

**SECTION 02910 – TREE PLANTING****PART 1 - GENERAL****1.01 DESCRIPTION**

- A. Work Included: Furnish all labor, material, equipment and services necessary to provide all Tree Planting, complete in place, as shown and specified herein, including soil preparation, staking and clean-up. Contractor's bid shall include all materials and services referenced in the Drawings and these Specifications, and shall be responsible for review and completion of the specification instructions herein.
- B. Related Work:
  - 1. Palm Planting - Section 02940.
  - 2. Landscape Maintenance - Section 02975.
- C. Any tree deemed 'Not Available' shall be noted in the bid. Failure to qualify availability of specified material shall require the Contractor be responsible for supplying all material. Landscape Maintenance period may not begin until all specified materials are installed.

**1.02 REFERENCES**

- A. American Society for Testing and Materials (ASTM International):
  - 1. ASTM D422 Standard Test Method for Particle-Size Analysis of Soils
  - 2. ASTM D2434 Standard Test Method for Permeability of Granular Soils (Constant Head)
- B. Council of Tree and Landscape Appraisers:
  - 1. Manual for Plant Appraisers Handbook, Guide for Establishing Values of Trees and Other Plants.
- C. State of California Agricultural Code
- D. Sunset Western Garden Book
  - 1. Sunset Publishing Corporation, 2007 Edition
- E. U.S.A. Standards for Nursery Stocks
  - 1. American Nursery & Landscape Association, ANSI Z60.1-24

**1.03 QUALITY ASSURANCE**

- A. Work Force
  - 1. Experience: The landscape installation firm shall provide at least one English-speaking person full time assigned to the job for the duration of the contract. He shall have a minimum of fifteen (15) years experience in public works projects and shall be experienced in landscape installation supervision, with experience or

training in tree maintenance, entomology, pest control, soils, fertilizers, and tree identification.

2. Supervision: The foreman shall directly employ and supervise the work force at all times. Notify the Owner's Authorized Representative of all changes in supervision. The foreman shall:
  - a. Demonstrate experience as a grower/supplier and licensed (C27) installer of specimen trees, 10 years experience minimum.
  - b. Provide references and contacts for 3 similar projects, which include a minimum of 25 specimen Palms, in the last 3 years.
  - c. Substantiate bid with documented work plan and schedule for obtaining specimen trees, per specification.
  - d. Provide a history and methodology for installing specimen palm trees and standard trees.
3. Labor Force: The landscape installation firm's labor force shall be thoroughly familiar and trained in the work to be accomplished and perform the task in a competent, efficient manner acceptable to the Owner's Authorized Representative.
4. Nursery Qualifications: Company specializing in growing and cultivating the trees with a minimum of three (3) years of documented experience.
5. Installer Qualifications: Company specializing in installing and planting trees with a minimum of six (6) years of documented experience.
6. Tree Pruner Qualifications: Company specializing in pruning trees with proof of Arborist Certification and a minimum of five (5) years of documented experience.
7. Tree Pruning: NAA - Pruning Standards for Shade Trees.
8. Maintenance Services: Performed by installer.
9. Identification: Provide proper identification at all times for landscape installation firm's labor force. Be uniformly dressed in a manner satisfactory to the Owner's Authorized Representative.

B. Tree Planting Materials:

1. All trees shall be observed and approved by the Owner's Authorized Representative for quality, size and variety prior to installation. Trees shall be subject to observation and preliminary acceptance by the Owner's Authorized Representative at the Nursery or place of growth, and upon delivery for compliance with these specifications. Such observation shall not impair the right of observation and rejection during progress of the work. Tagging of trees by the Owner's Authorized Representative is for design intent only and does not constitute the Owner's Authorized Representative's approval of the trees in regards to their size and condition of root ball or root mass, latent defects, diseases, pests, injuries, health and vigor. The health and vigor of the trees are the sole responsibility of the Contractor. Any trees with girdling roots will be

rejected and removed from the site. Materials on the project site that have not been approved may be rejected, removed, and replaced at Contractor' expense.

C. Observations:

1. All project tree planting materials will be observed per guidelines below. The Contractor shall schedule Observations after submittal information and materials indicated have been reviewed by the Owner's Authorized Representative as listed herein after. Observation by the Owner's Authorized Representative shall not relieve the Contractor of completing the work in conformance with the Contractor Documents.
2. Observations of Tree Materials at the Nursery:
  - a. A maximum of one (1) observation for approval of all tree materials will be made by the Owner's Authorized Representative at the nursery where the contractor shall present all trees and no less than 50% of the total of required trees.
  - b. Notify the Owner's Authorized Representative at least seven (7) working days in advance of the time of observation. Submit a written request with a date, time and location of Nursery Observation with Owner's Authorized Representative, Contractor shall state the quantity of trees to be observed with "total available per nursery for all varieties of trees to be reviewed". The Owner's Authorized Representative reserves the right to refuse observation at this time if in his judgment a sufficient quantity of trees is not available for inspection.
  - c. Landscape Contractor shall be present at all Nursery Observations.
  - d. If more than one nursery is visited during the Observation, the nurseries or nursery yards shall be within 35 miles of each other. If the distance between nurseries/nursery yards is more than 35 miles or more than one Nursery Observation is needed due to but not limited to the rejection of materials reviewed, Landscape Contractor shall make a formal request in writing with a noted agreement to pay the Owner's Authorized Representative at the contractual hourly rate to attend.
3. Observations of trees on-site:
  - a. If any defective or non-complying trees are found during observations, they will be rejected.
  - b. All rejected trees shall be removed from the project site within a minimum of two working days.
  - c. On-site Observations by the Owner's Authorized Representative will be made at substantial completion of all materials, construction and installation work required by the Contract Documents prior to commencement of the Landscape Maintenance Period. Pre Site Visit List shall be verified as reviewed and completed by the contractor before a Punch walk is scheduled. List shall be requested from Landscape Architect. The Landscape Maintenance period shall not commence until all deficiencies found by this observation have been corrected and written notice of start of commencement has been received from the Owner's

Authorized Representative. All materials shall be installed prior to this observation with the following exceptions:

- 1) Items waived by the Owner's Authorized Representative for this observation for reasons of substantiated unavailability, or in appropriate season or weather.
  - 2) Items which do not affect the health or growth of the trees.
- d. When observations are conducted by someone other than the Owner's Authorized Representative, show evidence in writing of when and by whom these observations were made.
- e. No observations or site visits shall commence without the completing of all items listed or noted in previous Observation Reports either completed or remedied unless such compliance has been waived by the Owner's Authorized Representative. Failure to accomplish punch list tasks or prepare adequately for requested observations shall make the Contractor responsible for reimbursing the Owner's Authorized Representative at his current billing rates per hour (plus transportation costs). No further observations shall be scheduled until this charge has been paid and received.

D. Workmanship: Observation of site at critical stages of work.

1. Observation for approval of landscape finish grading and soil preparation before installation of trees:
  - a. During this observation the Owner's Authorized Representative may request that samples of the prepared soil be analyzed by an approved laboratory to assure its compliance with these Specifications.
  - b. Notification of exception shall be to correct deficiencies in the soil preparation to render it in compliance with these specifications. Corrections shall be made prior to any tree planting or at the Owner's Authorized Representative's option, the installation of boxed trees may proceed if the corrections can be made later without affecting the quality of the work. Notify the Owner's Authorized Representative in writing when the deficiencies have been corrected.
  - c. Periodic observation shall be made of the Contract Document work during tree establishment period.

