ATTACHMENT A

Section 32 9300
PLANTING

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Plant material.

B. Soils testing.

C. Soil amendments.

D. Planting soil.

E. Fine grading.

F. Mulches.

G. Weed barrier (sheet mulch).

H. Integrated pest management.

I. Tree staking.

J. Root barriers.

K. Plant establishment period.

1.02 RELATED REQUIREMENTS

A. General Conditions.

B. Section 31 10 00 - Site Clearing.

C. Section 31 22 00 - Grading.

D. Section 32 84 23 - Irrigation.

1.03 REFERENCE STANDARDS

A. ANSI/ANLA Z60.1 - American Standard for Nursery Stock; 2004.

B. ANSI A300 Part 1 - American National Standard for Tree Care Operations -- Tree, Shrub and Other Woody Plant Maintenance -- Standard Practices; 2008.

C. Organic Materials Research Institute (OMRI) - Generic Materials List, https://www.omri.org/omri-lists.

D. US Composting Councils USCC Seal of Testing Assurance program (STA), www.compostcouncil.com.

E. ANSI-A300-1995 tree pruning specifications and guidelines.

1.04 DEFINITIONS

A. Plants: Living trees, plants, and ground cover specified in this Section, and described in ANSI Z60.1.

B. Weeds: Any plant life not specified or scheduled.

C. Compost: is the product of controlled biological decomposition of organic materials, often including urban plant debris and food waste. It is an organic matter resource that has the unique ability to improve the chemical, physical and biological characteristics of soils or growing media. It contains plant nutrients but is typically not characterized as a fertilizer. (Excerpted from US Compost Council , Field Guide to Compost Use)

D. Integrated Pest Management: is a holistic approach to mitigating insects, plant diseases, weeds, and other pests. It involves the use of many strategies for managing, but not eliminating pests. Integrated Pest Management (IPM) uses cultural, mechanical, physical, and biological control methods before using pesticides to control pests and diseases in the landscape. Chemical controls are applied only when monitoring indicates that preventative and non-chemical methods are not keeping pests below acceptable levels. When pesticides are required, the least toxic and the least persistent pesticide that will provide adequate pest control is applied.

E. The Organic Materials Research Institute (OMRI): is a national nonprofit organization founded in 1997 to support the organic community. OMRI reviews products to determine their suitability for producing, processing and handling organic food and fiber under the USDA National Organic Program Rule (OMRI General Materials List)

F. Pesticide: As defined in Section 12753 of the California food and Agricultural Code, a pesticide includes any of the following: “(a) Any spray adjuvant. (b) Any substance, or mixture of substances which is intended to be used for defoliating plants, regulating plant growth, or for preventing, destroying, repelling, or mitigating any pest, which may infest or be detrimental to vegetation, man, animals, or households, or be present in any agricultural or nonagricultural environment whatsoever”. Antimicrobial agents are excluded from the definition of pesticide.

G. Sheet mulching: uses a layer of paper or cardboard underneath the mulch to enhance weed suppression and soil building benefits. This layered mulch system is often used during landscape construction to optimize mulch benefits and encourage plant establishment.

H. Planting bed areas: areas that are specified to be planted shrubs and groundcover.

I. Turf areas: areas that are specified to be seeded or sodded with turf grass.

1.05 SUBMITTALS

A. See Section, 01 33 00 - Submittals, for submittal procedures.

B. No substitutions will be allowed without prior written approval of the Owner's Representative.

C. Product Data: For each of the following:
1. Pesticides and Herbicides: Manufacturer product cut sheets; Material Safety Data Sheets
2. Fertilizers: Manufacturer product cut sheets; Material Safety Data Sheets
3. Tree Staking and Tying: Manufacturer product cut sheets
4. Mulch: documentation verifying recycled content and source of material.

D. Samples for Verification: For each of the following:
1. Amendments: 1 pint minimum volume of each amendment in sealed plastic bag or container. Submittal shall be labeled with weight and source of each item. Each submittal shall represent a true sample of material to be provided at the project site.
2. Imported Planting Soils: 1 pint minimum volume of each mulch in sealed plastic bag or container. Submittal shall be labeled with weight and source of each item. Each submittal shall represent a true sample of material to be provided at the project site.
3. Mulch: 1 pint minimum volume of each mulch in sealed plastic bag or container. Submittal shall be labeled with weight and source of each item. Each submittal shall represent a true sample of material to be provided at the project site.
4. Tree Staking materials: [Insert required submittal]
5. Sheet Mulch Materials: Sample of 100% Recycled B Flute Cardboard
6. Root Barrier

E. Lab Analysis Reports: For each of the following:
1. Soil analysis report and recommendations
2. Compost technical data sheet including compost laboratory report.
3. Imported planting topsoil report and recommendations.

