in which Installer agrees to repair or replace plantings that fail in materials, workmanship, or growth within specified warranty period.
1. Failures include, but are not limited to, the following:
   a. Death and unsatisfactory growth, except for defects resulting from lack of adequate maintenance, neglect, abuse by Owner, or incidents that are beyond Contractor's control.
   b. Structural failures including plantings falling or blowing over.
2. Warranty Periods from Date of substantial completion acceptance by Owner:
   a. Trees and Shrubs: One year.
   b. Ground Cover, Perennials and Vines: One year.

1.7 MAINTENANCE SERVICE

A. Initial Maintenance Service for Plantings: Provide full maintenance by skilled employees of landscape Installer. Maintain as required in Part 3. Begin maintenance immediately after each area is planted and continue until substantial completion.

PART 2 - PRODUCTS

2.1 TREE AND SHRUB MATERIAL

A. General: Furnish nursery-grown trees and shrubs complying with ANSI Z60.1, with healthy root systems developed by transplanting or root pruning. Provide well-shaped, fully branched, healthy, vigorous stock, free of disease, insects, eggs, larvae, and defects such as knots, sun scald, injuries, abrasions, and disfigurement. Furnish trees with the following characteristics:
   1. Root System Development
      a. Trees shall have been nursery-grown in clay soil & irrigated with drip irrigation.
      b. Trunk flare shall be visible from the nursery.
      c. (100% mechanically root-pruned during the first three years of the trees' life).
   2. Canopy Development
      a. Strong central leader to the top of the canopy. The tip of the leader on the main trunk must be intact and its terminal bud must be the highest part of the tree.
      b. No branch shall have a diameter greater than 2/3 the trunk diameter measured directly above the branch crotch.
      c. The tree crown must be structurally uniform. Branches shall be evenly distributed around the trunk. The crown shall be full of foliage which is evenly distributed around the tree.
   3. Trunk
      a. The tree trunk shall be relatively straight, vertical, and free of wounds that penetrate to the wood (properly made pruning cuts, closed or not, are acceptable and are not considered wounds), sunburned areas, conks (fungal fruiting bodies), wood cracks, sap leakage, signs of boring insects, galls, cankers, girdling ties, or lesions (mechanical injury).
      b. All graft unions, where applicable, shall be completely closed without visible sign of graft rejection. All grafts shall be visible above the soil line.

B. Root-Ball Depth: Furnish trees and shrubs with root balls measured from top of root ball, which shall begin at root flare according to ANSI Z60.1.

C. Provide plants of sizes, grades, and ball or container sizes complying with ANSI Z60.1 for types and form as indicated on Plant Schedule.

D. Shrub sizes indicated on Plant Schedule are sizes after pruning.

2.2 GROUND COVER PLANTS

A. Ground Cover: Provide ground cover of species indicated, established and well rooted in pots or similar containers, and complying with ANSI Z60.1.

2.3 ANNUALS, PERENNIALS, AND VINES

A. Annuals: Provide healthy, disease-free plants of species and variety shown or listed, with well-established root systems reaching to sides of the container to maintain a firm ball, but not with excessive root growth encircling the container. Provide only plants that are acclimated to outdoor conditions before delivery.

B. Perennials: Provide healthy, field-grown plants from a commercial nursery, of species and variety shown or listed, complying with requirements in ANSI Z60.1.