E. Site Soil Quality Control:

1. Soil Testing: All soil tests to be conducted by Wallace Laboratories, 365 Coral Circle, El Segundo CA 90245, Ph. (310) 615-0116, Fax (310)640-6863. Tests will take place 1) for all imported soils at source prior to delivery; 2) for all imported soils upon delivery to the site, but prior to placing in planting areas; 3) all on-site soils tested before soil amending; and 4) all on-site soils after soil amending. Cost for these services will be paid for by the Contractor. Anticipate 3 weeks for completion of each round of testing. Copies of tests shall be submitted to the Owners Authorized Representative review and approval. Tests shall include the following:

2. Must include pH measurement in the Saturation Extract, Electroconductivity of the saturation extract and Sodium Adsorption Ratio of the saturation extract. The approved procedures are the following:
  - a. pH Method 21
  - b. Saturation Extract Method 2
  - c. Sodium Adsorption Ratio Method 20b
  - d. Methods of the United States Salinity Laboratory as published in the Agricultural Handbook Number 60 entitled "Diagnosis and Improvement of Saline and Alkali Soils".
3. The following nutrients and elements must be determined with an approved extraction method. Interpretation data must be given citing concentrations which are considered to be low, medium and high: boron, calcium, copper, iron, magnesium, Manganese, molybdenum, phosphorus, potassium, sodium, sulfur, and zinc.
4. The approved methods are those cited by the Council on Soil Testing and Plant Analysis and those methods currently used by soil scientists and agronomists and published in *Communications in Soil Science and Plant Analysis*, *Soil Science and Soil Science Society of America Journal*. Approved methods are Mehlich Number 3, Bray P1, Bray P2, Olsen P, DTPA, ammonium acetate, ammonium bicarbonate-DTPA, with hot water extract for boron.
5. The saturated extract must be analyzed for calcium, magnesium, sodium, boron, chloride, nitrate, and sulfate.
6. The following trace metals must be measured by the DTPA extract: Aluminum, arsenic, cadmium, chromium, cobalt, lead, lithium, nickel, selenium, silver, strontium, tin and vanadium.
7. The presence of calcium carbonate and/or magnesium carbonate must be determined by commonly used methods.
8. Soil Texture and Organic Matter content may be estimated or determined by commonly used methods. Interpretation of nutritional deficiencies or excesses and potential toxicities must be given.
9. If required, determine the following by methods approved by the American Society of Agronomy as published in the *Methods of Soil Analysis*, methods of the United States Salinity Laboratory as published in the Agricultural Handbook Number 60 entitled "*Diagnosis and Improvement of Saline and Alkali Soils*," and bulk density of clods by the method published in *Soil Science*, vol 155, 325-330 (1993):
  - a. Exchangeable Ammonium cation
  - b. Base Saturation
  - c. Cation Exchange Capacity
  - d. Carbonates Determination

- e. Soil Bulk Density (Compaction)
- f. Sand, Silt and Clay determination
- g. Water Infiltration Rate
- h. Elemental determinations to be made according to methods approved by the EPA or by the American Society of Agronomy.
  - 1) Growth Test for Toxic Constituents and/or Poor Physical Properties Grow a dicot plant species and a monocot species with and without activated charcoal. Measure yield and percent of germination for all treatments. Report conclusions and findings.
  - 2) Method published in *Soil Science*, vol 155, 325-330 (1993):

F. Certifications:

- 1. Submit a certificate of delivery slip with each delivery of material in containers or in bulk. Certificates shall state source, quantity, or weight, type and analysis and date of delivery.

1.04 SUBMITTALS

A. Submittals for review during construction phase:

- 1. Submit proposed tree planting schedule indicating anticipated dates for each type of landscape work. Once accepted, revise schedule only as approved in writing.
- 2. Submit documentation to the Owner's Authorized Representative within 45 calendar days after date of award of Contract that all trees are available. Include the nursery source for all Contractor-furnished materials. The Contractor shall be responsible for all material listed on the tree legend. Any and all substitutions due to availability shall be requested in writing prior to confirmation of ordering. All materials shall be subject to observation by the Owner's Authorized Representative at any time after confirmation of ordering.
- 3. Submit Photos 20 days before Nursery Observation; provide clear 4 inch x 6 inch color photos of each representative tree. Include the nursery source for all Contractor-furnished materials. For all trees, provide picture (size noted above) that includes a person adjacent to the container size, height, width, and trunk caliper size.
- 4. Submit manufacturers or vendors certified analysis for all fertilizers, and soil amendments.
- 5. Furnish the source of imported soil backfill for approval.
- 6. Submit import soil certified analysis if imported soil is required.
- 7. Submit specifications of any item being used on site upon the request of The Owner's Authorized Representative.

1.05 INSPECTION

- A. Notify the Owner's Authorized Representative at least 48 hours prior to time of the following required inspections:
  - 1. Trees at their nursery/source prior to delivery to the job-site or elsewhere as may otherwise be directed by the Contractor. See section 1.03.C. of this specification for more instructions.
  - 2. Trees at time of delivery to the job site.
  - 3. Trees and construction items prior to start of Tree Mitigation Maintenance.
  - 4. The Owner's Authorized Representative shall have the right to make periodic inspections prior to final inspection. Should trees, installation procedures, or other conditions be observed that are not in accordance with the contract drawings or specifications, the Owner's Authorized Representative shall direct the Contractor to correct by repair and /or replacement as appropriate. All rejected materials shall be immediately removed from the site and replaced with specified materials at no additional cost to the Owner's Authorized Representative.

#### 1.06 EXISTING UTILITIES

- A. Exercise care in excavating and working near existing utilities. Contractor shall be responsible for damages to utilities which are caused by Contractor's operations or neglect. Check existing utility drawings for existing utility locations. Contractor to verify all existing utilities through Dig Alert, at (800) 227-2600 a minimum of 2 days prior to construction.
- B. Repair or replace existing improvements which are not designated for removal which are damaged or removed as a result of Contractor's operations. When a portion of a sprinkler system must be removed, cap the remaining lines. Repairs and replacements shall be equal to existing improvements, and shall match them in finish and dimension.
- C. Protect existing utilities that are not to be removed from damage or injury. If damage or removal occurs because of the Contractor's operations, the utility shall be restored or replaced in, as nearly the original condition and location as is reasonably possible.

#### 1.07 VERIFICATIONS OF DIMENSIONS AND QUANTITIES

- A. Verify scaled dimensions and quantities prior to start of work.
- B. Notify the Owner's Authorized Representative of discrepancies between Drawings and Specifications and actual job site conditions which would affect the execution of tree mitigation. Do not work in areas where discrepancies occur until instructed by the Owner.

#### 1.08 DELIVERY, HANDLING AND STORAGE

- A. Delivery:
  - 1. Deliver fertilizer to site in original unopened containers bearing manufacturer's guaranteed chemical analysis, name, trademark, and compliance with all applicable laws.
  - 2. Deliver at least one tree of each type and variety with legible identification label.
  - 3. State correct tree name and size indicated on tree legend.

4. Use durable waterproof labels with water-resistant ink, which will remain legible for at least 60 calendar days.
5. Protect trees during delivery to prevent damage.
6. The Contractor shall notify the Owner's Authorized Representative four (4) calendar days in advance of delivery of all trees and shall submit an itemized list of the trees in each delivery.

B. Handling:

1. The Contractor shall exercise care in handling, loading and unloading Trees that have been damaged in any way shall be rejected and if installed, shall be replaced at the Contractor's expense.

C. Storage:

1. Maintain and protect trees from weather conditions that could cause damage to the trees (ie: extreme heat, extreme winds, excessive rain etc.) maintaining trees in a healthy, vigorous condition during storage.

1.09 PROJECT CONDITIONS

- A. Perform actual tree planting only when weather and soil conditions are suitable and will not be detrimental to the trees.

1.10 SCHEDULING

- A. Prior to commencement of tree mitigation work, the Contractor shall arrange a conference at the site with the Owner's Authorized Representative. The conference shall include the Contractor, the Superintendent appointed to oversee the work of this Section and the Owner's Authorized Representative. At least eight (8) working days' notice shall be given prior to the conference. The Contractor shall prepare a schedule of work items and this shall be reviewed at the conference.

1.11 GUARANTEE

- A. Guarantee boxed trees, to "live and grow" in an "acceptable, upright position" for a period of one (1) year after completion of the specified maintenance period. Definition of "live and grow" and "acceptable and upright position" shall mean that the tree must, during the guarantee period, sustain a healthy, vigorous appearance. It shall not defoliate more than 30% nor shall 30% of the foliage be dried and unhealthy in appearance. If the tree, during the guarantee period does not sustain this specified appearance, it shall be removed and replaced without cost to the Owner.
- B. The Contractor shall periodically and regularly check work areas during the guarantee period to insure proper maintenance procedures are being implemented.
- C. In case of negligent or improper maintenance, the contractor shall state in writing to the Owner's Authorized Representative his observations and recommendation. Any claims not in writing will not be considered.