F. List of plant life sources.

G. Nursery certificates or invoices for each plant verifying conformance with the drawings:
1. Container size.
2. Quantity.
3. Genus, species, cultivar, variety.

H. Maintenance data: types, application frequency, and recommended coverage of fertilizer.

1.06 QUALITY ASSURANCE

A. Required Qualifications
1. Contractor must have a valid California C-27 Contractor's license authorized by the State of California.
2. Contractor shall provide evidence of sufficient experience with similar projects. Provide list including a minimum of five recently installed projects with location, date completed, owner, contact person and phone number.

3. Contractor must have assigned to the project at least one employee possessing a California State Chemical Applicator's License for the control of weeds, plant diseases and other pests.
4. Tree pruning: company specializing in pruning trees with proof of Arborist Certification.

B. Plant Material:
1. Provide plants as specified in the documents including size, genus, species and variety. Any request for substitution must be reviewed and approved by the owner's representative.
2. Reference standards for plant materials include: BFL Landscape Guidelines, American Society of Nurserymen, Manufacturers recommendations, Sunset Western Garden Book, Plants and Landscapes for Summer-Dry Climates of the San Francisco Bay Region by EBMU, California Native Plants for the Garden by Bornstein, Fross & O'Brien.
3. Plants to be inspected and approved by Landscape Architect at the place of growth or upon delivery. Such approval shall not impair the right of inspection and rejection during progress of the work. Approval by Landscape Architect shall be received in writing prior to plant installation. Plants which are contract grown shall meet or exceed all nursery standards for health and size. Plants which do not meet standards shall be rejected and the Contractor shall provide nursery grown stock as required at no additional cost to the contract.
4. Maintain plant materials in a healthy growing condition prior to and during planting operations. Contractor shall be responsible for vandalism, theft, and damage to plant material until the commencement of the maintenance period.

C. Testing Agencies: soil testing must be done by an accredited soils laboratory approved by the Owner's Representative. Laboratories that participate in the North American Proficiency Testing Program (NAPT) are recommended. See www.usual.usu.edu/napt/ for participating laboratories

1.07 SUPPLIES AND EQUIPMENT

A. Fuel conservation and low emission equipment. The Contractor will implement strategies in work operations to reduce fossil fuel consumption and emissions, such as:
1. Use hand-powered equipment when feasible.
2. Minimize use of gas-powered blowers, especially on planting beds.
3. Select smallest, most fuel efficient equipment to accomplish task.
4. Consider vehicles that operate on natural gas or biodiesel.
5. Maintain all equipment properly and keep them well tuned.
6. Emphasize employee carpooling to Project Site.

B. The Contractor shall use local products and suppliers for all other landscape items to the extent possible to minimize fuel consumption and emissions.

C. The Contractor shall use salvaged and recycled-content products as specified and is encouraged to suggest substitutions in favor of recycled content or salvaged materials where appropriate to be approved by Owner's Representative. Materials for reuse may be found by contacting the CalMax website at www.ciwmb.ca.gov or at www.stopwaste.org. For recycled content materials visit the Green Product Directory at http://accessgreen.builditgreen.org/.

D. Equipment refueling and repair. The Contractor shall refuel and repair equipment in a safe manner to protect against accidental spills. Limit refueling to specific areas on a site. Measures shall be taken to prevent, control, and clean-up spills. Clean-ups should be immediate, automatic and routine and performed by a trained staff member or a licensed cleaning company.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Deliver fertilizer in waterproof bags showing weight, chemical analysis, and name of manufacturer.

B. Protect and maintain plant life until planted.

C. Deliver plant life materials immediately prior to placement. Keep plants moist.

1.09 PROJECT CONDITIONS

A. Do not install plant life when ambient temperatures may drop below 35 degrees F, or rise above 90 degrees F.

B. Do not install plant life when wind velocity exceeds 30 mph.

1.10 WARRANTY

A. Provide one year warranty.

B. Replacements: plants of same size and species as specified, planted in the next growing season, with a new warranty commencing on date of replacement.

