SECTION 32 90 00 – PLANTING

PART 1 - GENERAL

1.1 SUMMARY

A. Description

1. Work included: Provide all labor, materials and installation necessary to complete the fine grading, incidental grading, planting and related work as required.

B. This Section includes the following:

1. Plant materials
2. Planting accessories
3. Planting mulch
4. Soils & soil amendments
5. Fertilizers, herbicides, and pesticides

C. Related work described elsewhere:

a. Section 32 84 00 – “Irrigation”
b. Section 32 01 90 – “Operation and Maintenance of Planting”
c. Section xx xx xx – “Trees”

1.2 REFERENCED STANDARDS

B. Standard Methods of the Association of Official Agricultural Chemists.
C. ASTM D 698 – Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort
E. United States Department of Agriculture (USDA) - Soils Classification Taxonomy.
G. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/use/urban/?cid=nrcs142p2_053993

1.3 LAWS, CODES AND REGULATIONS

A. Perform Work in accordance with all applicable laws, codes and regulations required by authorities having jurisdiction over such Work and provide for all inspections and permits required by federal, state and local authorities in furnishing, transporting and installing materials as shown or for completing the Work identified herein.

1.4 EXISTING UTILITIES

A. Existing utilities and improvements not designated for removal shall be protected in place. Any damage shall be repaired by the Contractor at no additional cost to UT Austin.

1.5 SUBMITTALS

A. Documentation for Sustainable Sites: For products that are extracted, harvested or recovered and manufactured from within 250 miles of Austin. Indicate location and distance from Austin of material manufacturer and point of extraction, harvest, or
recovery for each raw or recycled material. Include statement indicating costs for each product that is regionally extracted, harvested or recovered and manufactured.

B. General: Comply with Section 01 61 00 – Common Product Requirements.

C. Test Reports:

1. The Contractor shall submit landscape material test reports for the following:
   a. Existing topsoil source with nutrient analysis (Texas Plant and Soils Lab, Edinburg, TX (936-383-0739)
   b. Fertilizers/soil amendments/chemicals

2. A certified laboratory retained by the Contractor shall provide agronomy testing and verification of representative landscape material samples proposed for use on UT Austin projects. Testing includes, but is not limited to, the following:
   a. Plasticity index (PI)
   b. Soil pH
   c. Particle size, percentage soil texture
   d. Percentage organic material
   e. Nutrient level analysis
      - All macro, secondary and micronutrient
      - Nitrate
      - Potassium
      - Phosphorous
      - Calcium
      - Magnesium
      - Sodium
      - Percolation rate
      - Conductivity

3. Based on the above testing, the laboratory shall make recommendations on type and quantity of organic amendments required to bring these materials into acceptable ranges as specified in Part 2 – Products of this section. Contractor shall submit test results prior to, or at the same time as, the suggested amendments.

4. The Contractor shall submit separate agronomy tests with soil preparation recommendations for irrigated tree and shrub areas. A minimum of three (3) soil samples shall be tested. These samples are to be taken from various areas of the site with the objective of identifying differing soil conditions. Submit soil sample locations for approval prior to gathering sample. The location of each sample is to be identified on a map and a written summary. Each individual sample is to be prepared and presented to the UT Landscape Services. In addition to the analysis of the soil conditions the testing lab is to identify specific recommendations for supplementing and improving the soil to provide an optimal germination and growing condition.

5. Soil tests have already been completed for existing on-site fill material. Test results for his material, attached to this specification section as Exhibit 1, can be used by Contractor to determine amendments required to bring soil into acceptable ranges specified in Part 2 – Products of this section. All other soil to be used on site for landscape shall be tested as indicated above.

PART 2 - PRODUCTS

Design & Construction Standards, April 2016
2.1 GENERAL

A. All plants and raw materials shall be manufactured and/or extracted or harvested within 250 miles of UT Austin site and all recycled or salvaged materials shall be manufactured and recovered within 250 miles.

B. Steel Edging

1. All planter beds which contact turf areas shall be edged between bed and turf, whether or not indicated on the plans, with specified steel edging. Set edging 2” above the turf finish grade. Top of mulch in planter beds will be level with top of steel edging.