**PART 1 - PRODUCTS****2.01 MATERIALS**

- A. All soil amendments, fertilizers and imported soil shall be per agronomic soils report recommendations. All soil amendments and fertilizers listed below are to be used for Bid Purposes only.
- B. All materials shall be of standard approved and first-grade quality and shall be in prime condition when installed and accepted. Any commercially processed or packaged material shall be delivered to the site in the original unopened container bearing the manufacturer's guaranteed analysis. Supply The Owner's Authorized Representative with a sample of all supplied materials within fourteen (14) days after award of contract, accompanied by analytical data from an approved laboratory source or bearing the manufacturer's guaranteed analysis. Amendments may be modified based on agronomic soils report recommendations.
- C. The following soil amendments are for Bid Purposes only:
1. Soil Sulfur: Agricultural grade sulfur containing a minimum of 99% sulfur (expressed as elemental).
  2. Iron Sulfate: 20% Iron (expressed as metallic iron), derived from ferric and ferrous sulfate, 10% sulfur (expressed as elemental).
  3. Calcium Carbonate Lime: 95% lime as derived from oyster shells.
  4. Gypsum: Agricultural grade product containing 98% minimum calcium sulfate.
  5. Dolomite Lime:
    - a. 21% calcium
    - b. 11% magnesium
- D. Commercial Fertilizer:
1. The following fertilizer is for Bid Purposes Only. Granular product having a chemical analysis of 12-12-12 Nitrogen, Phosphoric acid, and Potash, unless otherwise specified on Drawings and recommended approved agronomic report; free-flowing material mixed by supplier, delivered in unopened sacks. Do not use material which becomes caked or otherwise damaged
    - a. Tree Fertilizer: Pelleted or granular form shall consist of the following percents by weight and shall be mixed by commercial fertilizer supplier:  
6% nitrogen  
20% phosphoric acid  
20% potash
    - b. Nitroform: 38-0-0 slow release organic nitrogen.
    - c. Single Super Phosphate, or approved equal: Commercial product containing 18- 20% available Phosphoric Pentoxide

d. DAP (Di-Ammonium Phosphate): 18-46-0

2. Planting Tablets:

a. Shall be slow-released type, (crushed) with potential acidity of not more than 5% by weight containing the following percentages of nutrients by weight:

- 1) 20.0% nitrogen
- 2) 10.0% phosphoric acid
- 3) 5.0% potash
- 4) 2.6% combined calcium
- 5) 1.6% combined sulfur
- 6) .35% iron (elemental) from ferrous sulfate

b. Shall be 21-gram tablets as manufactured by Agriform, or approved equal, applied per manufacturer's instructions.

c. Crush tablets into granular pieces prior to placement in tree pits.  
36" box = 6 tablets

E. "Suitable Borrowed Topsoil or Reclaimed Soil":

1. Topsoil shall be free of roots, clods and stones larger than 1 inch (in the upper 8" of soil), pockets of coarse sand, noxious weeds such as nut grass roots and nodules, sticks, brush and other litter. It shall not be infested with nematodes or other undesirable insects or plant disease organisms and/or pathogens.

2. Topsoil shall be friable and have sufficient structure in order to give good structure and aeration to the soil.

3. Gradation limits: Soil shall be a sandy loam, loam or clay loam. The definition of soil texture shall be per the USDA classification scheme. Gravel over 1/4 inch in diameter shall be less than 20% by weight.

4. Permeability rate: Hydraulic conductivity rate shall be not less than one inch per hour nor more than 20 inches per hour when tested in accordance with the USDA Handbook Number 60, method 34b or other approved methods.

5. Fertility: The range of the essential elemental concentration in soil shall be as follows:

a. Ammonium Bicarbonate/DTPA Extraction parts per million (mg/kilogram)  
dry weight basis

phosphorus	2 - 40
potassium	40 - 220
iron	2 - 35
manganese	0.3 - 6
zinc	0.6 - 8
copper	0.1 - 5

boron	0.2 - 1
magnesium	50 - 150
sodium	0 - 100
sulfur	25 - 500
molybdenum	0.1 - 2

6. Soil may need to be amended and conditioned to optimize plant growth. The above listed fertility is for soil selection.
7. Concentration of nutrients for final acceptance:
  - a. Ammonium Bicarbonate/DTPA Extraction parts per million (mg/kilogram) dry weight basis

phosphorus	10 - 40
potassium	100 - 220
iron	24- 35
manganese	0.6 - 6
zinc	1 - 8
copper	0.3 - 5
boron	0.2 - 1
magnesium	50 - 150
sodium	0 - 100
sulfur	25 - 500
molybdenum	0.1 - 2
8. Acidity: The soil pH range measured in the saturation extract (Method 21a, USDA Handbook Number 60) shall be 6.0 - 7.9.
9. Salinity: The salinity range measured in the saturation extract (Method 3a, USDA Handbook Number 60) shall be 0.5 - 2.5 dS/m.
10. Chloride: The maximum concentration of soluble chloride in the saturation extract (Method 3a, USDA Handbook Number 60) shall be 150 mg/l (parts per million).
11. Boron: The maximum concentration of soluble boron in the saturation extract (Method 3a, USDA Handbook Number 60) shall be 1 mg/l (parts per million).
12. Sodium Adsorption Ratio (SAR): The maximum SAR shall be 3 measured per Method 20b, USDA Handbook Number 60.
13. Aluminum: Available aluminum measured with the Ammonium Bicarbonate/DTPA Extraction shall be less than 3 parts per million.
14. Soil Organic Matter Content: Sufficient soil organic matter shall be present to impart good physical soil properties but not be excessive to cause toxicity or cause excessive reduction in the volume of soil due to decomposition of organic matter. The desirable range is 3% to 7%. The carbon/nitrogen ratio should be

about 10. A high carbon/nitrogen ratio can indicate the presence of hydrocarbons or non-humified organic matter.

15. Calcium Carbonate Content: Free calcium carbonate (limestone) shall not be present for acid-loving plants.
16. Heavy Metals: The maximum permissible elemental concentration in the soil shall not exceed the following concentrations:
  - a. Ammonium Bicarbonate/DTPA Extraction parts per million (mg/kilogram) dry weight basis

arsenic	1
cadmium	1
chromium	10
cobalt	2
lead	30
mercury	1
nickel	5
selenium	3
silver	0.5
vanadium	3
  - b. If the soil pH is between 6 and 7, the maximum permissible elemental concentration shall be reduced 50%. If the soil pH is less than 6.0, the maximum permissible elemental concentration shall be reduced 75%. No more than three metals shall be present at 50% or more of the above values.
17. Phytotoxic constituent, herbicides, hydrocarbons, etc: Germination and growth of monocots and dicots shall not be restricted more than 10% compared to the reference soil. Total petroleum hydrocarbons shall not exceed 50 mg/kg dry soil measured per the modified EPA Method No. 8015. Total aromatic volatile organic hydrocarbons (benzene, toluene, xylene and ethylbenzene) shall not exceed 0.5 mg/kg dry soil measured per EPA Methods No. 8020.

F. Suitable Imported Soil:

1. Topsoil shall be free of roots, clods and stones larger than 1 inch (in the upper 8" of soil), pockets of coarse sand, noxious weeds such as nut grass roots and nodules, sticks, brush and other litter. It shall not be infested with nematodes or other undesirable insects or plant disease organisms and/or pathogens.
2. Topsoil shall be friable and have sufficient structure in order to give good tilth and aeration to the soil.
3. Gradation limits: Soil shall be a sandy loam. The definition of soil texture shall be per the USDA classification scheme. Gravel over ¼ inch in diameter shall be less than 10% by weight.

4. Permeability rate: Hydraulic conductivity rate shall be not less than one inch per hour nor more than 20 inches per hour when tested in accordance with the USDA Handbook Number 60, method 34b or other approved methods.
5. Fertility: The range of the essential elemental concentration in soil shall be as follows:
  - a. Ammonium Bicarbonate/DTPA Extraction parts per million (mg/kilogram) dry weight basis

phosphorus	2 - 40
potassium	40 - 220
iron	2 - 35
manganese	0.3 - 6
zinc	0.6 - 8
copper	0.1 - 5
boron	0.2 - 1
magnesium	50 - 150
sodium	0 - 100
sulfur	25 - 500
molybdenum	0.1 - 2
  - b. Soil may need to be amended and conditioned to optimize plant growth. The above listed fertility is for soil selection.
6. Concentration of nutrients for final acceptance:
  - a. Ammonium Bicarbonate/DTPA Extraction parts per million (mg/kilogram) dry weight basis

phosphorus	10 - 40
potassium	100 - 220
iron	24- 35
manganese	0.6 - 6
zinc	1 - 8
copper	0.3 - 5
boron	0.2 - 1
magnesium	50 - 150
sodium	0 - 100
sulfur	25 - 500
molybdenum	0.1 - 2
7. Acidity: The soil pH range measured in the saturation extract (Method 21a, USDA Handbook Number 60) shall be 6.0 - 7.9.