PART 2 - PRODUCTS

2.01 PLANT MATERIAL

A. Plants have been selected for low water use, diversity of species, appropriate spacing to reach mature size without shearing, and percent native species. Plants have also been carefully grouped into hydrozones. No substitutions will be allowed without prior written approval of the Landscape Architect.

B. Trees, shrubs and groundcovers: species and size indicated in plant schedule, grown in climatic conditions similar to those in locality of the Work.

C. The Owner or Landscape Architect reserves the right to reject any plant specimen that exhibits any or all of the following characteristics. Contractor shall replace rejected plant(s) promptly, at no additional cost to the Owner.
   1. Poor health or vigor.
   2. Broken or damaged leader.
   3. Unbalanced growth habit.
   4. Disproportionate height to width ratio based on particular species characteristics.
   5. Poor form.

6. Damaged limbs.
7. Evidence of disease or pathogens.
8. Root bound.

D. Untrue species: All plant materials, within two years following the final acceptance of the project, determined by the Owner's Representative to be untrue to the species, clone, and/or variety specified, shall be replaced by the Contractor, to the equal condition of adjacent plants at the time of replacement.

2.02 SOIL ANALYSIS REPORT AND RECOMMENDATIONS

A. Contractor shall arrange and pay for soil testing by Lucchesi Plant and Soil Consulting, LLC (408) 337-2575, or another accredited soils laboratory approved by the Owner's Representative. Laboratories that participate in the North American Proficiency Testing Program (NAPT) are recommended. See www.usual.usu.edu/napt/ for participating laboratories

B. Soil submitted for testing should be a composite of samples taken from several locations in a site. All planting soil including onsite topsoil and import soil shall be tested per requirements in this section.
   1. Take samples from 10-12 spots in each area. Imagine a line dividing the area in half lengthwise, and then divide each half into five near equal sized widths. Take samples near the middle of each subsection.
   2. At each sampling spot dig a spades width hole a least 8 inches deep, then shave a 1 inch slice from the side of the hole to use in the composite sample.
   3. Thoroughly mix the 10-12 samples from each turf or planting area together in a clean plastic bucket or bowl. Place 2 cups of the mix in a sealable plastic bag for testing (some tests may require more soil, confirm with laboratories.)
   4. Label the bag with site information area of sample plus name of person who took the sample and contact information.

C. At a minimum the soil analysis shall include:
   1. soil texture
   2. infiltration rate determined by laboratory test or soil texture infiltration rate table;
   3. pH
   4. total soluble salts
   5. sodium
   6. essential nutrients
   7. percent organic matter
   8. Recommendations- per soils analysis request that the laboratory make recommendations for amending the soil with compost to bring the soil organic matter to a minimum of 5% by dry weight and incorporating natural, non-synthetic fertilizers to recommended levels for planting area.

D. Amendment testing: Contractor shall submit a one-quart sample of each proposed amendment to Annmarie Lucchesi at Lucchesi Consulting (408) 337-2575 or another accredited soils laboratory approved by the Owner's Representative. No material shall be delivered to the site until the Landscape Architect approves the material.

E. The amendments, and fertilizer rates and quantities listed below are to be used for bid basis only. The base bid shall include cost of testing site soil and organic amendments noted in this specification section. Adjust the quantities of soil amendments and fertilizer per soil lab written report recommendation. Adjustments to project costs resulting from the soil report recommendations shall be submitted as a modification to the base bid. Submit soil lab report and any proposed soil amendments and cost adjustments to Owner's Representative for written approval. After review and written approval by the Owner's Representative, amend the soils according to said laboratory's recommendations. The approved soils laboratory recommendations shall be considered a part of this specification.

