SECTION 02900

PLANTING

PART 1 – GENERAL

1.01 DESCRIPTION

A. Section includes requirements for landscaping, including furnishing and installing topsoil, soil amendments, mulch, trees, shrubs, groundcovers, tree staking, and header boards.

1.02 REFERENCE STANDARDS

A. American National Standards Institute (ANSI):

1. Z60.1 American Standard for Nursery Stock

B. ASTM International (ASTM International):

1. A641 Specification for Zinc-Coated (Galvanized) Carbon Steel Wire

2. D5268 Specification for Topsoil Used for Landscaping Purposes

1.03 DEFINITIONS

A. Balled and Burlapped Stock: Exterior plants dug with firm, natural balls of earth in which they are grown, with ball size not less than sizes indicated. Stock shall be wrapped, tied, rigidly supported, and drum-laced conforming to the requirements in ANSI Z60.1.

B. Container-Grown Stock: Healthy, vigorous, well-rooted exterior plants grown in a container with well-established root system reaching sides of container and maintaining a firm ball when removed from container. Container shall be rigid enough to hold ball shape and protect root mass during shipping and be sized according to ANSI Z60.1 for kind, type, and size of exterior plant required.

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

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

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

1.04 SUBMITTALS

A. Submit product data for each type of product.

B. Samples for verification for each of the following:

1. One pound of bark mulch in labeled plastic bags

C. Submit certificates of compliance for each type of manufactured product, signed by product manufacturer, certifying the following:

1. Manufacturer's certified analysis for standard products

2. Analysis of other materials by a recognized laboratory conforming to methods established by the Association of Official Analytical Chemists, where applicable.

D. Material test reports for existing surface soil, imported topsoil, and soil amendments. Include laboratory reports for topsoil including analysis and recommendation.

E. Qualification data for landscape installer and soil-testing laboratory.

F. Maintenance instructions listing recommended procedures to be established by the Owner for maintenance of exterior plants during a calendar year; submit before expiration of required maintenance periods.

1.05 DELIVERABLES

A. Planting schedule indicating anticipated planting dates for exterior plants. Coordinate planting schedule with Progress Schedule.

1.06 QUALITY ASSURANCE

A. Installer Qualifications: A qualified landscape installer whose work has resulted in successful establishment of exterior plants. Installer shall possess a State of California Landscape Contractor's license and meet the State of California Licensing Requirements for the application of herbicides.

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

C. Soil-Testing Laboratory Qualifications: An independent laboratory recognized by the State Department of Agriculture with the experience and capability to conduct the testing indicated and that specializes in types of tests to be performed.

D. Pre-Installation Conference: Conduct pre-installation conference at project site. Schedule conference in coordination with the Engineer. Attendees shall include Contractor, planting installer, landscape irrigation installer, and the Engineer.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Deliver exterior plants freshly dug.

B. 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.

C. Handle planting stock by root ball.

D. Deliver exterior plants after preparations for planting have been completed and install immediately. If planting is delayed more than 6 hours after delivery, set

exterior plants and trees in shade, protect from weather and mechanical damage, and keep roots moist.

1. Do not remove container-grown stock from containers before time of planting.

2. Water root systems of exterior plants stored on-site with a fine-mist spray. Water as often as necessary to maintain root systems in a moist condition.

E. Store fertilizers and soil amendments in a dry place and protect from intrusion of moisture.

1.08 COORDINATION

A. Coordinate installation of planting materials during normal planting seasons for each type of plant material required.

B. Proceed with planting only when existing and forecasted weather conditions permit.

1.09 WARRANTY

A. Refer to General Provisions GP4.3, Guaranty of Work. The Guaranty of Work shall include the following provisions in regard to planting including plant materials.

1. Warrant against defects including death and unsatisfactory growth, except for defects resulting from lack of adequate maintenance, neglect, or abuse by Owner, or incidents that are beyond the Contractor's control.

2. Remove dead exterior plants immediately, and replace immediately unless required to plant in the succeeding planting season.

3. Replace exterior plants that are more than 25 percent dead or in an unhealthy condition at end of warranty period.

4. A limit of one replacement of each exterior plant will be required, except when losses or replacements are due to failure to comply with requirements.