8. Salinity: The salinity range measured in the saturation extract (Method 3a, USDA Handbook Number 60) shall be 0.5 - 2.5 dS/m.
9. Chloride: The maximum concentration of soluble chloride in the saturation extract (Method 3a, USDA Handbook Number 60) shall be 150 mg/l (parts per million).
10. Boron: The maximum concentration of soluble boron in the saturation extract (Method 3a, USDA Handbook Number 60) shall be 1 mg/l (parts per million).
11. Sodium Adsorption Ratio (SAR): The maximum SAR shall be 3 measured per Method 20b, USDA Handbook Number 60.
12. Aluminum: Available aluminum measured with the Ammonium Bicarbonate/DTPA Extraction shall be less than 3 parts per million.
13. Soil Organic Matter Content: Sufficient soil organic matter shall be present to impart good physical soil properties but not be excessive to cause toxicity or cause excessive reduction in the volume of soil due to decomposition of organic matter. The desirable range is 3% to 7%. The carbon/nitrogen ratio should be about 10. A high carbon/nitrogen ratio can indicate the presence of hydrocarbons or non-humified organic matter.
14. Calcium Carbonate Content: Free calcium carbonate (limestone) shall not be present for acid-loving plants.
15. Heavy Metals: The maximum permissible elemental concentration in the soil shall not exceed the following concentrations:
  - a. Ammonium Bicarbonate/DTPA Extraction parts per million (mg/kilogram) dry weight basis

arsenic	1
cadmium	1
chromium	10
cobalt	2
lead	30
mercury	1
nickel	5
selenium	3
silver	0.5
vanadium	3
  - b. If the soil pH is between 6 and 7, the maximum permissible elemental concentration shall be reduced 50%. If the soil pH is less than 6.0, the maximum permissible elemental concentration shall be reduced 75%. No more than three metals shall be present at 50% or more of the above values.
16. Phytotoxic constituent, herbicides, hydrocarbons, etc: Germination and growth of monocots and dicots shall not be restricted more than 10% compared to the reference soil. Total petroleum hydrocarbons shall not exceed 50 mg/kg dry soil

measured per the modified EPA Method No. 8015. Total aromatic volatile organic hydrocarbons (benzene, toluene, xylene and ethylbenzene) shall not exceed 0.5 mg/kg dry soil measured per EPA Methods No. 8020.

## 2.02 TREE PLANTING

### A. General:

1. Trees shall be in accordance with the California State Department of Agriculture's regulation for nursery inspections, rules and rating. All trees shall have a normal habit of growth and shall be sound, healthy, vigorous and free of insect infestations, plant diseases, excessive abrasions, or other objectionable disfigurements. Where sample trees inspected are found to be defective, The Owner's Authorized Representative reserves the right to reject the entire lot or lots of trees represented by the defective samples. Any tree rendered unsuitable for planting because of this inspection shall be considered as samples and shall be provided at the expense of the Contractor.
2. Sizing of the trees shall correspond with industry standards for species and variety of commercially available nursery stock or as specified on drawings. Trees larger in size than specified may be used with the approval of The Owner's Authorized Representative, but the use of larger trees shall not change the contract price.
3. All trees not in compliance with the requirements herein specified, will be considered defective and such trees, whether in place or not, shall be marked as rejected and immediately removed from the site of the work and replaced with new trees at the Contractor's expense. The trees shall be of the species, variety, size, and conditions specified herein or as shown on the drawings. Under no conditions shall there be any substitutions of trees or sizes listed on the accompanying plans, except with the express consent of the Owner's Authorized Representative.
4. Trees shall be true to botanical and common name and variety as specified in "Sunset Western Garden Book" (2007 edition).

### B. Nursery Grown and Collected Stock.

1. Trees shall be grown under climatic conditions similar to those in the locality of the project.

### C. All Trees will be accounted for at final walk, Contractor shall be responsible for total trees as noted on Drawings.

### D. Trees shall conform to type and size noted on Drawings.

1. Measure tree height from the root crown to the last division of the terminal leader and measure the diameter 6 inches above the root crown.
2. Trees shall stand erect without support.

## 2.03 GENERAL MATERIALS

### A. Tree Stakes: As designated on Drawings or specified in this section.

1. Wood tree stakes, 2 inches in diameter by 10 feet long, lodge pole grade, treated with coppernaphthanate wood preservative in strict accordance with Federal Spec.TT-W-572 Type 1 Composition B, capable of standing in the ground at least 2 years, no split stakes.
- B. Guy and Tie Wire: Provide guy wire which is spring loaded within rubber hose material as manufactured by Wonder Tree Tie, Hayward, CA (415/785-0735) or equal (no known equal).
- C. Tree Ties:
  1. VIT Twist Brace Tree Supports or approved equal, Two (2) ties per tree, ties to be TB24 Twist Brace for 15 gal.- 24 inch box.
- D. Root Barrier:
  1. Install root barrier required for all trees within 5'-0" of any curbs, or other hardscape materials, per manufacture's recommendations. NDS RP Series Root Barrier Panels RP-2450 Black 50EP or approved equal. Available from: NDS-800-726-1994

**PART 3 – EXECUTION**

**3.01 EXAMINATION**

- A. Inspect tree for injury, insect infestation and for improper pruning.
- B. Do not begin planting of trees until deficiencies are corrected or tree replaced.
- C. Site Visits:
  1. Site visits for review and inspection of work shall be scheduled with the Owner's Authorized Representative, and shall include, but not be limited to the following items:
    - a. Review of trees placement for location prior to planting.
    - b. Review at completion of planting.
    - c. Review at the completion of the maintenance period.
    - d. Review at the completion of the warranty period.

**3.02 PREPARATION FOR TREE PITS**

- A. Soil Preparation: See Agronomic Soils Report
- B. Final Grading: See Civil Engineers Drawings.

**3.03 TREE PLANTING**

- A. General:



1. Actual tree planting shall be performed during those periods when weather and soil conditions are suitable and in accordance with locally accepted practice as approved by the Owner's Authorized Representative.
  2. Boxes shall be opened and trees shall be removed in such a manner that the ball of earth surrounding the roots is not broken and they shall be planted and watered as herein specified immediately after removal from the containers. Boxes shall not be opened prior to placing the trees in the tree pit.
- B. Lay-Out of Trees: Locations for Trees shall be spotted before any tree planting or excavation begins. All such locations shall be approved by the Owner's Authorized Representative. Layout shall be accomplished by setting boxed trees or grade stakes with plants identified in locations indicated on plans. See Section 1.06.A. before excavation begins. If underground construction or utility lines are encountered in the excavation of tree pits other locations for planting trees will be selected as approved by the Owner's Authorized Representative.
- C. Tree Subsurface Drainage System: See Civil Engineers Plans
- D. Tree Planting:
1. Make Tree pits approximately square with vertical sides twice the width of the box container or root ball and larger if necessary to permit handling and tree without injury to the root system.
  2. Do not plant trees with a broken or cracked root ball before or during planting.
  3. Open and remove tree boxes so that the tree roots is not injured.
  4. Remove tree boxes after tree is positioned in the tree pit.
  5. Backfill the bottom portion of the pit with the approved specified backfill mix minus the fertilizers and water settle.
  6. After "water settling" the bottom portion of the pit, set the tree approximately in the center of the pit and adjust the root crown. 1 inch above finish grade.
  7. Backfill balance of the pit with the specified backfill mix and fertilizer and "water settle".
  8. Crush fertilizer tablets place them 3/4 up the tree pit.
  9. Form a watering basin for trees per construction document detail.
  10. Restore the area around the tree to finish grade and dispose of excess soil.
  11. After planting trees, trees shall be plumb with the root crown at its natural depth with respect to finish grade.
  12. Clean and prune trees. Only prune or remove broken or damaged limbs.
- E. Fertilizing: See agronomic soil report.

### 3.04 TREE STAKING

- A. Contractor is responsible for material remaining plumb and straight for all given conditions during the guarantee period.
- B. Use two stakes per tree as indicated on the Drawings. Locate stakes so that tree is supported against prevailing winds and as close to the main trunk as is practical while avoiding root injury. Stakes shall be driven into ground at least 24 inches below grade.
- C. Find proper height for point of tree ties and attach tree ties to trunk at first major branching point or as needed to stabilize and protect tree from damage. Cut off any remaining stake after total securement to within 2 inches of upper tree tie.
- D. Tighten tree ties as needed to keep trees straight and up right.

3.05 TREE GUYING

- A. Guying and Anchoring: Guy and stake trees exceeding 14 feet in height and more than 3 inches in caliper, unless otherwise indicated. Securely attach no fewer than 3 guys to stakes 30 inches long, driven to grade.
  - 1. For trees more than 6 inches in caliper, anchor guys to pressure-preservative-treated deadmen 8 inches in diameter and 48 inches long buried at least 36 inches below grade. Provide turnbuckles for each guy wire and tighten securely.
  - 2. Attach flags to each guy wire, 30 inches above finish grade.