2.03 SOIL AMENDMENTS

A. Organic compost shall be determined from soils analysis results.

B. Organic compost shall be recycled from local, organic materials such as plant or wood waste.

C. For bid purposes, assume Soil Amender Compost, available from CCL Organics, (707) 751-0466 or approved equal. Application rate per 1,000 square feet: 6 cubic yards Organic Compost

D. Compost shall be well decomposed, stable and weed free. It shall be derived from one or more locally sourced orgnanic materials such as : food waste or urban plant debris, agricultural crop residue or herbivore animal manures with a preference for urban plant debris and food waste. It shall not contain mixed solid waste. The product shall contain no substances toxic to plants, will possess no objectionable odors and shall not resemble the feedstock (the original material from which it was derived). Compost shall be tested through the US Composting Councils USCC Seal of Testing Assurance Program (STA). A lab analysis shall be performed by a STA certified laboratory using the test methods used in the Seal of Testing Assurance program found in the Test Methods for Examination of Compost and Composting Manual (TMECC). Verifying current participation in the STA program can be confirmed by logging onto the USCC website at www.compostingcouncil.com. The compost lab analysis shall be submitted as part of the "Compost Technical Data Sheet" before delivery of compost.

E. The compost laboratory report **must** confirm the following compost parameters:

Parameters	**Units of Measure**	**General Range**
Nitrogen (Total N)	% dry weight	> 0.9
Ammonium (N or NH4-N)	ppm or mg/kg dry weight	< 450
Nitrate (NO3-N)	ppm or mg/kg dry weight	> 10
Phosphorus (P)	% dry weight	< 0.6
Calcium (Ca)	% dry weight	< 3.5
Boron (Total B)	ppm or mg/kg dry weight	< 80
Sodium (Na)	% dry weight	< 0.5
Total Nitrogen Phosphorus and Potassium (NPK)	Sum % dry weight	> 2.0
Carbon Nitrogen Ratio	Carbon: Nitrogen	≤ 25:1
Organic Matter Content	% by dry weight basis	> 35
pH	pH units	6.5 - 8.5

Moisture Content	% wet weight basis	> 35
Particle Size or Sieve Size	% under ½" or 25mm by dry weight	> 95%
Stability Indicator: Carbon Dioxide (C02) Evolution Rate	Mg CO2-C/g OM per day	< 8
Maturity Indicator: Cucumber Bioassay		
Seed Emergence	%, relative to control	> 80%
Seed Vigor	%, relative to control	> 80%
Select Pathogens		
Fecal Coliform Bacteria	MPN/gram dry weight	< 1,000
Salmonella	MPN/4gram dry weight	< 3
Metals		
Arsenic	mg/kg (ppm)	< 16
Cadmium	mg/kg (ppm)	< 8
Chromium	mg/kg (ppm)	< 100
Copper	mg/kg (ppm)	< 400
Lead	mg/kg (ppm)	< 100
Mercury	mg/kg (ppm)	< 4
Nickel	mg/kg (ppm)	< 80
Selenium	mg/kg (ppm)	< 5
Zinc	mg/kg (ppm)	< 500
Physical Contaminants		
Glass	% dry weight	< 1
Plastic	% dry weight	< 1
Metal	% dry weight	< 1
Bulk Density	lbs/CY dry weight lbs/CF dry weight	< 19 and < 41 < 500 and < 1,100

(Table modified from the US Composting Council Landscape Architectural Specifications 6/1/05 and Alameda County Waste Management Authority Compost Quality Standards and Testing Protocol April 6, 2006)

F. In addition it is recommended that the compost laboratory report conforms to the following compost parameters:

Parameters	**Units of Measure**	**General Range**
Boron (Soluble B)	ppm or mg/kg dry weight	< 2.5
Soluble Sodium	% of ECE	< 40
Soluble Chloride	% of ECE	< 50
Organics:		
Clyopyralid		Pass plant test
Organochlorine Pesticides		Non Detect
Organophyosphate Pesticides		Non Detect

Chlorinated Herbicides		Non Detect
Chlorinated Hydrocarbons		Non Detect

(Table modified from the US Composting Council Landscape Architectural Specifications 6/1/05 and Alameda County Waste Management Authority Compost Quality Standards and Testing Protocol April 6, 2006)

2.04 FERTILIZERS

A. Non-synthetic fertilizers as recommended by the soils report. Synthetic, quick-release fertilizers shall not be permitted. Fertilizers prohibited in the Generic Materials List by the Organic materials Review Institute (OMRI) are prohibited in the project.

2.05 IMPORT SOIL

A. Soil at groundcover and shrub areas to meet soil analysis and organic recommendations in soil report as decribed in this specification.