2. Steel edge shall be ¼” x 6”, dark green or brown, commercial grade; install per manufacturer’s instructions.

2.2 PLANT MATERIAL

A. Plants shall be high quality, exhibit a growth habit that is normal for the species, and be sound, vigorous, healthy, and free from insects, plant diseases and injury. Container, box, ball, height and spread dimensions shall be measured according to specified standards and good practice.

B. Container plants shall have been in containers for sufficient length of time for root system to hold earth when taken from container but not long enough to become root-bound or cause “hardening-off.” Heeled-in stock or stock from cold storage is not acceptable. Plants cut back from larger sizes to meet specifications will not be acceptable.

C. Plant names shall conform to those given in "Standardized Plant Names" latest edition, prepared by the American Committee on Horticultural Nomenclature, or be names generally accepted by the trade.

D. Select, dig, transport, protect and plant in accordance with requirements of these specifications and "American Standards for Nursery Stock" and with accepted good practice.

E. Certificates shall accompany shipments as proof of inspection and quality as may be required by federal, state or other authorities. Each shipment shall be declared free of disease and insects of any kind. Label each plant or bundle and deliver bulk material in sealed, labeled bags, testifying as to percent of purity of contents.

F. Should any conflict arise as to the quality of any plant materials, the decision of UT Landscape Services is final.

G. Balled and Burlapped Stock: This stock will be defined as nursery plant stock which has been removed from the growing site with a ball of soil, containing the intact root system, and encased in burlap (or other approved similar material) to hold the soil in place. Ball sizes for balled and burlapped stock shall be as shown on the Drawings. NOTE: Remove entire wire basket, and half –two-thirds of burlap from rootball following installation.
H. Collected Stock: This stock will be defined as nursery plant stock, which has been removed from its original native habitat. All collected stock shall receive specific approval of the UT Landscape Services or designated representative before it can be removed from its existing habitat. Ball sizes for collected stock shall be as shown on the Drawings and shall have sufficient diameter and depth to encompass enough fibrous and feeding root system consistent with approved salvage methods and as necessary for the full recovery of the plant. Collection may be by hand or mechanical method.

I. Bag Grown Stock: This stock will be defined as nursery plant stock which has been transplanted into a nonwoven fabric container which has been placed in the ground and the plant grown under nursery field conditions continuously long enough - normally one (1) month for each inch of bag diameter i.e., a plant with a 24 inch diameter bag, grown in its original planted location for 24 months] for the fibrous roots to have developed so that the root mass retains its shape and holds together after removal of the bag. The root ball shall be flat bottomed and straight sided. Ball sizes for bag grown stock shall be as shown on the Drawings. Bag grown stock shall not be pruned before delivery.

J. Plant Size:

1. Trees 15 gallon and larger shall conform to the standards of Container Size to Caliper Height and Spread established and published by the American Standard for Nursery Stock Recommended Average Tree Specifications.

2. Plants will be measured when branches are in their normal position. Height and spread dimensions shown on the Drawings refer to the main body of the plant and not branch tip to tip. Plants with a spreading or semi-spreading habit will be measured by the average diameter of the spread. Plant heights will be measured by the mean height from the ground line to the top of the canopy. Caliper measurements will be taken at a point on the trunk six (6) inches above natural ground for trees up to four (4) inches in caliper and at a point twelve (12) inches above natural ground for trees over four (4) inches in caliper. The caliper size for multi-trunked plants will be determined by adding the calipers of the largest cane and one-half (1/2) the caliper(s) of the second and third largest cane(s).

3. When a range of size is shown on the Drawings, no plant shall be less than the minimum size and at least 40% of the plants shall be as large as the maximum size shown on the Drawings. The required measurements are the minimum sizes acceptable and are the measurements after pruning, when pruning is required.

4. Sizes of plants or plant types such as vines, groundcovers, seedings, young plants, understock, etc., will be measured in accordance with the plant standards or as indicated on the Drawings.