3.06 ROOT BARRIERS:

- A. Install linear root barriers along all pavements including: sidewalks, curbs, wall or similar hardscape areas within 5' from all planted trees. Root barriers shall extend 5' on either side of the trunk. Install per manufacturer's specifications.

3.07 WATERING

- A. Keep tree areas moist during the tree planting and establishment period. Provide whatever system is necessary to provide adequate water during the tree planting and establishment period without causing erosion detrimental to the tree.
- B. Water trees immediately after planting.

3.08 CLEANUP

- A. Leave the site area broom-clean daily leaving the premises in a clean condition. All walks shall be left in a clean and safe condition.
- B. After all tree operations have been completed; remove all trash, excess soil, empty tree boxes/containers and rubbish from the property. All scars, ruts or other marks in the ground caused by this work shall be repaired and the ground left in a neat and orderly condition throughout the site. Pick up all trash resulting from this work no less frequently than each Friday before leaving the site or the last working day of each week. All trash shall be removed completely from the site.

**END OF SECTION**

**SECTION 02940 - PALM PLANTING****PART I - GENERAL****1.01 DESCRIPTION**

- A. Work Included: Contractor shall furnish all labor, materials, appliances, facilities, transportation, and services necessary for and incidental to performing operations of the work in this section, complete, as shown on the drawings or specified herein. Contractor's bid shall include all materials and services referenced in the Drawings and these Specifications, and shall be responsible for review and completion all these specification instructions herein. Work includes, but is not limited to the following:
1. Finish grading of planting areas.
  2. Palm tree inspection.
  3. Soil mixes and fertilizers per agronomic soil test recommendations.
  4. Palm Planting.
  5. Backfilling.
  6. Fertilization.
  7. Maintenance.
- B. Related Work in other sections:
1. Tree Planting – Section 02910.
  2. Tree and Palm Maintenance - Section 02975.
- C. Any Palm deemed 'Not Available' shall be noted in the bid. Failure to qualify availability of specified material shall make the Contractor responsible for supplying all material. Tree Maintenance period may not begin until all specified materials are installed.

**1.02 QUALITY ASSURANCE AND REQUIREMENTS**

- A. Standards:
1. Provide Palms and palm planting materials meeting or exceeding specifications of Federal, State, County and Municipal laws requiring inspection for plant disease and insect control.
  2. Workmanship: Perform work in accordance with the best standards of practice for landscape work and under the continual supervision of a competent foreman capable of interpreting the drawings and specifications.
  3. Qualifications: Contractor to provide written documentation of at least three (3) years successful experience of Palm Tree planting for projects of similar size or larger.

4. Verification of Dimensions and Quantities: Scaled dimensions are approximate. Before proceeding with any work, carefully check and verify the dimensions and quantities and immediately inform the Owner's Authorized Representative of any discrepancy between the drawings and/or specifications and actual conditions. No work shall be done in any area where there is any such discrepancy and until approval has been given by the Owner's Authorized Representative.

B. Submittals:

1. Prior to installation, the Contractor shall submit to the Owner's Authorized Representative two copies of manufacturers literature, receipts of sale and laboratory analytical data for the following items:
  - a. Organic amendments
  - b. Topsoil
  - c. Commercial Fertilizer
  - d. Palms
2. The Contractor shall submit specifications of any item being used on site upon the request of the Owner's Authorized Representative.

C. Certification: Provide a certificate with each delivery of bulk material, stating the source, quantity and type of material and stating that the material conforms to the specified requirements.

1. For bulk delivered organic fertilizer, the certificate must show the volume, net weight and percentages of nitrogen, phosphorus and potassium.
2. For other fertilizers and soil conditions in containers, show on the certificate the total quantities by weight and volume for each material. The Owner's Authorized Representative reserves the right to take and analyze samples of materials for conformity to specifications. Furnish samples upon request of the Owner's Authorized Representative.

D. Sub-drainage Materials: Per Civil Engineers Plans

1.03 PROJECT/SITE CONDITIONS

A. Subsurface Improvements:

1. Protect existing underground and surface utility structures.
2. Repair and Restore damaged improvements to original condition.

1.04 SEQUENCING AND SCHEDULING

A. Ordering of Palms:

1. Documentation: Submit documentation per Section 2910.1.04.
2. Distant Material: Submit photographs with a person adjacent to each palm and a telescoping measuring rod for preliminary review (Jameson rod or equal).

Measuring rod is to be placed consistently close to the Palm base. Such review shall not impair the right of review and rejection during progress of the work.

- B. Materials and Observation per Section 2910.1.03.B.1 and C.1.
  - 1. Owner's Authorized Representative may also choose to observe the following:
    - a. Observe on-site equipment to be used in the removal, backfill, and placement of palm trees.
    - b. Observe and approve of palm tree locations prior to digging pits.
    - c. Observe defroning, skinning, and tying prior to delivery of trees.
    - d. Observe palm planting operations at project site.
    - e. Observe for final acceptance and release from maintenance following completion of the maintenance period.
- C. Coordination: Coordinate delivery and installation of palms with work in other sections to insure the following:
  - 1. Subsurface Drainage Systems: See Civil Engineer Plans
  - 2. Paving: Where palms are installed in paved areas, coordinate with Paving Contractor for installataion.
  - 3. Irrigation: Coordinate installation of palms in planting areas with Irrigation Contractor for irrigation installation so as not to delay the irrigation work.

#### 1.05 GUARANTEE

- A. Guarantee that all palms planted under this contract will be healthy and in a flourishing condition of active growth one (1) years from date of Final Acceptance. Contractor shall guarantee palms against the root rot disease "Phytophthora" and similar vascular infections during Warranty Period. Retain Labor and Materials bonds as a warranty.
- B. Delays: Delay in completion of palm planting operations which extend the palm planting will extend the Warranty Period correspondingly.
- C. Conditions of Plants: All varieties of Palms shall be free of dead or dying fronds with all fronds of a normal size and color. Scarring will not be permitted on palm trunks; after tagging, Washingtonia palm trunks shall be skinned. See Section 2.01. of this specification for information on limitations and acceptable condition of palms.
- D. Replacements: Replace without additional cost to owner, all dead palms and all palms not in a vigorous, thriving condition or in unsatisfactory growth condition as determined by Owner's Authorized Representative during and at the end of Warranty Period. Immediately remove from site and replace with new palm trees. Ensure that replacement palm trees are of the same size as the adjacent palms at time of replacement, with species and condition as originally specified. Apply all requirements of this specification to all replacements.
- E. Repair: Contractor shall be responsible for repair of adjacent site improvements damaged by palm planting work. Restore all to their original condition, as acceptable to the Owner's Authorized Representative.

- F. Exclusions: Contractor shall not be held responsible for failures due to neglect by owner, vandalism, or Acts of God, during warranty period. Report such conditions in writing.

**PART 2 - PRODUCTS**

2.01 PLANT MATERIALS

A. General

- 1. Growing Conditions: Palms shall conform to type and size noted on drawings.
  - a. Palms shall be orchard grown in accordance with plans and good horticultural practices.

B. Selection of Palm Trees

- 1. Appearance: All Palms types shall be well-grown, symmetrical, without curvature or leaning of the trunk from the perpendicular (unless specified), and so trained or favored in development and appearance as to be superior in form, compactness, and symmetry of crown. Palms shall be free of air roots and clean to the bottom of the trunk. Palms shall be without rat holes, drought rings and penciling or hour glassing. BTH (Brown Trunk Height) shall be measured from the bottom of the crown bud (Meristem) to finish grade after installation. Palms to be placed adjacent to each other shall have trunk diameters sized within 6 inches of each other
- 2. Vigor: All Palm types shall be sound, healthy, and vigorous, well foliated prior to defronging and showing no sign of previous disease or stress. They shall be free of disease, insect pests, eggs, or larvae. Palms shall be free from physical damage, or Black fungus or any adverse conditions which would prevent thriving growth. They shall have healthy, well-developed root systems.
- 3. Field Dug Palm Stock: Verify that field dug palms have an adequate root ball to guarantee successful transplantation.

2.02 GENERAL MATERIALS

A. Palm Fertilizer: Per Agronomic Soils Report.

B. Fertilizer stated herein is for Bid purposes only: Fertilization application rate to be determined by soils report.

- 1. Product:  
"Best Apex" Palm Plus 19-6-13 NPK  
Manufacturer: J.R. Simplot Company or approved equal  
800 992-6066  
[www.bestfertilizer.com](http://www.bestfertilizer.com)

C. Sand: Back fill with washed "clean sand". Medium sized sand, Number 16  
Percent Passing

4 mesh	100
10 mesh	98-100
16 mesh	68-82
32 mesh	0-20
60 mesh	0-1

### 2.03 FUNGICIDES

- A. Soil Drench: "Subdue" by Ciba-Giegy Co., (919) 292-7100 or approved equal.