B. Soil at Sod areas to receive a minimum of 8"of top soil made up of a Sandy Loam available through Lyngso at San Carlos or Approved Equal. It shall meet the following physical, chemical and regulatory requirements:
   1. USDA Soil Classification Sandy Loam to have the following properties:
      a. 17% Saturation, 0.4% Organic Matter, 2.3% 5-12 coarse gravel, 4.4% fine gravel, 5.8% 1-2 very coarse sand, 14.0% 0.5-1 Coarse Sand, 28.5% .05-0.5 medium to very fine sand, 27.6% .002-.05 Silt, 24.0% 0-.002 Clay, and USDA Soil Classification Sandy Loam. Final mix to be reviewed and approved during submittal process by Landscape Architect and Owner's Representative.
   2. Import soil is available through Lyngso Garden Materials Inc, Pleasanton trucking inc, or l.h. Voss materials inc. Submit the soil report tested within 6 months for review and approval.
   3. The Contractor shall designate their proposed import sources in advance and shall provide source samples and soils test of material to the Owner’s Representative.

2.06 TOPSOIL

A. Contractor may utilize the top 4-12" of topsoil if amended per organic soil amendment recommendation from the soil report. Soil shall be free of any refuse, heavy, or stiff clay, hard dirt clods, stones larges than 1/4 inch in any dimension, roots larger than 3/4-inch diameter, litter, or other deleterious materials. In addition, the soil shall be free of noxious weeds, Bermuda grass, nut grass or other invasive wildland pest plant material, toxic amounts of boron, acid or alkaline chemicals, and shall be capable of sustaining healthy plant life. Contractor shall stockpile. Topsoil pile height shall not exceed 6 feet.

2.07 MULCHES

A. Mulch shall meet one or more of the following requirements:
   1. Provided by on-site salvaged and chipped material such as, tree trimmings, plant or clean wood waste.

2. Mulch shall be recycled from local, organic materials such as plant or wood waste.
3. Recycled Pro-Chip Decorative Mulch. Provide color options for approval by District. Available from Newby Island Resource Recovery Park (408) 945-2800 or approved equal.

3

B. Rock mulch: northeast corner of site near labrynth to received 3/4" angular Arles Grey Pathway rock mulch available from American Soil and Stones or approved equal. See plans for specific location.

2.08 WEED BARRIER (SHEET MULCH) CARDBOARD

A. Cardboard for sheet mulch shall be 100% recycled B flute cardboard or approved equal. Rolls of recycled cardboard are available through North Bay Paper in Petaluma, 800-734-2772 or Monahan Paper in Oakland, 510-835-4670 or approved equal.

2.09 INTEGRATED/ORGANIC PEST MANAGEMENT

A. Integrated Pest Management (IPM) practices shall be used to control pests and diseases in the landscape.

B. Synthetic pre emergents are prohibited.

C. Pesticides that are not allowed by OMRI in its generic materials list are prohibited.

2.10 TREE STAKING MATERIALS

A. Staking Materials:
1. Stakes: Lodgepole pine (untreated), 3-inch diameter by 10 feet long minimum actual dimensions, of uniform size and pointed at one end.
2. Ties: Spring-loaded “Wonder Tree Ties” by Alden Enterprises (818) 579-7115, recycled bicycle innertube or approved equal.

2.11 ROOT BARRIER

A. Root Barrier: Black, molded, modular panels manufactured with 50 percent recycled polyethylene plastic with ultraviolet inhibitors, 85 mils thick, with vertical root deflecting ribs protruding 3/4 inch out from panel, and each panel 24 inches wide. 10' min. length per tree.
1. "UB 24" by DeepRoot or approved equal.

3

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine site and verify that lines, levels, and grades are acceptable, and condition of existing soil is ready to receive work.

B. Examine site and verify all dimensions and quantities. In the event of a discrepancy, immediately notify the District's Representative.

C. Inspect trees, shrubs, groundcovers, and vines for injury, insect infestations, and proper pruning.

D. Start of work shall indicate Contractor's acceptance of existing conditions.

3.02 SOIL PREPARATION AND FINISH GRADING

A. Amend Existing Site Soil:
   1. Test soil per requirements of this section.
   2. Scarify or till subsoil or topsoil subgrade to a depth needed to achieve 12” of loosened soil after amendment is placed. Entire surface should be disturbed by scarification. Do not scarify or till within drip line of existing trees to be retained. Do not scarify or till when soil is wet.
   3. Amend to meet required organic matter content: Apply non-synthetic fertilizers and other amendments, including appropriate quantities of compost to bring soil organic matter content to requirement, as specified in the soils analysis report, to the surface of the aerated soil/subgrade. For bid purposes assume 2” quality compost applied to all areas to receive planting. Mix to the depth required to achieve 8 inches of settled soil/amendment mix.
   4. Rake beds to smooth and remove surface rocks larger than 1 inch diameter. Grade soil surface at edges of planting areas within 2’ of adjacent to hardscape and drain inlets to an elevation of 3-4” below the finished surface of adjacent hardscape to allow adequate room for mulch.