5. Container-grown plants which are well established in adequate size containers and are of equal quality and size to the specified balled plants may be accepted in lieu of balled plants; likewise, balled plants of equal quality and size may be substituted for container-grown plants when permitted by the Landscape Architect or designated UT Landscape Services. Soil shall be approximately 3/4 depth of container and contain roots of the plant throughout the soil.

6. The ball size for a balled and burlapped plant shall be firm natural balls equal to or in excess of the ball sizes indicated on the Drawings. Collected plant material substituted for a nursery-grown plant shall have a ball or root system 1/4 greater
in both diameter and depth than the nursery-grown plant for which it is substituted. The ball size shall be the average of the diameters measured 90 degrees apart (refer to Technical Standards for Tree Planting, Pruning and Removal Sec. 1, Tree Specifications)

K. Trees shall have a strong central leader. Trees that have a main trunk forming a “Y” (or codominant stem) shape are not acceptable. In no case will trees that have been topped be acceptable.

7. Pruning shall not be done prior to delivery except with specified written approval from UT Landscape Services. No pruning wounds shall be present with a diameter of more than 1” and such wounds must show vigorous bark growth on all edges. Dead or damaged branches or cross-over growth shall be removed (refer to Technical Standards for Tree Planting, Pruning and Removal Sec. 1, Tree Specifications)

L. Inspection of plant materials as required by city, county, state or federal authorities shall be the responsibility of the Contractor, who shall have secured permits or certificates prior to delivery of plants to site.

M. Plants are subject to inspection and approval or rejection at nursery source or on project site at any time before or during progress of Work for size, variety, condition, latent defects and injuries. Remove rejected plants from project site immediately.

2.3 MULCH

A. Mulch material shall be shredded hardwood bark. It shall be of such nature that adequate protection is provided against sun baking and quick drying out of the soil and shall not impede aeration or water penetration nor deplete the soil nitrogen. Mulch material shall be free of excess amounts of large leaves and sticks that would prevent proper dressing of the mulched surface, free of harmful substances and free of detrimental amounts of soil or other foreign matter that would promote early compaction, matting or deterioration of the mulch.

2.4 PLANTING SOIL MIXTURE (BACKFILL)

A. Tree planting backfill shall be native soil excavated from pit, mixed with pre-approved soil mixture.

B. The planting soil mixture shall be organic and shall consist of a soil mixture of 3/4 fine sandy loam and 1/4 compost, (Flower & Garden plus with composted soil or approved similar). The sandy loam shall be taken from a well-drained, arable site. It shall be free of subsoil, stones, clay, roots, weeds, grass or other objectionable debris, matter or toxic wastes.

C. Planting soil shall have a pH between 6.5 and 8.0 and a 1.5 to 3 percent organic content and no greater than a 500-ppm concentration of soluble salts.

2.5 PLANTING SOIL

A. Permeable soil shall be sandy loam, loamy sand or loam texture with a clay content of 10 to 25 percent. The soil must have an infiltration rate of at least 0.5 inches per hour and have a 1.5 to 3 percent organic content (Flower & Garden plus with composted soil or approved similar Organics by Gosh 512-276-1211)
B. Permeable soil shall have a pH between 6.5 and 7.5 and a 1.5 to 3 percent organic content and no greater than a 500-ppm concentration of soluble salts.

2.6 WATER DURING INSTALLATION OR STAGED ONSITE
A. Provide hoses, connections, and other equipment necessary to distribute water from source to required locations. Do not waste water or let it run into University thoroughfares.

2.7 ADDITIONAL SOIL AMENDMENTS – AS RECOMMENDED BASED ON SOIL TEST ANALYSIS:
A. Organic fertilizer such as Microlife 6-2-4 by San Jacinto Environmental Supply (713-957-0909), “Ladybug” 8-2-4 formula by The Natural Gardener (512-288-9740) or approved equal.
B. Root stimulator shall be Vitamin B-1 Medina, etc. and shall not contain synthetic fertilizer.

