SECTION 32 90 00

PLANTING

3.1 RELATED WORK

FDG General Design Documents:
   Landscape Design Guidelines

FDG Specifications Guidelines:
   Section 01 56 39 Tree and Plant Protection
   Section 31 10 00 Site Preparation
   Section 31 20 00 Earthwork
   Section 32 84 00 Irrigation
   Section 32 01 00 Site Restoration and Rehabilitation

FDG Drawings:
   Irrigation Drawings IR-01 –IR-28
   Planting Details PL-01 –PL- 06

3.2 PLANTING

A. General:
   1. All planting sites shall have a soil analysis performed by a soils and plant lab approved by Stanford LBRE Grounds Department. Recommendations from this analysis shall be incorporated into the Project scope as needed.

   2. All planting areas for ground covers and lawns shall be scarified to a minimum depth of ten (10") inches and in two directions, prior to tilling. Note: scarification shall not occur within the root zone of existing trees. (The tree root zone is defined as the area from the trunk out to 10’ beyond the tree’s dripline). All exceptions must be approved in advance by a Stanford LBRE Grounds Certified Arborist.

   3. All ground cover and shrubbery areas should usually be treated immediately after planting with pre-emergent herbicide, which shall be approved prior to use by Stanford University Grounds Services. Herbicides or pesticides that are identified by local, state, or federal agencies as potential ground water contaminants are prohibited from use at Stanford. Examples of such materials that are prohibited include but are not limited to: Atrazine, Simazine, Bromacil. The contractor is responsible for ensuring that no such materials are used in conjunction with their landscape planting and maintenance activities.

   4. Commercial fertilizer shall be spread at the recommended rate appropriate for the plant material, as indicated by the soil analysis, and tilled into the top six (6") inches of soil.
5. A minimum three-inch (3") cover of organic soil amendment shall be spread uniformly over the soil (9 yards per 1000 sq. ft. or as prescribed by the soil analysis) and tilled into the top six inches (6") of soil. A soil amendment analysis shall be submitted to the Stanford LBRE Grounds manager for review and approval prior to purchase or use.

6. When planting trees and shrubs, do not loosen soil at the bottom of the planting hole; lightly compact soil under root ball if loose. Dimensions of the hole will vary with the size of the root ball. The depth of the hole shall be 1-4" less than the height of the rootball (See numbers 13. And 14.) The width of the hole shall be at least 12" wider than the rootball. The edge of the planting hole shall be scarified to allow for better root penetration into the surrounding soil. See FDG Drawing PL-01, Tree and Shrub Planting Pit.

7. Use unamended native soil as backfill for tree and shrub planting pits, or as prescribed by the soil analysis. When planting trees and shrubs, the rootball shall contact the backfill soil with no gaps. If amendment is needed, amending the entire planting area as described previously in number 5 is preferred over amending the backfill soil alone. Water at the time of planting, see number 8.

8. For trees and shrubs in areas without lawns, a watering basin shall be built around the perimeter of the backfilled plant hole to form a shallow basin for the retention of irrigation water. The basin shall be constructed to avoid holding water against the trunk of the plant. Each basin shall be mulched with two to three inches (2" -3") of mulch; the mulch shall be kept approximately 6-12" away from the trunk of the plant. Do not bury plant crown with mulch. (A very thin layer (NTE ¼")of mulch may be applied near the trunk for aesthetic purposes.) Note: Some areas such as decomposed granite areas cannot accommodate watering basins. See FDG Drawing PL-06, Palm Planting and Irrigation in Decomposed Granite Areas, for an example.

9. Stanford LBRE Grounds Department shall be contacted prior to planting for soil drainage recommendations. If the area is suspected to be poorly drained, plant holes shall be randomly tested for drainage by filling with water and confirming that all areas have drained within two (2) hours after filling. The random testing shall be performed on ten percent (10%) of the total large size (15 gallon or larger) holes for the project. If more than twenty percent (20%) of these holes fail, then an additional ten (10) holes shall be tested. Areas that do not pass this test shall be corrected prior to planting; for example, by installing a drainage system. Corrective measures shall be approved by Stanford LBRE Grounds.

10. All newly seeded turf areas shall be free of broadleaf weeds. Where directed by the Project Manager, infested areas shall be treated by the Contractor with a selective broadleaf herbicide approved by Stanford Grounds Services.

11. Staking and Guy Wire tree support specifications:
   a. Staking for all five (5) gallon to twenty-four inch (24") box trees shall use a double stake system. Drive two eight-foot by two inch diameter (8' x 2" dia.) lodgepole pine stakes (treated with copper
napthanate) twelve inches (12") into undisturbed soil. Fasten tree to stakes with solid rubber strips or approved equal ties (minimum of two), placed one immediately above the other at the lowest height at which the tree can stand upright on its own. Tie tree at only one height. Do not place ties at 2 different points along the stem of the tree. Tree ties shall not have internal wire. There shall be no wire around any part of the tree to prevent girdling. Trim stakes to a height just above tree ties. See the FDG Drawing PL-02, Tree Staking.

b. If using guy wires for tree support, wire shall be inserted into white plastic tubes or pipes for better visibility and safety.