## **PART 3 - EXECUTION**

### 3.01 PALM TREE INSPECTION

- A. Coordinate with Owner's Authorized Representative to locate palm trees within the same palm groves or palms located per contract agreement so that variation in brown trunk height and overall appearance of Palm trees are similar.
- B. In a set/group of palms BTH maximum variation allowed will be 12 inches.

### 3.02 LABELING AND HANDLING PALM

- A. Labeling: For all Field-Dug palms, attach label to palm for delivery sequencing. All palms shall be tagged with a number.
1. Store palms with protection from weather or other conditions which can damage and/or impair their vigor. Protect palms from the sun during summer months with temperatures above 80 degrees Fahrenheit. Protection of the palms during transport and storage shall be the Contractors responsibility.
- B. Handling the Field Dug palm root ball at original source, field or grove:
1. When digging root ball extend excavation width and depth below the major root system.
  2. When balling out field grown palms, no cutting shall be done closer than 24 inches to the trunk of the Washingtonia robusta palm at ground level and the excavation shall extend to a depth below the major root system. The bottom of the ball shall be cut off square and perpendicular to the trunk of the palm. Under no circumstances shall the Contractor cut the size of the ball in width or depth less unless approved by the Owner's Authorized Representative.
  3. At no time during the process of removal at the original source or transport and placement at site should the palms be allowed to be balled out or laid on ground with root ball left exposed to direct sunlight. Roots must remain moist and reasonably cool at all times. Wrap burlap around root balls during handling and delivery, keep burlap moist. Do not wrap root ball with plastic if delivering to project site during summer months, Plastic may be used during other seasons provided the palm is not stored for any length of time in plastic and the roots are protected from excessive heat conditions. Upon arrival to site, cut plastic at

bottom of root ball to allow roots to air. Do not install field-dug palms that have dry and cracked or broken root balls of earth when unpacked from their wrapping.

- C. Handling all Palm Trunk and Crowns during Removal, Delivery and Transplanting:
  - 1. At no time shall the Contractor put strain on the crown of the palm during the process of transplanting. The trunk of the palms shall be protected while lifting and relocating so as not to scar or skin the trunk of the palm. Use a protective device around trunk of palm tree while lifting and relocating. Device shall consist of either a rubber or leather sling made with timbers sufficiently sized to withstand choker pressure.

### 3.03 PRUNING, DE-FRONGING AND TYING

- A. In preparing palm trees for relocation, remove dead fronds. Take care not to injure palm.
  - 1. Washingtonia palm trunks shall have dead fronds skinned approximately to the top  $\frac{1}{4}$  of the trunk. The grove foreman has the discretion of making the boot length longer, only removing to a height that is healthy for the palm to survive. Take care to prevent injury to the trunk. If more than one palm is planted and palms are laid out in rows or in close proximity to each other, the boot length shall match. Green fronds shall be lifted up and tied together around the crown of the palm in an upright position. Caution shall be taken not to bind or injure the crown. Use a light weight natural jute binder twine in tying up the fronds; wire or nylon will not be permitted. The defroning and tying up of the fronds shall be done prior to relocation of the palms and to the satisfaction of the Owner's Authorized Representative.
- B. Delivery: Arrange delivery time so a minimum amount of time elapses between delivery to site and installation.

### 3.04 INSTALLATION

- A. Finish Grades: See Civil Engineers Plans
- B. Layout and Staking: Layout palms at locations shown on drawings. Owner's Authorized Representative will check location of palms in the field and adjust to exact position before planting begins. Owner's Authorized Representative reserves the right to refuse review at this time, if, in his opinion, an insufficient quantity of palms is available or if work is not complete to a point where palms tree installation may commence properly.
- C. Palm Subsurface Drainage System: See Civil Engineers Plans
- D. Pre-planting: Where palms are to be pre-planted to permit the continuation of site improvements to be installed around them, Contractor shall be responsible for the accurate layout of those palms. Contractor shall be responsible for the protection of those palms while other work is taking place. Provide regular irrigation as necessary prior to installation and functioning of irrigation systems specified in another section.
- E. Palm Pit Excavation
  - 1. Saturate planting holes by flooding prior to planting.



2. The diameter of the planting hole shall be 18 inches larger than the root ball unless otherwise recommended by the palm tree supplier. Dust the bottom and sides of the planting hole with gypsum prior to planting.

### 3.05 PLANTING

#### A. Palm Planting and Backfill Mix:

1. Do not plant during rain or windy conditions.
2. Set the root ball on backfill in the planting hole per contract document details. The root crown shall be buried as deep as required to stabilize the palm in an upright position.
3. Backfill palm pit with sand per soil report recommendations. Continuously adjust palm to insure a plumb and rigidly based trunk. Palms shall stand erect without support after planting. Solidly compact sand around the upper ball and all portions of the buried trunk while backfilling. When planting pit has been backfilled approximately 2/3 full, water thoroughly to saturate before installing remainder of backfill.
4. Form a basin with a berm centered around palm pits per contract document details.
5. Fertilizer: See Agronomic Soils report.
6. Root Growth Stimulant: Apply two treatments (one immediately after planting and one 10 days following) a root growth stimulant of vitamin B-1, shall be applied to each palm tree.
7. Wetting Agent: Apply Aqua Gro "L" per manufacturer recommendation.
8. After installation, all palm heights shall be approximately the same height from finish grade to crown (Meristem).
9. Protect planting areas from excessive vehicle compaction when craning palms to their planting pits.

#### B. Irrigation System

1. Closely monitor water intake to palms to insure adequate water is being provided to the palms at all times.
2. It is critical that palm trees receive a plentiful supply of water during the palm tree establishment period. Contractor shall be responsible for watering practices adequate to guarantee palm establishment by whatever means necessary.
3. Minimize excess irrigation. Adjust irrigation controller schedule to provide the ideal amount of water to the palms.

#### C. Before and During Palm Maintenance Period

1. Frond Fungicide Application: On all palms showing signs of transplant distress, treat palm with an approved fungicide per manufacturer's recommendation.

2. Soil Fungicide Application: Treat the soil with an approved fungicide; "Subdue" or equal and apply per manufacturers recommendation. Reapply at three-week intervals through the maintenance period.

3.06 CLEAN-UP

- A. Following palm tree installation remove equipment and implements of service used in work, debris, refuse and leave work area in a neat and clean condition acceptable to Owner's Authorized Representative and construction manager.

**END OF SECTION**

**SECTION 02975 – TREE AND PALM MAINTENANCE****PART 1 - GENERAL****1.01 DESCRIPTION**

- A. Work included: Furnish all labor, material, equipment and services required to maintain the landscape in an attractive condition as specified herein for a period of 90 calendar days. The maintenance period will begin after completion of all work and punchlist items and shall be determined in writing by the Owner's Authorized Representative. Contractor's bid shall include all materials and services referenced in the Drawings and these Specifications, and shall be responsible for review and completion of the specification instructions herein.
- B. RELATED WORK:
1. Tree Planting - Section 02910
  2. Palm Planting - Section 02940

**1.02 QUALITY ASSURANCE****A. Work Force**

1. Experience: The landscape maintenance firm shall have a full time foreman assigned to the job for the duration of the contract. That person shall have a minimum of fifteen (15) years' experience in in public works projects and maintenance supervision, with experience or training in tree maintenance, entomology, pest control, soils, fertilizers, and plant identification and should be versed to communicate to the Owners Authorized Representative in the English language.
2. Labor Force: The landscape maintenance firm's labor force shall be thoroughly familiar and trained in the work to be accomplished and perform the task in a competent, efficient manner acceptable to the Owner.
3. Supervision: The foreman shall directly employ and supervise the work force at all times. Notify The Owner of all changes in supervision and shall:
  - a) Demonstrate experience as a grower/supplier and licensed (C27) installer of specimen trees, 10 years experience minimum
  - b) Provide references and contacts for 3 similar projects, which include a minimum of 25 specimen Palms, in the last 3 years
  - c) Substantiate bid with documented work plan and schedule for obtaining specimen trees, per specification
  - d) Discuss your history and methodology for installing specimen palm trees and standard trees.
4. Identification: Provide proper identification at all times for landscape maintenance firm's labor force. Be uniformly dressed in a manner satisfactory to the Owner.
5. The Owner shall have the right to make periodic inspections prior to final inspection. Should plant materials, installation procedures, or other conditions be observed that are not in accordance with the contract drawings or specifications, the Owner shall direct the Contractor to correct by repair and /or replacement as

appropriate. The Owner shall be the sole judge of the conditions of quality and acceptability and will direct all corrections by the Contractor. All rejected materials shall be immediately removed from the site and replaced with specified materials at no additional cost to the Owner.