2.12 PLANTING ACCESSORIES (ONLY IF NECESSARY/REQUIRED)
A. Tree Stakes: Steel T-stakes, only stake trees if required or as specified by UT Arborist. If used, do not create trip hazards. Stakes shall be painted silver or as directed in the Drawings. Minimum height of stakes 48”.
B. Tree Ties: Wire of pliable galvanized zinc-coated iron of #10 gauge; provide a minimum of two (2) per tree.
C. Hose covering: 2-ply, reinforced, rubber garden hose, minimum of 1” diameter.
D. Tree Guard: “ArborGard+” by DeepRoot, 1-800-458-7668 (or equal).
E. Tree stakes are to be removed 1 year after planting.
F. Any product used shall not damage plant material in any way.

PART 3 - EXECUTION

3.1 COORDINATION
A. Coordinate as required with other trades to assure their proper and adequate interface with Work of this section. Coordinate schedules for installation of Work with schedules for other installations in order to assure orderly progress of the total construction sequence.

3.2 EXAMINATION
A. Examine areas to receive landscape installation for compliance with requirements and conditions affecting installation and performance. Proceed with installation only after unsatisfactory conditions have been corrected.

3.3 PREPARATION
A. Protect structures, utilities, sidewalks, pavements, and other facilities, and existing vegetation from damage caused by landscape installation operations.
B. Provide erosion-control measures to prevent erosion or displacement of soils and discharge of soil-bearing water/sedimentation runoff or airborne dust to adjacent properties and walkways.
C. Soil Preparation for Shrub and Ground Cover Beds.
1. Pre-Plant Weed Control  
a. If live perennial weeds exist on site at the beginning of work, spray with a non-selective systemic contact herbicide as recommended and applied by an approved licensed landscape pesticide applicator. Leave sprayed plants intact for at least fifteen (15) days to allow systemic kill. Apply herbicide in strict accordance with manufacturer’s instructions.  
b. Clear and remove these existing weeds by scraping or grubbing off all plant parts at least 1” below the surface of the soil over the entire area to be planted.  

2. Backfill for Shrub and Ground Cover Beds  
a. Remove existing soil to an overall depth equal to ten (10) inches below finish grade.  
b. Till exposed soil to a minimum depth of six (6) inches.  
c. Add three (3) inches of expanded shale, if deemed necessary, and rototill to a depth of six (6) inches.  
d. Add three (3) inches of pH balanced compost and rototill to a depth of six inches.  
e. Mulch all planting areas when plant installation is complete with a minimum settled depth of three (3) inches of composted shredded hardwood mulch.  
f. Notify UT Landscape Services for soil inspection after initial excavation and prior to loosening the exposed soil.  

3. At time of planting, all areas to be planted shall be free of stones, stumps, or other deleterious matter 1” in diameter or larger and shall be free from all wire, plaster or similar objects including construction debris that would be a hindrance to planting or maintenance.  

D. Excavation Under Existing Trees to Remain:  
1. Soil shall not be excavated for soil preparation purposes from anywhere within the CRZ – Critical Root Zone of any existing tree which is to remain on site, unless approved by UT Arborist.  
2. UT Austin/Owner does not recommend any planting within CRZ of existing trees. Where the Planting Plan designates plantings to be added to the project under existing trees, outside the CRZ, the soil preparation in those areas shall be as follows:  
a. Air spade the soil loose to three (3) inch depth within the existing root system-no rototilling.  
b. Remove all weeds by hand once soil is loosened.  
c. Install one half (1/2) inches settled depth of compost to loose soil.  
d. Hand mix compost with loose native soil.  
e. Water beds to promote weed germination of dormant weeds and grasses  
f. Treat weeds in beds with an application of organic herbicide and hand pull.  
g. Remove weeds after recommended herbicide treatment period by hand digging.  
h. Remove rocks, loose root pieces, trash, dirt clods or other objects 1” and greater in size from the planting bed.  

3.4 INSTALLATION  

A. Planting shall occur only when weather and soil conditions permit, and in accordance with locally accepted practices, and as reviewed by UT Landscape Services.  