B. Imported planting topsoil
   1. Scarify or till subgrade to 6” to achieve 12” of loosened soil after topsoil and amendment are placed. Entire surface should be disturbed by scarification. Do not scarify within drip line of existing trees to be retained. Do not scarify when soil is wet.
   2. Place 6” of imported planting topsoil as specified in 3” lifts. Mix each lift into 2” of soil below it.
   3. Rake beds to smooth and remove surface rocks larger than 1inch diameter. Grade soil surface at edges of planting areas within 2’ of adjacent hardscape and drain inlets to an elevation of 3-4” below the finished surface of adjacent hardscape to allow adequate room for mulch.

C. Finish Grading:
   1. Rake beds to smooth and remove surface rocks larger than 1inch diameter.
   2. Grade soil surface at edges of planting areas within 2’ of adjacent hardscape and drain inlets to an elevation of 3-4” below the finished surface of adjacent hardscape to allow adequate room for mulch.

3.03 WEED BARRIER (SHEET MULCH)

A. After the soil preparation has occurred and 5 gallon and larger plant materials have been planted the sheet mulch shall be installed as shown in the Drawings.

B. Apply a minimum of two layers of 100% recycled B flute cardboard as a biodegradable weed barrier to the entire planting area, completely covering all existing soil and remaining herbaceous vegetation, if any.
   1. Wet cardboard while applying to prevent it from blowing away.
   2. Sheets of cardboard shall overlap a minimum of 8".
   3. Cardboard shall abut directly against edge of pavement, curbs, boulders or other site features.
   4. Cardboard shall be applied to the edge of installed plant root balls without covering any part of the top of the root ball/root crown area.
   5. Excess cardboard shall be folded under itself when abutting against hardscape objects or root crowns areas, as opposed to being cut, avoid excessive cardboard scraps. This folding under process is greatly aided when the cardboard is wet.
   6. All cardboard scraps shall remain separated from other construction debris and shall be disposed at the local recycling facility.
   7. Install drip irrigation over the cardboard layer.

C. Apply compost and mulch
   1. Apply 1" of compost as specified by the soils report on top of the cardboard layer in all planting areas. Reduce compost application to ½" when 6" or less from the edge of curb.
   2. Apply 2" of mulch on top of the compost to obtain a 3 inch minimum depth of combined compost and mulch above the cardboard. Mulch will protect compost during the planting of 1 gallon and 4" pots and the laying out of drip lines.
   3. Keep root crowns of all plants clear of compost, mulch and debris.

D. After the mulch and compost has been applied punch a hole through the cardboard and place plants smaller than 5 gallon in soil under sheet mulch. Smaller plants can be planted directly into sheet mulch layer.

3.04 TREE, SHRUB, GROUNDCOVER AND VINE PLANTING

A. Adjustments to plant placement and spacing shall be reviewed and approved in the field by the Landscape Architect.

B. Incorporate compost with excavated soil from the plant pit at a ratio of 1 part compost to 2 parts soil, or as recommended by the soils report.

C. Include other amendments as specified and as recommended by the soils report.

D. Place plants for best appearance for review and final orientation by Owner or Landscape Architect.

E. Locate trees per plan and a minimum of 3' from walls, overheads, walks, headers, and other trees within the project. If conflicts arise between size of areas and plans contact District's representative immediately.

F. Loosen sides and bottoms of plant pits prior to placing trees, shrubs, groundcovers, and vines. Sides of plants pits to be vertical.

G. When excavating plant pits if rocks, underground construction work, tree roots, or other unknown obstructions are encountered immediately contact District's representative.

H. Conduct percolation testing by filling full sized plant pits with water and observing in 24 hours. Notify District's representative if planting pit has not fully drained before proceeding with planting in all areas not draining.