C. Vines: Provide vines of species indicated complying with requirements in ANSI Z60.1.

2.4 TOPSOIL

A. General: ASTM D 5268, pH range of 5.5 to 7, a minimum of 4 percent organic material content; free of stones 1 inch or larger in any dimension and other extraneous materials harmful to plant growth.
   1. Material Content by Mass:
      a. Sand Content: Minimum 20 percent / Maximum 50 percent
      b. Silt Content: Minimum 20 percent / Maximum 50 percent
      c. Clay Content: Minimum 10 percent / Maximum 40 percent
      d. Deleterious materials (rock, gravel, slag, cinder, roots, sod): 5 percent max.
   2. Unacceptable Materials: Concrete slurry, concrete layers or chunks, cement, plaster, building debris, oils, gasoline, diesel fuel, paint thinner, turpentine, tar, roofing compound, acid, and other extraneous materials that are harmful to plant growth.
   3. Topsoil shall have normal contents of nitrogen, phosphorus, potassium, calcium, magnesium, sulfur, and proper micronutrient levels. Nutrient levels must satisfy growing needs (as recommended by lab report required in Article 1.4.C) of the existing or planned plant material.

B. Topsoil Source: Amend existing in-place surface soil to produce topsoil. Verify suitability of surface soil to produce topsoil. Clean surface soil of roots, plants, sod, stones, clay lumps, and other extraneous materials harmful to plant growth.
   1. Surface soil may be supplemented with imported or manufactured topsoil from off-site sources.

2.5 PLANTING SOIL MIX

A. Planting Soil Mix: Mix topsoil with the soil amendments and fertilizers in the quantities per the results of the topsoil analysis in the soils report.Retain one or more of three subparagraphs below or revise to suit Project.

2.6 INORGANIC SOIL AMENDMENTS

A. Lime: ASTM C 602, agricultural limestone containing a minimum of 80 percent calcium carbonate equivalent and as follows:
   1. Class: T, with a minimum of 99 percent passing through No. 8 sieve and a minimum of 75 percent passing through No. 60 sieve.

B. Sulfur: Granular, biodegradable, containing a minimum of 90 percent sulfur, with a minimum of 99 percent passing through No. 6 sieve and a maximum of 10 percent passing through No. 40 sieve.

C. Iron Sulfate: Granulated ferrous sulfate containing a minimum of 20 percent iron and 10 percent sulfur.

D. Aluminum Sulfate: Commercial grade, unadulterated.

E. Perlite: Horticultural perlite, soil amendment grade.

F. Agricultural Gypsum: Finely ground, containing a minimum of 90 percent calcium sulfate.

G. Sand: Clean, washed, natural or manufactured, free of toxic materials.

2.7 ORGANIC SOIL AMENDMENTS

A. Compost: Well-composted, stable, and weed-free organic matter, pH range of 5.5 to 8; moisture content 35 to 55 percent by weight; 100 percent passing through 1-inch sieve; soluble salt content of 5 to 10 decisiemens/m.

B. Wood Derivatives: Decomposed, nitrogen-treated sawdust, ground bark, or wood waste; of uniform texture, free of chips, stones, sticks, soil, or toxic materials.

C. Manure: Well-rotted, unleached, stable or cattle manure containing not more than 25 percent by volume of straw, sawdust, or other bedding materials; free of toxic substances, stones, sticks, soil, weed seed, and material harmful to plant growth.

2.8 FERTILIZER

A. Bonemeal: Commercial, raw or steamed, finely ground; a minimum of 4 percent nitrogen and 10 percent phosphoric acid.

B. Superphosphate: Commercial, phosphate mixture, soluble; a minimum of 20 percent available phosphoric acid.

C. Commercial Fertilizer: Commercial-grade complete fertilizer of neutral character, consisting of fast- and slow-release nitrogen, 50 percent derived from natural organic sources of urea formaldehyde, phosphorous, and potassium in the following composition:
   1. Composition: 1 lb/1000 sq. ft. of actual nitrogen, 4 percent phosphorous, and 2 percent potassium, by weight.

D. Slow-Release Fertilizer: Granular or pelleted fertilizer consisting of 50 percent water-insoluble nitrogen, phosphorus, and potassium in the following composition:
   1. Composition: 20 percent nitrogen, 10 percent phosphorous, and 10 percent potassium, by weight.