B. Soil Compatibility Tests: Perform topsoil compatibility tests for pH and chemical contamination prior to completion of rough grading.
C. Site Preparation: Prepare site by applying contact herbicide to weed growth on site as per manufacturer’s label directions. Provide three (3) applications, each one week apart. Scarify planting areas to a minimum depth of six (6) inches. Float beds to grade and rake to remove weeds, clods, or rocks one (1) inch in diameter or greater. Thoroughly water-settle all soil.

D. Topsoil Installation:
   1. Do not work soil when moisture content is so great that compaction will occur or when it is so dry that clods will not break readily. Apply water if necessary to bring soil to an optimum moisture content for filling and planting.
   2. All compacted soils will be treated as necessary to provide adequate aeration.

E. Fine grading
   1. Fine grade all planting areas. Provide incidental grading of all areas adjacent to curbs and sidewalks. Grade planting areas to a smooth, uniform surface plane with loose, uniform fine texture. Remove ridges and fill depressions to meet finish grades. Soil grades adjacent to paving, curbs or headers shall be adjusted for surface materials.
   2. Maintain or provide positive drainage away from all building structures. Drainage flows shall not be impaired with obstructions.
   3. Unless otherwise specified, final grade (at top of any surface materials) shall be set at 1 inch below adjacent paving, curb and headers for turf and planting beds unless shown otherwise.
   4. Existing soil shall be graded to curbing with a 4 to 1 maximum slope.

F. Excavation of Plant Pits:
   1. The Contractor shall not excavate plant pits more than 24 hours in advance of planting operations. Any plant pits left unattended for any length of time which may present a hazard shall be covered and/or clearly flagged as approved by the Engineer or designated representative. The walls and bottoms of all plant pits shall be scarified immediately prior to the placement of plants.
   2. Pit Sizes: Planting holes may be dug by hand or by mechanical means and shall be circular or square (according to the shape of the root ball) with vertical sides, unless otherwise indicated on the Drawings. Trimming of the sides or bottom of the hole to uniform shape will not be required. Planting pit sizes shall be as follows, unless indicated otherwise on the Drawings:
      a. A minimum horizontal dimension of twelve (12) inches between the root ball and the sides of the planting pit for the following plant specifications:
         (1) Containers of fifteen (15) gallons or larger
         (2) Boxes of fourteen (14) inches or larger
         (3) Root ball diameter of Balled and burlapped or bag grown plants larger than fourteen (14) inches.
      b. A minimum horizontal dimension of two (2) times the diameter of the root ball for the following plant specifications:
(1) Containers less than fifteen (15) gallons
(2) Root ball diameter of Balled and burlapped or bag grown plants fourteen (14) inches or less

c. A minimum diameter for bare-root plants to permit the roots to spread without crowding or curving around the walls of the pit.
d. Planting pits shall be excavated to a depth of at least 4 inches but not more than 8 inches greater than the depth of the root ball of balled and burlapped, containerized, container grown or bag grown plants; or the depth of the root system of bare-root plants. Pits dug to excess depths shall be backfilled and compacted to bring the pits to the specified depth. The depth of pits on slopes shall be measured at the lower side.
e. When performing mechanical transplanting, the receiving plant pit shall be backfilled as necessary with native or amended soil material as approved by UT Landscape Services.
f. Where holes are dug with an augur and the sides of the holes become plastered or glazed, this plastered or glazed surface shall be scarified.

3. Fill pits with water: Contact UT Representative if water does not percolate within 24 hours. Do not plant until proper measures have been taken to ensure appropriate percolation.

J. Pruning Roots

1. Root pruning shall be limited to the amount necessary to prune away broken and badly damaged roots. Any girdling roots on edge of rootball shall be cut with a handsaw or pruners. Severely girdled plants will be rejected on site.

L. Pruning

1. Pruning of plants shall be executed by certified arborist and shall conform to the best horticultural practice and shall be appropriate to the various types of plants and the special requirements of each. Plants otherwise acceptable, but with broken or badly bruised branches, shall have such branches removed with a clean cut. All cut surfaces ON OAK TREES ONLY over 1 inch (25 mm) in diameter shall be painted with an approved tree pruning compound.