12. Tree planting in sidewalk/curb/mall locations (or anywhere that roots are entirely hard surface covered) shall be in accordance with specifications as follows.

a. Excavation - Hand dig holes and do not undermine existing facilities. Do not loosen soil at the bottom of hole; lightly compact soil under root ball if loose. Dimensions of the hole will vary with the size of the root ball. The depth of the hole shall be 3-4” less than the height of the rootball. The width of the hole shall be at least 12” wider than the rootball. Tree wells located in sidewalks shall have the top of root ball no greater than four inches (4") below the sidewalk surface.

b. Drain Pipe – Shall be installed only if required by drainage test; see number 9.

c. Staking – Follow the same guidelines as in number 11.

d. Backfill – Follow the same procedure as in number 6.

e. Engineered fill soil (structural soil) shall be used where the root systems of nursery stock trees or shrubs must grow under hard or impermeable surfaces, such as patios, sidewalks, streets, planting areas over structures or parking garages, parking lot medians and islands, and other similar conditions. Engineered fill soil is structural soil such as Cornell Structural Soil, which was developed at Cornell University to safely bear pavement loads after compaction and still allow root penetration and vigorous tree growth. See http://www.hort.cornell.edu/uhi/outreach/csc/ for more information. All engineered fill soil shall be licensed, trademarked ‘CU-Soil’ to insure quality control. Transplanted trees should only have native backfill soil used during installation.

13. Trees shall be planted such that the root collar or bottom of the trunk is 3-4” above grade to account for settling of soil.

14. Woody shrubs shall be planted such that the root collar or bottom of the trunk is 1-2” above grade to account for settling of soil.
15. Planting at the entrance to roadways, parking lots, or pedestrian areas shall be maintained at a height that allows clear visibility for persons leaving or entering the vehicular area.

3.3 FIELD QUALITY CONTROL

A. General:

1. At the time of certain key activities during landscape construction, the Stanford LBRE Grounds Supervisor responsible for landscape maintenance after completion of the Contractor’s obligation shall be consulted. The Stanford Project Manager shall therefore arrange for the participation of the Grounds Services Supervisor at the onset of the following activities. Contact the Customer Support Services Center @650-723-2281 to arrange an appointment with a Grounds Services Supervisor.
   a. Inspection of plant material.
   b. Soils report and recommendations from soils and plant lab.
   c. Soil amendments, fertilizers and pre-emergent herbicides prior to use.
   d. Subgrade examination and ground loosening.
   e. Plant hole random drainage testing
   f. Sample stake and tie setup.
   g. Three (3) days advance notice prior to testing irrigation system.

2. All installations shall be inspected by the Stanford LBRE Grounds Maintenance and Irrigation Supervisors prior to backfill and during pressure leak testing. Contact the Customer Service Center at 723-2281 to arrange appointment with Stanford LBRE Grounds supervisors (3 days advance notification is required).

3. Testing of the irrigation main line shall be made with a water pressure of 125 psi for two (2) hours.

4. All wiring shall be tested in presence of the Stanford LBRE Grounds Irrigation Supervisor.

B. Preliminary Inspection
   Upon completion of all planting and all cleanup work, the Contractor shall request a preliminary inspection which includes the Stanford University Architect and Planning Office, Stanford LBRE Grounds Department (including a Certified Arborist, irrigation supervisor, grounds maintenance supervisor, and horticultural supervisor); the Stanford Project manager and the contractor. Completion of all corrective work and inspection with full approval of it shall establish the beginning of the maintenance period. No partial approvals shall be given.

3.4 CLEANING

A. General:
   1. All areas included in the limit of work as indicated on the drawings shall be completely clean before the preliminary inspection.
2. All cans, rocks, debris, and other foreign material shall be removed from the site. All paved areas shall be washed. This condition of cleanliness shall be maintained throughout the maintenance period and to the satisfaction of the University.

### 3.5 MAINTENANCE AND GUARANTEE PERIOD

**A. Maintenance Period:**

1. Maintenance shall start immediately upon the Stanford LBRE Grounds Department full approval as specified above. It shall continue for ninety (90) calendar days, unless otherwise determined by Stanford LBRE Grounds Department, the Stanford University Architect and Planning Office and the Stanford Project Manager, and until acceptance of the entire Project. On minor projects, where the cost of Contractor maintenance is disproportionately high as related to the construction cost, the maintenance period can be reduced to sixty (60) or forty-five (45) days, with the concurrence of the Project Manager.

2. All plants shall be kept in healthy, growing condition by replacement of dead or dying plants where necessary, by watering, weeding, cultivating, pruning, spraying, trimming, protection from wind, and by performing any other necessary operations or maintenance until acceptance of the planting at the time of the final inspection. A final weeding of all plant areas shall be made immediately prior to final inspection. Newly planted trees shall be pruned as directed by a Stanford LBRE Grounds Certified Arborist. All dead branches shall be removed. Rootstock shoots from below grafted material shall be removed.

3. The final inspection shall be held at the conclusion of the maintenance period. Prior to being considered ready for final inspection, the Contractor shall have done a final weeding and raking of all planting areas; plant basins shall be repaired if necessary; the job site shall be cleared of all debris; and all irrigation systems shall be ready to run. The University, including the Stanford University Architect and Planning Office, Stanford LBRE Grounds Department, and Stanford Project Manager shall be notified of this inspection at least ten (10) days before the anticipated date. The inspection shall include the Contractor, Stanford Project manager, and representatives from the Stanford University Architect and Planning Office with Stanford LBRE Grounds Department (including a Certified Arborist, irrigation supervisor, grounds maintenance supervisor, and horticultural supervisor). It is the Contractor's responsibility to maintain all plant material until notification of final acceptance by the University. The University shall not accept the work until all construction and all planting has been completed in accordance with the specifications.

4. The landscape contractor shall provide as-built irrigation and planting plans including botanical names of all installed plants to the Stanford LBRE Grounds Department and the Stanford Maps and
Records Department. (This may vary from what was in the plan because of supply.)

B. Guarantee
The Contractor shall guarantee all plants for one (1) year, and shall respond within two (2) weeks of written requests by the University for replacement. If the Contractor fails to respond within this time, the University may proceed with replacement work and bill the Contractor.

END OF SECTION