### 1.03 SUBMITTALS

- A. Submittals for review during construction phase:
  - 1. Catalog cuts of all herbicides and fertilizers.
  - 2. Prior to the start of the Maintenance Period, submit a schedule of all activities planned during the maintenance period. This shall be accepted by the Owner prior to the start of the maintenance period. All schedule changes shall be documented and accepted by the Owner.
  - 3. All turnover items noted in other specification sections shall be delivered prior to the final walk-through.
  - 4. Supply a monthly record of all herbicides, insecticides, fertilizers, and disease control chemicals with rates and amounts used noted.
  - 5. Soils Report may adjust fertilizer rates and frequencies as noted herein.

## **PART 2 - PRODUCTS**

### 2.01 MATERIALS

- A. All materials used shall either comply with the Tree or Palm Planting Specifications or shall otherwise be acceptable to the Owner.
- B. Maintenance Fertilizer: Refer to the agronomic soils report for fertilizing requirements during the maintenance period.

## **PART 3 – EXECUTION**

### 3.01 APPLICATION

- A. Tree, and Palm Care:
  - 1. Watering: Maintain the water basin around plants so that enough water can be applied to establish moisture through the major root zone. When hand-watering, use a water wand to break the water force.
  - 2. Guying/Staking: Remove guys/stakes as soon as they are no longer needed. Guys/stakes are to be inspected to prevent girdling of trunks or branches and to prevent rubbing that causes bark wounds. Replace all broken guys, stakes and ties with specified materials.
  - 3. Weed Control: Keep basins and areas between plants free of weeds. Use recommended legally approved herbicides. Avoid frequent soil cultivation that destroys shallow roots. Use mulches to help prevent weed seed germination. All shrub and tree beds shall be kept weed-free.

4. Insect and Disease Control: Maintain reasonable control with approved materials.
5. Tighten all tree ties and guying as needed to keep trees growing in a straight upright position.

B. Fertilization:

1. Fertilize all trees/palms per recommendations listed in the agronomic soils report for plant maintenance.
2. After application, irrigate thoroughly.
3. Avoid applying fertilizer to the root ball and base of main stem: rather, spread evenly under plant to drip line.

C. Replacement of Trees/Palms:

1. Replace dead, dying and missing trees and palms within one (1) week of Owners Authorized Representative's request for removal with plants of a size, condition and variety acceptable to the Owner at Contractor's expense.

3.01 CLEAN-UP

- A. The Contractor shall be responsible for the maintenance and health of all trees and palms during the Maintenance Period. All stakes to be removed per the direction of the Owners Authorized Representative's direction and shall be healthy and vigorous.

END OF SECTION

**SECTION 02980 – TREE MITIGATION MONITORING PROGRAM**

**PART 1 GENERAL**

1.01 SCOPE OF WORK:

- A. Monitoring of the trees identified on the plan for a period of 5 calendar years. Commence monitoring program upon completion of required Landscape Maintenance period as specified in section 02975. Work specified in this Section includes furnishing all labor, material, equipment, and services required to monitor tree conditions as specified herein.

1.02 DEFINITION:

- A. The word "District Regulations" as used herein shall refer to The Dana Point Harbor Revitalization Plan and District Regulations certified by the California Coastal Commission on October 6, 2011.

1.03 QUALITY ASSURANCE

A. Arborist Experience:

- 1. The Arborist shall have 5 years' experience as a licensed arborist and shall provide the Owner's Representative with a resume with a minimum of three (3) similar projects, along with references for projects, requiring mitigation monitoring of at least 100 trees over the 5-year period. Demonstrate experience in landscape supervision, including knowledge and training in tree maintenance, entomology, pest control, diseases, soils, fertilizers, and plant identification.

1.04 5-YEAR MONITORING

- A. Monitor all trees as defined by the District Regulations and prepare a Tree Mitigation Monitoring Report. The monitoring period shall not start until all elements of construction, planting, and irrigation for the entire project are in accordance with Plans and Specifications.
- B. Request a Pre-Monitoring inspection with the Owners Authorized Representative at the completion of the Contractor's 90-Day Maintenance Period process.
- C. Upon approval by the Owner's Authorized Representative, a field notification will be issued to the Arborist to establish the effective beginning date of the Monitoring Program.
- D. Monitor the trees for a period of five (5) years and prepare a monitoring report at the end of each year.
- E. In order to carry out the monitoring work, the Contractor shall furnish sufficient qualified personnel and adequate equipment to perform the work.

1.05 SUBMITTALS

- A. Annual monitoring reports and base maps by the arborist for all trees and any supporting documents including tree photos, tree maintenance recommendations, and soils reports shall be submitted for the review and approval of the Director, OC Dana Point Harbor, and the City of Dana Point and shall be on file as a public record.

## 1.06 FREQUENCY OF MONITORING VISITS

- A. The Arborist shall perform annual monitoring visits as needed and shall prepare an annual Tree Mitigation Monitoring Report using the Field Evaluation Form (See Attachments A), the report shall include data, photos and recommendations regarding the health and vigor of each tree. The visits shall be coordinated with the Owner's Authorized Representative at least 48 hours in advance of anticipated visits. Minimum observation visits are as follows:
1. Immediately prior to the commencement of the work in this section.
  2. Annually, in order to prepare monitoring reports.
  3. Prior to the end of the 5-year period in order to prepare the Final Report.

## PART 2 EXECUTION

### 2.01 TREE MONITORING AND REPORTING:

- A. **Tree Monitoring:** The arborist shall evaluate and provide written documentation of the health and care of each tree in their Tree Mitigation Monitoring Report including the following the tree information:
1. Tree Characteristics
  2. Tree Health
  3. Recommended Treatment
- B. **Mapping Trees:** The arborist shall tag and mark all trees within the survey area with a numbered aluminum tree tag. Trees with a trunk calipers 6" or larger: aluminum tag shall be nailed at the north side base of each tree. Trees with a trunk caliper 5 1/2" or smaller: aluminum tag shall be secured with a crimped aluminum wire to the first north side branch of each tree, wire shall be loose enough not to cause girdling. All trees shall have GPS coordinates logged/recorded and included in the report. (Confirm numbering sequence with Owner's Authorized Representative prior to tagging). GPS information will need to be recorded on an AutoCAD base map, provided by OC Dana Point Harbor. The arborist shall include a revised base map indicating all tree numbers and GPS coordinates with each annual report.
- C. **Agronomic Soils Testing:** During tree monitoring, the arborist may determine if soils testing and report is needed. Before a soils test is conducted the arborist shall make a written request to the Owner; the soils report shall be paid for by the Owner upon an approval of the request. The arborist shall supervise all soils testing required to determine soil fertility and review recommended soils remediation necessary to sustain the health and vigor of each tree.
- D. **Watering:** Monitor the watering of each tree to ensure that sufficient irrigation water penetrates throughout root zone and is distributed as frequently as necessary to maintain healthy growth and vigor.
1. The Arborist shall be responsible for familiarizing himself with the particular water requirements for the variety of tree/palm plantings to ensure optimum soil moisture.

- E. Insect and Disease Control: Monitor all trees/palms for insect infestations and diseases. The Arborist in consultation with a licensed Pest Control Operator shall recommend appropriate remedial application of insecticide or chemical applications.
- F. Fertilizing: Make recommendations for an appropriate fertilizing program based on the requirement of each tree/palm species.
- G. Replacement of trees: Monitor the health of trees and recommend replacement of dead or dying tree/palms as necessary.

2.02 FINAL REPORT

- A. Following the conclusion of the 5-year monitoring period, Arborist shall perform a final tree review. The report shall include a final evaluation and recommendations for each tree and any supporting documents including tree photos, tree maintenance recommendations, and available soils reports. The Final Tree Mitigation Monitoring Report shall be submitted for review and approval by the Director, OC Dana Point Harbor, and the City of Dana Point and shall be on file as a public record.