2.9 MULCHES

A. Organic Mulch: Double (Triple) shredded hardwood bark suitable for mulching trees and shrubs, free of metal scrap and other impurities that can cause injuries; complying with the testing and performance requirements for hazardous metals and tramp metal according to ASTM F 2075
   1. Size Range: 3 inches maximum, ½ inch minimum.
   2. Color: natural

B. Pine Bark Mulch for Annual Beds: 3/8” fines

EXECUTION

3.1 PLANTING BED ESTABLISHMENT

A. Loosen subgrade of planting beds to a minimum depth of 24 inches. Remove stones larger than 1 inch in any dimension and sticks, roots, rubbish, and other extraneous matter and legally dispose of them off Owner's property.

B. Install planting soil as follows:
   1. Install or till soil amendments into existing topsoil in 12 inch lifts
   2. Provide planting soil to the following depths:
      a. Trees: 24 inches
      b. Shrubs, groundcover, vines, perennials, and ornamental grasses: 12 inches
      c. Annuals: 6 inches

C. Following the tilling of the planting beds, spread planting soil mix to a depth of 6 inches but not less than required to meet finish grades after natural settlement. Do not spread if planting soil or subgrade is frozen, muddy, or excessively wet.

D. Finish Grading: Grade planting beds to a smooth, uniform surface plane with loose, uniformly fine texture. Roll and rake, remove ridges, and fill depressions to meet finish grades.

3.2 TREE AND SHRUB PLANTING

A. No planting shall take place during extremely hot, wet, or freezing weather.

B. No additional plants shall be distributed about the planting bed area than can be planted and watered on the same day.Revise size and cross section of tree and shrub pits and trenches if required.

C. Excavation of Pits and Trenches: Excavate circular pits with sides sloped inward. Trim and scarify base leaving center area raised slightly to support root ball and assist in drainage. Scarify sides of plant pit smeared or smoothed during excavation.
   1. Excavate pits and trenches for trees at least 12 inches wider than root spread.

D. Before planting, verify that root flare is visible at top of root ball according to ANSI Z60.1.

E. Set each plant plumb and in center of planting pit or trench with root flare 2 inches above adjacent finish grades.
   1. Backfill: Planting soil
   2. Balled and Burlapped Stock: After placing some backfill around root ball to stabilize plant, carefully cut and remove burlap, rope, and wire baskets from tops of root balls and from sides, but do not remove from under root balls. Remove pallets, if any, before setting. Do not use planting stock if root ball is cracked or broken before or during planting operation.
   3. Container-Grown Stock: Carefully remove root ball from container without damaging root ball or plant.
   4. For Balled and Burlapped and Container-Grown stock, place planting soil mix around root ball in layers, tamping to settle mix and eliminate voids and air pockets. Water thoroughly once backfill process is complete.
   5. Bare-Root Stock: Support stem of each plant and spread roots without tangling or turning toward surface. Plumb before backfilling, and maintain plumb while working. Carefully work backfill around roots by hand. Bring roots into close contact with the soil.
   6. Continue backfilling process.

F. Slopes: When planting on slopes, set the plant so the root flare on the uphill side is flush with the surrounding soil on the slope; the edge of the root ball on the downhill side will be above the surrounding soil. Apply enough soil to cover the downhill side of the root ball.

G. Thoroughly water the Planting Soil and root ball immediately after planting..

H. Organic Mulching: Apply average thickness of organic mulch as indicated on planting details. Do not place mulch against trunks or stems as indicated on planting details.

3.3 TREE AND SHRUB PRUNING

A. Do not prune trees or shrubs before delivering to the site.

B. Prune, thin, and shape trees and shrubs according to standard horticultural practice. Prune trees to retain required height and spread. Do not cut tree leaders; remove only injured or dead branches from flowering trees. Prune shrubs to retain natural character.

C. All pruning shall be performed by a person experienced in structural tree pruning.

D. Except for plants specified as multi-stemmed or as otherwise instructed by the Owner’s Representative, preserve or create a central leader.