1.10 MAINTENANCE

A. Maintenance Period: 12 months from date of Substantial Completion.

B. Trees and Shrubs: Perform maintenance throughout the maintenance period including pruning, cultivating, watering, weeding, fertilizing, restoring planting saucers, tightening and repairing stakes and guy supports, and resetting to proper grades and vertical position as required to establish healthy, viable plantings. Spray as required to keep trees and shrubs free of insects and disease. Restore or replace damaged tree wrappings.

C. Ground Cover and Plants: Perform maintenance throughout the maintenance period including watering, weeding, fertilizing, and other operations as required to establish healthy, viable plantings:

PART 2 - PRODUCTS

2.01 GENERAL

A. Provide quality, size, genus, species and variety of exterior plants indicated conforming to the requirements in ANSI Z60.1.

B. Selection of exterior plants shall be made in conjunction with the Engineer, who will witness tagging plants at their place of growth before they are prepared for transplanting.

C. Measure trees and shrubs according to ANSI Z60.1 with branches and trunks or canes in their normal position. Do not prune to obtain required sizes. Take caliper measurements 6 inches above ground for trees up to 4-inch caliper size, and 12 inches above ground for larger sizes. Measure main body of tree or shrub for height and spread; do not measure branches or roots tip-to-tip.

D. The Engineer may observe trees and shrubs either at place of growth or at site before planting for compliance with requirements for genus, species, variety, size, and quality. The Engineer retains the right to observe trees and shrubs further for size and condition of balls and root systems, insects, injuries and latent defects, and to reject unsatisfactory or defective material at any time during progress of work. Remove rejected trees or shrubs immediately from the project site.

1. Notify the Engineer of sources of planting materials 7 days in advance of delivery to site.

2. Make no plant substitutions.

2.02 TREE AND SHRUB MATERIAL

A. Furnish nursery-grown trees and shrubs conforming to the requirements in 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.

B. Provide trees and shrubs of sizes and grades conforming to the requirements in ANSI Z60.1 for type of trees and shrubs required. Trees and shrubs of a larger size may be used if acceptable to the Engineer with a proportionate increase in size of roots or balls.

C. Label each tree and shrub with securely attached, waterproof tag bearing legible designation of botanical and common name.

D. If formal arrangements or consecutive order of trees or shrubs is shown, select stock for uniform height and spread, and number label to assure symmetry in planting.

2.03 SHADE AND FLOWERING TREES

A. Shade Trees: Single-stem trees with straight trunk, well-balanced crown and intact leader, of size indicated, conforming to the requirements in ANSI Z60.1 for type of trees required.

1. Branching height shall be 1/3 to 1/2 of tree height

2. Provide container-grown trees

B. Small Upright or Spreading Trees: Branched or pruned naturally according to species and type, with relationship of caliper, height and branching conforming to the requirements in ANSI Z60.1.

1. Stem form shall be multi-stem, clump, with 2 or more main stems

2. Provide container-grown trees

2.04 GROUND COVERS

A. Provide ground cover of species indicated, established and well-rooted in pots or similar containers, conforming to the requirements in ANSI Z60.1.

2.05 TOPSOIL

A. Topsoil shall conform to the requirements in ASTM D5268, pH range of 6.0 to 6.8, fertile, friable, natural topsoil of sandy loam character, without admixture of sub-soil material, obtained from a well drained arable site, reasonably free from clay, lumps, coarse sands, stones, plants, roots, sticks and other foreign materials.

1. Identify source location of topsoil proposed for use in the Work.

2. Provide topsoil free of substances harmful to the plants which will be grown in the soil.

B. Furnish topsoil analysis by a qualified soil-testing laboratory stating percentages of organic matter; gradation of sand, silt, and clay content; cation exchange capacity; deleterious material; pH; and mineral and plant-nutrient content of topsoil.

1. Include suitability of topsoil for plant growth. State recommended quantities of nitrogen, phosphorus, potash nutrients and soil amendments to be added to produce satisfactory topsoil.

2.06 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 one-inch sieve; soluble salt content of 5 to 10 decisiemens/m; not exceeding 0.5 percent inert contaminants and free of substances toxic to plantings; and the following:

1. Organic Matter Content: 50 to 60 percent of dry weight

2. Feedstock: Agricultural, food, or industrial residuals; biosolids; yard trimmings; or source-separated or compostable mixed solid waste

B. Peat: Sphagnum peat moss, partially decomposed, finely divided or granular texture, with a pH range of 3.4 to 4.8.

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

1. In lieu of decomposed wood derivatives, mix partially decomposed wood derivatives with at least 0.15 lbs of ammonium nitrate or 0.25 lbs of

ammonium sulfate per cubic foot of loose sawdust or ground bark.