**END OF SECTION 02980**



# DANA POINT HARBOR REVITALIZATION COMMERCIAL CORE PROJECT

COUNTY OF ORANGE  
DANA POINT HARBOR DRIVE  
DANA POINT, CALIFORNIA



**Lynn Capuya, Inc.**  
LANDSCAPE ARCHITECTS

17992 MITCHELL SOUTH IRVINE, CA 92626  
PHONE: (949) 756-0150 FAX: (949) 756-1655  
WWW.LCAPUYA.COM LICENSE #2314

DATE: December 20, 2013  
REVISED MARCH 27, 2014

PROJECT #:

SCALE: 1" = 50'

0

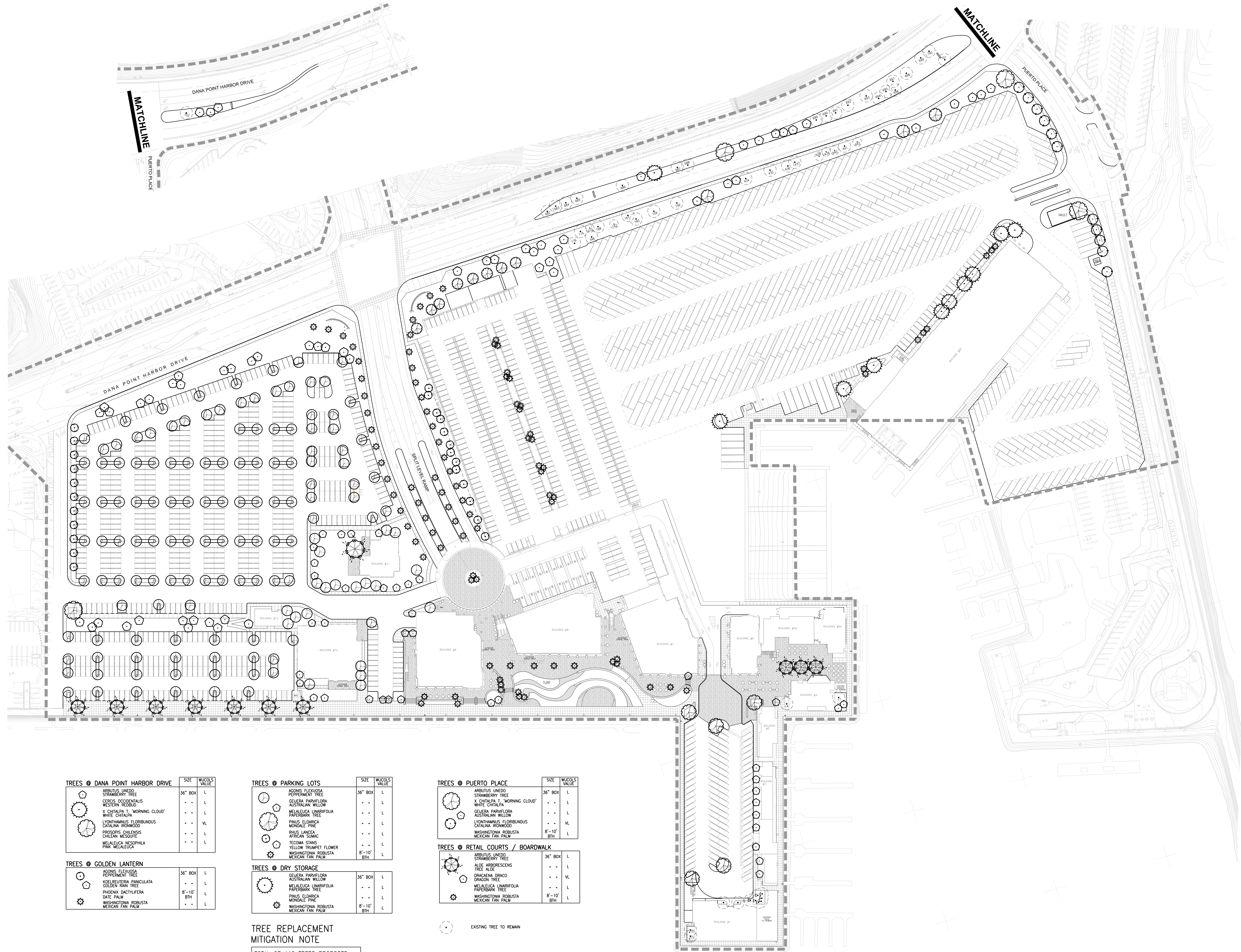
NORTH  
SHEET #:

**CERTIFICATION**  
Irrigation System: LCI certifies that all irrigation system controllers shall with the current adopted California Green Code and shall comply with the County and City's Landscape Water Efficiency ordinance requirements per State of California Assembly Bill 1881 (AB 1881).

Landscape Plans: LCI certifies that all listed plants are in compliance with the Dana Point Harbor District Regulators, Chapter 4, Section N, and shall be installed in accordance with Dana Point Harbor Revitalization Plan Master Plan.

*Lynn Capuya* 9/24/2013  
Date

## TREE REPLACEMENT MITIGATION PLAN



**TREES • DANA POINT HARBOR DRIVE**

TREE SYMBOL	SIZE	MUCOLS VALUE
ARBUTUS UNEDO	36" BOX	L
STRAWBERRY TREE	- -	L
CERCIS OCCIDENTALIS	- -	L
WESTERN REDBUD	- -	L
X CHITALPA T. 'MORNING CLOUD'	- -	L
WHITE CHITALPA	- -	VL
LYONTHAMNUS FLORIBUNDUS	- -	L
CATALINA IRONWOOD	- -	L
PROSOPIS JULIFLORIS	- -	L
CHILEAN MESQUITE	- -	L
MELALEUCA NESOPHILA	- -	L
PINK MELALEUCA	- -	L

**TREES • GOLDEN LANTERN**

TREE SYMBOL	SIZE	MUCOLS VALUE
ACONIS FLEXUOSA	36" BOX	L
PEPPERMINT TREE	- -	L
KOELBUTERIA PANICULATA	- -	L
GOLDEN RAIN TREE	8'-10" BTH	L
PHOENIX DACTYLIPEA	- -	L
DATE PALM	- -	L
WASHINGTONIA ROBUSTA	- -	L
MEXICAN FAN PALM	- -	L

**TREES • PARKING LOTS**

TREE SYMBOL	SIZE	MUCOLS VALUE
ACONIS FLEXUOSA	36" BOX	L
PEPPERMINT TREE	- -	L
CERCIS OCCIDENTALIS	- -	L
AUSTRALIAN WILLOW	- -	L
MELALEUCA LINARIIFOLIA	- -	L
PAPERBARK TREE	- -	L
PHINUS ELIARICA	- -	L
MONDALE PINE	- -	L
PHINUS LANCEA	- -	L
AFRICAN SUMAC	- -	L
TECOMA STANS	- -	L
YELLOW TRUMPET FLOWER	- -	L
WASHINGTONIA ROBUSTA	8'-10" BTH	L
MEXICAN FAN PALM	- -	L

**TREES • DRY STORAGE**

TREE SYMBOL	SIZE	MUCOLS VALUE
CERCIS OCCIDENTALIS	36" BOX	L
AUSTRALIAN WILLOW	- -	L
MELALEUCA LINARIIFOLIA	- -	L
PAPERBARK TREE	- -	L
PHINUS ELIARICA	- -	L
MONDALE PINE	- -	L
WASHINGTONIA ROBUSTA	8'-10" BTH	L
MEXICAN FAN PALM	- -	L

**TREES • PUERTO PLACE**

TREE SYMBOL	SIZE	MUCOLS VALUE
ARBUTUS UNEDO	36" BOX	L
STRAWBERRY TREE	- -	L
X CHITALPA T. 'MORNING CLOUD'	- -	L
WHITE CHITALPA	- -	L
CERCIS OCCIDENTALIS	- -	L
CELESTRA PARVIFLORA	- -	VL
AUSTRALIAN WILLOW	- -	VL
LYONTHAMNUS FLORIBUNDUS	- -	L
CATALINA IRONWOOD	- -	L
WASHINGTONIA ROBUSTA	8'-10" BTH	L
MEXICAN FAN PALM	- -	L

**TREES • RETAIL COURTS / BOARDWALK**

TREE SYMBOL	SIZE	MUCOLS VALUE
ARBUTUS UNEDO	36" BOX	L
STRAWBERRY TREE	- -	L
ALOE ARBORESCENS	- -	L
TREE ALICE	- -	L
DRACAENA DRACO	- -	VL
DRAGON TREE	- -	L
MELALEUCA LINARIIFOLIA	- -	L
PAPERBARK TREE	- -	L
WASHINGTONIA ROBUSTA	8'-10" BTH	L
MEXICAN FAN PALM	- -	L

EXISTING TREE TO REMAIN

**TREE REPLACEMENT  
MITIGATION NOTE**

TOTAL OF 416 TREES PROPOSED.  
BOXED TREES SHALL BE SIZE 36"  
BOX OR LARGER AND ALL PALMS  
SHALL BE 8'-10" BTH OR LARGER.