E. Pruning of large trees shall be done using pole pruners or if needed, from a ladder or hydraulic lift to gain access to the top of the tree. Do not climb in newly planted trees. Small trees can be structurally pruned by laying them over before planting. Pruning may also be performed at the nursery prior to shipping, if approved by Landscape Architect.

F. Remove and replace excessively pruned or malformed stock resulting from improper pruning that occurred in the nursery or after.

G. Pruning shall be done with clean, sharp tools.

H. No tree paint or sealants shall be used.

3.4 GROUND COVER AND PLANT PLANTING

A. Set out and space ground cover and plants as indicated.

B. Schedule the planting to occur prior to application of the mulch. If the bed is already mulched, pull the mulch from around the hole and plant into the soil. Do not plant the root system in the mulch. Pull mulch back so it is not on the root ball surface.

C. Dig holes large enough to allow spreading of roots and backfill with planting soil.

D. Work soil around roots to eliminate air pockets and leave a slight saucer indentation around plants to hold water.

E. Water thoroughly after planting, taking care not to cover plant crowns with wet soil.

F. Protect plants from hot sun and wind; remove protection if plants show evidence of recovery from transplanting shock.

3.5 PLANTING BED FINISHING

A. After planting, smooth out all grades between plants before mulching.

B. Separate the edges of planting beds and lawn areas with a smooth, formed edge cut into the turf with the bed mulch level slightly lower, one (1) and two (2) inches, than the adjacent turf sod or as direction by the Owner's Representative. Bed edge lines shall be depicted on the drawings.

3.6 PLANTING BED MULCHING

A. Mulch surfaces of planting beds and other areas indicated. Provide mulch ring around trees in lawn areas.

B. Lift all leaves, low hanging stems and other green portions of small plants out of the mulch if covered.
   1. Organic Mulch: See planting details for average thickness of mulch. Do not place mulch against plant stems.

3.7 PLANT MAINTENANCE

A. Tree and Shrub Maintenance: Maintain plantings until substantial completion by pruning, cultivating, watering, weeding, fertilizing, restoring planting saucers, and resetting to proper grades or vertical position, as required to establish healthy, viable plantings. Spray or treat as required to keep trees and shrubs free of insects and disease.

B. Ground Cover and Plant Maintenance: Maintain plantings until substantial completion by watering, weeding, fertilizing, mulching, and other operations as required to establish healthy, viable plantings.

C. Protect exterior plants from damage due to landscape operations, operations by other contractors and trades, and others. Maintain protection during installation and maintenance periods. Treat, repair, or replace damaged plantings.

D. At the time of Substantial Completion, verify that tree-watering devices are in good working order and leave them in place. Replace improperly functioning devices.

3.8 CRITERIA FOR UNACCEPTABLE PLANTS

A. Criteria for rejection of plants will include but is not limited to:
1. Any dead or missing plant, any cause.
2. Defoliations of more than 25% of leaf area dead, lost or dropped for shrubs, vines or groundcovers.
3. Die back of more than 25% of the shrub height.
4. Bark wounds of more than 15% of bark circumference or 2” length for trees.
5. Die back, defoliation or wind burn of more than 10% of tree canopy.
6. Rootbound or circling roots, unless approved remediation by LA for contractor to cultivate roots using appropriate tools to loosen roots to promote healthy root establishment.

3.9 MAINTENANCE SERVICE

A. Maintenance Service: Provide maintenance by skilled employees of landscape Installer. Maintain as required in “Plant Maintenance” Article 3.7. Begin maintenance immediately after plants are installed and continue until plantings are acceptably healthy and well established, but for not less than maintenance period below:
1. Maintenance Period for Trees and Shrubs: Continues until date of Substantial Completion.
2. Maintenance Period for Ground Cover and Other Plants: Continues until date of Substantial Completion.

END OF SECTION