I. Set plants vertical in center of plant pit.

J. Remove non-biodegradable containers, burlap, ropes, and wires from the root ball.

K. Set plants in the ground so that the root ball will be flush with the finish grade. All plants that settle below the finish grade within 30 days of acceptance of work shall be replanted in the proper position.

L. Saturate soil with water when the pit or bed is half full of topsoil and again when full.

3.05 TREE STAKING

A. Brace trees and large shrubs 15-gallon container size and larger with plant protector wrapped guy wires and stakes to the following:
1. Tree caliper: Up to 1 inch - one stake with one tie.
2. Tree caliper: 1 to 2 inches - two stakes with two ties.
3. Tree caliper: 2 to 4 inches - three guy wires with eye bolts and turnbuckles.
4. Tree caliper: Over 4 inches - four guy wires with eye bolts and turnbuckles.

3.06 ROOT-BARRIER INSTALLATION

A. Root barriers shall be installed where trees are planted within 48” of paving or other hardscape elements such as walls, curbs, and walkways unless otherwise shown on drawings. Root barriers shall be installed in a linear fashion along hardscape edge and shall not wrap around tree root ball. Install per manufacturers instructions.

3.07 MAINTENANCE PERIOD

A. Duration: Contractor shall furnish all labor, material, equipment, and services required to maintain the landscape in a healthy and attractive condition for a period of no less than 90 days from the acceptance of the Work by the District.

B. Pruning
1. Selective pruning: Plants shall be pruned selectively to remove individual stems or branches that extend beyond the natural conformation of the plant to a lateral branch or at the point of attachment. Woody groundcovers shall be selectively pruned to control growth towards pavements rather than edged.
2. Hedging and shearing: Contractor shall not sheer plants into formal shapes as this destroys the natural form of the plant and generates excessive waste.
3. Tree pruning shall be performed only by trained, experienced personnel. An I.S.A. Certified Arborist or Tree Worker is to be present at all times during pruning.

C. Re-incorporate onsite leaves and plant debris less than 4 inches in size into the mulch layer of landscaped areas away from storm drains.

D. Separate plant debris, which is not re-incorporated onsite, from other waste and take to facility where it will be used to produce compost or mulch. Exempt materials include palm fronds, cactus and poison oak as defined by local regulations.

E. Grassycling - Leave grass clippings on lawn after mowing from April through October. Exceptions include:
   1. Sports turf "in season" when clippings will interfere with play.
   2. Unseasonal rain, which may require temporary halting of grasscycling because of excessive moisture.
   3. When grass is too tall to leave long clippings on lawn.

F. If grass clippings cannot be grasscyled due to above conditions, clippings must be used as mulch, composted, or transported to a compost facility. Do not use grass clippings as mulch if an herbicide has been applied to the turf.

G. Protect soil from compaction. Soil may not be worked when wet, generally between October and April. Throughout the year when temporary vehicular access is needed over non-paved areas, distribute the load over the soil with 6 inches of coarse organic mulch or reusable planks.

H. Soil subsidence: Fill in any soil subsidence that may occur, replant trees and or shrubs that may have settled.

I. Adjust and repair tree staking materials.

J. Water Management. All plants shall be irrigated to provide adequate water to maintain an attractive, green, healthy and moderate growth rate during its growing season. The Contractor shall comply with the water budget approach to irrigation scheduling to match plant need with water application and avoid over-irrigation.

K. Mulching: Contractor shall maintain a minimum of 3 inches of mulch at all times over soil surface that is not covered by vegetation. Keep mulch 6 inches away from tree trunks and 4 inches away from shrub stems. Mulch shall be reapplied at least once per year. Restore plant basins.

L. Quality, organic compost must be used as the soil amendment for all landscape areas. Compost must meet all requirements in this specification.

M. Use only organic fertilizers and amendments during the project's construction and establishment phases. Acceptable products are those allowed for use in crop production by at least one of the following:
   1. Organic Materials Review Institute's Generic Materials List
   2. California Department of Food and Agriculture's Organic Input Materials Program
   3. U.S. Department of Agriculture's National Organic Program

N. Monitor and maintain the irrigation system in full operable condition:

1. Assess the irrigation system while it is in operation, at every visit during the watering season.
2. Repair all malfunctioning equipment prior to the next scheduled irrigation.
3. Ensure that all replacement parts are of the same manufacturer, type, and application rates as existing, or that the parts are approved equals or upgrades.
4. Submit to the Owner or property manager monthly documentation of irrigation checks and note any changes or adjustments to the system on 'as built' irrigation plans.