2. Prior to the application of any tool to a tree, the tool must be sterilized. The tool does not need to be sterilized again until immediately prior to use on another tree.
   a. Oak Wilt Prevention Notes
      i) Avoid pruning or wounding oak trees from February through June
      ii) Pruning shall be done with sterilized, sharp tools. To prevent bark tears, the weight of the branch shall be removed before making final pruning cut.
      iii) Pruning cuts or damaged areas on an oak tree shall be painted within five minutes with a standard tree wound dressing or latex paint. Tree wound dressing shall be either treekote aerosol or tanglefoot pruning sealer (or approved equal).

M. Planting and Backfilling
1. Topsoil from the planting hole may be used for backfilling provided it is kept separate from subsoil and rendered loose and friable. Additional topsoil required to backfill the holes shall be furnished. (See products section).

2. In general the top of any tree’s root ball shall stand after settlement of the backfill approximately level with or 1” above finish grade. Shrubs shall be planted with the root ball flush with the level of settled backfill unless specifically noted otherwise specified. Unless indicated otherwise or approved otherwise by the UT Landscape Services or designated Representative, planting and backfilling shall be as follows:

3. Depth of Transplanting
   a. In general, plants shall be installed and covered with top soil approximately one (1) inch (25 mm) above the top of the root ball or container soil surface.

4. Balled and Burlapped Plants
   a. Plants of this type shall not be handled by the stems nor in such manner that the soil of the ball may be loosened. A saddle around the ball should be used for lifting. No plastic burlap material will be allowed. The burlap shall not be removed from the ball. After the plant has been placed in the proper position, as shown on the Drawings, loose friable backfill shall be worked about the ball in 12 inch lifts until the pit is two-thirds (2/3 full). The burlap shall then be opened on top of the root ball to expose the top one-third (1/3) of the root ball. The pit shall then be filled with water and the backfilling completed, working the backfill and water well to prevent any air pockets.

   b. For ball supporting devices such as wire baskets, the basket shall not be removed. The plant shall be placed in the prepared planting pit in the proper position and backfill shall be placed around the ball until the pit is about one-third (1/3) full. The basket shall be carefully removed to just above the backfill, leaving the bottom portion intact. Remove all other non-biodegradable materials such as twine, nylon bagging, and the like. Backfilling shall be completed as described above.

5. Containerized or Container Grown Plants
   a. At the time of planting the root ball and plant shall be carefully removed from the container to prevent damage to the plant and root ball. If in the opinion of the Landscape Architect or designated UT representative a sufficient amount of soil has fallen off or the ball has been broken to such an extent as to reduce the chances of the plant to grow, the plant will be rejected. Container plants shall be acclimated to outside growing conditions. Container plants shall be placed and backfilled in the same manner as balled and burlapped plants. Any girdling roots on edge of rootball shall be cut with a handsaw or pruners.

N. Vegetative Watering

1. During the planting operations, the Contractor shall keep the ground and backfill material moist to at least 12 inches around the root ball. The Contractor shall be required to meet the minimum watering requirements shown on the Drawings for all circumstances by a method approved by the Landscape Architect. When an
irrigation system is shown on the Drawings, the Contractor shall coordinate his work to insure that the irrigation system is operational as the plants are installed.

O. Pruning

1. Plants shall not be pruned immediately before delivery to the work site, unless approved by UT Landscape Services. Common nursery pruning practices are acceptable. Any necessary pruning shall be done at the time of planting as approved by the UT Landscape Services and shall be appropriate to the various types of plants and the special requirements of each.

3.5 CLEAN-UP

A. Remove all waste and debris; clean all pavement of soil and mulch created by this work from site.

3.6 DISPOSAL

A. Remove surplus soil and waste material, including excess subsoil, unsuitable soil, trash, debris, and legally dispose of them off Owner’s property at Contractor’s expense.

3.7 MAINTENANCE AND PROTECTION

A. Comply with Section 32 0190 – Operation and Maintenance of Planting.

END OF SECTION 32 90 00