D. 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.

2.07 FERTILIZER

A. 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. Nitrogen, phosphorous and potassium in amounts recommended in soil reports from a qualified soil-testing agency.

B. Slow-Release Fertilizer: Granular or pelleted fertilizer consisting of 50 percent water-insoluble nitrogen, phosphorus and potassium in the following composition:

1. Nitrogen, phosphorous and potassium in amounts recommended in topsoil analysis.

2.08 PLANTING SOIL

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

2.09 MULCHES

A. Organic mulch shall be free from deleterious materials and suitable as a top dressing of trees and shrubs, consisting of one of the following:

1. Medium fir bark or wood chips

2. Rock mulch: As specified in the Contract Documents

2.10 STAKES

A. Metal Stakes for 15 gallon can and 24 inch box trees: Schedule 40 steel, 9-foot length, 3/4 inch diameter, with screw in auger-type tip, adjustable height 'T'-bar, UV-resistant vinyl tubing, 3 cable ties, anti-rotational tab and pin, powder coated black. As available from Decorations for Generations, Inc. Guy and Tie Wire: Conform to ASTM A641, Class 1, galvanized-steel wire, 2-strand, twisted, 0.106-inch in diameter.

2.11 MISCELLANEOUS PRODUCTS

A. Anti-desiccant: Water-insoluble emulsion, permeable moisture retarder, film forming for trees and shrubs. Deliver in original, sealed and fully labeled containers and mix according to manufacturer's written instructions.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine areas to receive exterior plants for compliance with requirements and

conditions affecting installation and performance. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 PREPARATION

A. Protect structures, utilities, sidewalks, pavements and other facilities, and lawns and existing exterior plants from damage caused by planting operations.

B. Refer to Section 01560, Temporary Controls, for requirements to prevent erosion, displacement of soils, discharge of soil-bearing water runoff, and airborne dust.

C. Lay out individual tree and shrub locations, and areas for multiple plantings. Stake locations, outline areas, adjust locations when requested, and obtain acceptance of the layout by the Engineer before planting. Make adjustments as required.

D. Apply anti-desiccant to trees and shrubs using power spray to provide an adequate film over trunks, branches, stems, twigs and foliage to protect during digging, handling and transportation.

1. If deciduous trees or shrubs are moved in full leaf, spray with anti-desiccant at nursery before moving and again 2 weeks after planting.

3.03 PLANTING BED ESTABLISHMENT

A. Loosen subgrade of planting beds to a minimum depth of 8 inches. Remove stones larger than one inch in any dimension and sticks, roots, rubbish and other extraneous matter.

1. Apply superphosphate fertilizer directly to subgrade before loosening.

2. Spread topsoil, apply soil amendments and fertilizer on surface, and thoroughly blend planting soil mix.

a. Delay mixing fertilizer with planting soil if planting will not proceed within a few days

b. Mix lime with dry soil before mixing fertilizer

B. Topsoil Amendment, Topsoil Placement, and Fine Grading:

1. Place and spread topsoil to a minimum uniform thickness of 4 to 5 inches throughout areas designated to receive landscape planting, allowing for addition of amendments and plant materials, and mulch where indicated.

a. Provide imported topsoil needed to fill remainder of site planting areas to finish grade.

2. Amend new topsoil according to the following: At each 1,000 square feet or per 20 cubic yards, spread 6 cubic yards soil amendment, 15 pounds commercial fertilizer, 10 pounds soil sulfur and 10 pounds iron sulfate evenly over topsoil at rates and depths indicated, then uniformly and thoroughly incorporate into the upper 6 inches of soil to obtain a homogeneous soil mix. Topsoil shall be in a moist condition at time of mixing.

a. Amendment and fertilizer may be premixed prior to placement of

topsoil.

b. Modify quantities of soil sulfur, iron sulfate, and soil amendment in accordance with recommendations in topsoil analysis.