O. Utilize Integrated Pest Management per this specification.

P. Utilize Organic Pest Management. Pesticides that are not allowed by OMRI in its generic materials list are prohibited.

Q. Perform other operations as required to establish healthy viable plantings.

3.08 INTEGRATED PEST MANAGEMENT

A. Contractor shall utilize integrated pest management (IPM) practices during installation and maintenance to control pests and disease in the landscape. IPM uses cultural, mechanical, physical, and biological control methods before using pesticides. Chemical controls are applied only when monitoring indicates that preventative and non-chemical methods are not keeping pests below acceptable levels. When pesticides are required, the least toxic and the least persistent pesticide that will provide adequate pest control is applied. Refer to BFL Guidelines and Maintenance Specification for more information.

B. Controls
   1. Cultural/Mechanical/physical methods will be used as the first choice in weed management.
      a. Monitor planting areas frequently to identify and eradicate weeds early in the growth stage prior to their setting seed.
      b. Cut or pull weeds using hand operated equipment where possible.
      c. Mulches shall be maintained at all times over soil surface that is not covered by vegetation.
      d. Propane-fueled flamers may be used in winter and spring with required permits and approval by the Fire Marshall to kill early-season, non-grass weeds by heating the cells until they burst.

C. With prior written approval from the District, Contractor shall apply all chemicals in a safe manner and according to label instructions and Agency, State and Federal requirements. A California Chemical Applicators license is required by the Contractor for chemical applications. The Contractor shall mix and apply chemicals to protect against accidental spills and drift to non-target areas, and to insure safety of the applicator. Any spilled chemicals, as well as contaminated soil, water, and/or landscape materials must be removed from the Project and disposed of in accordance with the Agency requirements. The Contractor shall maintain applicator's licenses and records of applications as required by the State.

D. A Chemical Work Report shall be completed for each chemical application. The Contractor is responsible for submitting chemical usage reports to the County Agricultural Department.

1. Contractor shall maintain records of all pest management activities. Each record shall include the following information:
   a. target pest;
   b. type and quantity of pesticide used;
   c. site of the pesticide application;
   d. date the pesticide was used;
   e. name of the pesticide applicator;
   f. application equipment used;
   g. prevention and other non-chemical methods of control used.
2. Contractor shall submit the pest management record to Owner on monthly basis.

E. Herbicides
1. Least toxic herbicides may be employed by Contractor as a last resort. Trade names are used only as examples and are not intended as an endorsement. Examples are:
   a. Fatty acid potassium salts (herbicidal soaps e.g. *Safer's Superfast Weed and Grass Killer®, Dr. Bronner's Peppermint Anti-Bacterial Soap*)
   b. Acetic and citric acids (e.g. *Nature's Glory Weed and Grass Killer RTU®*)
   c. Clove, citrus, mint and thyme oil (e.g. *Matran II®, Xpress®*)
   d. Corn gluten
   e. Low-toxic, low-residual herbicide, e.g. glyphosate, (*Round-up®*), glufosinate-ammonium (*Finale®*), pelargoic acid (*Scythe®*)
2. Restricted herbicides that may not be used because they have been identified as ground water contaminants are (trade names in parentheses):
   a. Atrazine (*Aatrex*)
   b. Simazine (*Princep*)
   c. Bromacil (*Hyvar, Krovar*)
   d. Prometon (*Pramitol*)
   e. Bentazon (*Basagran*)
   f. Norflurazon (*Solicam, Predict, Zorial*)
3. Restricted herbicides that may not be used because they have been identified as a compost contaminant are:
   a. Picloram
   b. Clopyralid

3.09 CLEANUP AND PROTECTION

A. Contractor shall exercise caution to avoid washing or sweeping dirt and debris into the storm drain system.

B. Wash dust and other miscellaneous construction matter from foliage.

3.10 DISPOSAL

A. Recycle all waste per Construction and Demolition waste requirements elsewhere in these specifications. Reuse or return unused items such as palettes, flats and pots. All plant debris shall be separated from other refuse and taken to a facility where it will be recycled i.e., to produce compost or mulch. Reuse or donate unused construction materials such as plant containers to donation organization such as ReStore, Oakland (510) 777-1447.

END OF SECTION