3. Deposit and spread topsoil using methods that will prevent excessive compaction of topsoil.

4. Provide a smooth finish grade by blading, dragging or other methods acceptable to the Engineer. Remove high spots and fill depressions. Place grades, slopes and mounds to drain as shown on the Contract Drawings.

a. Finely finish surfaces by raking smoothly and evenly, removing all exposed, extraneous matter one inch or larger in size to facilitate natural runoff. Drag areas for smooth surface.

b. Slope finish grades to drain without water pockets or irregularities (bumps or hollows). Finish grades shall meet all existing controls and shall be 3 inches below adjacent top of paving, curbs or sidewalks to allow for top dressing mulch or 5 inches below top of paving, curbs or sidewalks to allow for rock mulch. Grades shall be of uniform slope between points of fixed elevation. Establish vertical curves or roundings at abrupt changes in slope.

c. Obtain the Engineer's review and approval of finish grades prior to commencing the planting operations.

C. Restore planting beds if eroded or otherwise disturbed after finish grading and before planting.

3.04 TREE AND SHRUB EXCAVATION

A. Excavate circular pits with sides sloped inward. Trim base leaving center area raised slightly to support root ball and assist in drainage. Do not further disturb base. Scarify sides of plant pit smeared or smoothed during excavation.

1. Excavate approximately 3 times as wide as ball diameter for container-grown stock.

2. Excavate at least 12 inches wider than root spread and deep enough to accommodate vertical roots for bare-root stock.

3. If drain tile is shown or required under planted areas, excavate to top of porous backfill over tile.

B. Do not use subsoil removed from excavations as backfill. Use planting soil (see definitions).

C. Notify the Engineer if unexpected rock or obstructions detrimental to trees or shrubs are encountered in excavations. Make adjustments to location of pit in consultation with the Engineer and excavate new pit.

D. Notify the Engineer if subsoil conditions evidence unexpected water seepage or retention in tree or shrub pits.

E. If hardpan layer is encountered, drill 6-inch diameter holes into free-draining strata

or to a depth of 10 feet, whichever is less, and backfill with free-draining material.

F. Fill excavations with water and allow to percolate away before positioning trees and shrubs.

3.05 TREE AND SHRUB PLANTING

A. Set container-grown stock plumb and in center of pit or trench with top of root ball one inch above adjacent finish grades.

1. Carefully remove root ball from container without damaging root ball or plant.

2. Place planting soil mix around root ball in layers, tamping to settle mix and eliminate voids and air pockets. When pit is approximately one-half backfilled, water thoroughly before placing remainder of backfill. Repeat watering until no more water is absorbed. Water again after placing and tamping final layer of planting soil mix.

B. Apply 2 inches average thickness of organic mulch extending 12 inches beyond edge of planting pit or trench. Do not place mulch within 3 inches of trunks or stems.

3.06 TREE AND SHRUB PRUNING

A. Prune, thin and shape trees and shrubs according to standard horticultural practice.

B. 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. Shrub sizes indicated are sizes after pruning.

3.07 STAKING

A. Upright Staking and Tying: Stake trees of 2 inches through 5 inches caliper. Stake trees of less than 2 inches.

B. General: Stake or guy trees immediately after planting. Make modifications to staking procedures as required to accommodate field conditions.

1. Allow 1 to 3 inches sway in trunk or branches; do not pull tight

C. Guying and Staking: Staking (metal): Stake trees according to tree stake manufacturer's recommendations.

3.08 GROUND COVER AND PLANTING

A. Set out and space ground cover and plants as shown on the Contract Drawings. Place 12 inches apart if no other spacing is shown on the Contract Drawings.

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

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

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

E. Protect plants from hot sun and wind. Remove protection if plants show evidence of recovery from transplanting shock.

3.09 PLANTING BED MULCHING

A. Mulch backfilled surfaces of planting beds and other areas indicated.

B. Organic Mulch: Apply 2 inches average thickness of organic mulch and finish level with adjacent finish grades. Do not place mulch against plant stems.

3.10 CLEANUP AND PROTECTION

A. During exterior planting, keep adjacent paving and construction clean, and work area in an orderly condition.

B. Protect exterior plants from damage due to landscape operations, operations by other contractors and trades, and any other adjacent work. Maintain protection during installation and maintenance periods. Treat, repair, or replace damaged exterior planting.

3.11 DISPOSAL

A. Remove surplus soil and waste material, including excess subsoil, unsuitable soil, trash and debris, dispose of it in accordance with GP7.16, Disposal of Material Outside the Work Site.

END OF SECTION