





GENERAL CONDITIONS

- A. CONTRACT DOCUMENTS: Shall consist of specifications and its general conditions and the drawings...
B. VERIFICATION: The Contractor shall verify measurements on the drawings before beginning work...
C. MATERIALS, MACHINERY, EMPLOYEES: Except as otherwise noted, the Contractor shall provide and pay for all materials, labor, tools...
D. SURVEYS, PERMITS, REGULATIONS: The Owner shall furnish an adequate survey of the property...
E. PROTECTION OF WORK, PROPERTY AND PERSON: The Contractor shall adequately protect the work, adjacent property, and the public...
F. CHANGES IN THE WORK: The Owner may order changes in the work, and the contract sum being adjusted accordingly...
G. CORRECTION OF WORK: The Contractor shall re-execute any work that fails to conform to the requirements of the contract...
H. Owner's Authorized Representative: The Owner's authorized representative acts as the authorized representative of the Owner in conjunction with the project manager...
I. CLARIFICATION OF DRAWINGS BEFORE BIDDING: After reviewing the drawings thoroughly it is the Contractor's responsibility to check the drawings...
J. SAMPLES: The Owner's Representative reserves the right to take and analyze samples of materials for conformity to specifications at any time...
K. PRE-CONSTRUCTION CONFERENCE: Schedule a pre-construction meeting with the Owner's Representative at least seven (7) days before beginning work...

015639
Tree and Plant Protection

PART 1 GENERAL

- 1.1 SUMMARY
The scope of work includes all labor, materials, tools, equipment, facilities, transportation and services necessary for, and incidental to performing all operations in connection with protection of existing trees and other plants as shown on the drawings and as specified herein.
2. Provide preconstruction evaluations
3. Provide tree and plant protection fencing
4. Provide protection of root zones and above ground tree and plants
5. Provide pruning of existing trees and plants
6. Coordinate with the requirements of Section Planting Soil for modifications to the soil within the root zone of existing trees and plants
7. Provide all insect and disease control
8. Provide maintenance of existing trees and plants including irrigation during the construction period as recommended by the arborist report
9. Remove tree protection fencing and other protection from around and under trees and plants
10. Clean up and disposal of all excess and surplus material.

- 1.2 CONTRACT DOCUMENTS
A. Shall consist of specifications and general conditions and the drawings, the intent of these documents is to include all labor, materials, and services necessary for the proper execution of the work.
B. It is the intent of this section that the requirements apply to all sections of the project specification such that any subcontractor must comply with the restrictions on work within designated Tree and Plant Protection Areas.
1.3 RELATED DOCUMENTS AND REFERENCES
A. Related Documents:
1. Drawings and general provisions of contract including general and supplementary conditions and Division I specifications apply to work of this section.
2. Section - Planting
B. References: The following specifications and standards of the organizations and documents listed in this paragraph form a part of the specification to the extent required by the references thereto.
1. ANSI A300 (part 5) - Standard Practices for Tree, Shrub and other Woody Plant Maintenance, most current editions.
2. Pruning practices shall conform with recommendations "Structural Pruning: A Guide For The Green Industry", Published by Urban Tree Foundation, Visalia, California; most current edition.
3. Glossary of Arboricultural Terms, International Society of Arboriculture, Champaign IL, most current edition.

- 1.4 VERIFICATION
A. All scaled dimensions on the drawings are approximate. Before proceeding with any work, the Contractor shall carefully check and verify all dimensions and quantities, and shall immediately inform the Owner's Representative of any discrepancies between the information on the drawings and the actual conditions, refraining from doing any work in said areas until given approval to do so by the Owner's Representative.
1.5 PERMITS AND REGULATIONS
A. The Contractor shall obtain and pay for all permits related to this section of the work unless previously excluded under provision of the contract or general conditions.
B. Wherever references are made to standards or codes in accordance with which work is to be performed or tested, the edition or revision of the standards and codes current on the effective date of this contract shall apply, unless otherwise expressly set forth.
C. In case of conflict among any referenced standards or codes or between any referenced standards and codes and the specifications, the more restrictive standard or code or Owner's Representative shall determine which shall govern.
1.6 PROTECTION OF WORK, PROPERTY AND PERSON
A. The Contractor shall protect the work, adjacent property, and the public, and shall be responsible for any damages or injury due to his/her actions.
1.7 CHANGES IN THE WORK
A. The Owner's Representative may order changes in the work, and the contract sum should be adjusted accordingly.
1.8 CORRECTION OF WORK
A. The Contractor shall re-execute any work that fails to conform to the requirements of the contract and shall remedy defects due to faulty materials or workmanship upon written notice from the Owner's Representative, at the soonest possible time that can be coordinated with other work and seasonal weather demands.
1.9 DEFINITIONS
All terms in this specification shall be as defined in the "Glossary of Arboricultural Terms" or as modified below.

- C. Shrub: Woody plants with mature height approximately less than 25 feet.
D. Tree and Plant Protection Area: Area surrounding individual trees, groups of trees, shrubs, or other vegetation to be protected during construction, and defined by a circle centered on the trunk with each tree with a radius equal to the crown drip line unless otherwise indicated by the owner's representative.
E. Tree: Single and multi-stemmed plants, including palms with anticipated mature height approximately greater than 25 feet or any plant identified on the plans as a tree.

- 1.10 SUBMITTALS
A. PRODUCT DATA: Submit manufacturer product data and literature describing all products required by this section to the Owner's Representative for approval.
1.11 OBSERVATION OF THE WORK
A. The Owner's Representative may inspect the work at any time.
1.12 PRE-CONSTRUCTION CONFERENCE
A. Schedule a pre - construction meeting with the Owner's Representative at least seven (7) days before beginning work to review any questions the Contractor may have regarding the work, administrative procedures during construction and project work schedule.
1. The following Contractors shall attend the preconstruction conference:
a. General Contractor.
b. Subcontractor assigned to install Tree and Plant Protection measures.
c. Earthwork Contractor.
d. All site utility Contractors that may be required to dig or trench into the soil.
f. Landscaping subcontractor.
g. Irrigation subcontractor
B. Prior to this meeting, mark all trees and plants to remain and or to be removed as described in this specification for review and approval by the Owner's Representative.

- 1.13 QUALITY ASSURANCE
A. Contractor qualifications:
1. All pruning, branch cut back, tree removal, root pruning, and fertilizing required by this section shall be performed by or under the direct supervision of ISA Certified Arborist Submit aforementioned individual's qualifications for approval by the Owner's Representative.
2. All applications of pesticide or herbicide shall be performed by a person maintaining a current state license to apply chemical pesticides valid in the jurisdiction of the project.
2.3 TREE PROTECTION FENCING:
B. PLASTIC MESH FENCE: Heavy - duty orange plastic mesh fencing fabric 48 inches wide, Fencing shall be attached to metal "U" or "T" post or wooden post driven into the ground of sufficient depth to hold the fabric securely in place without sagging.
C. GATES: For each fence type and in each separate fence area, provide a minimum of one 3 foot wide gate.
D. Submit suppliers product data that product meets the requirements for approval.
2.4 Tree protection sign:
A. Heavy-duty cardboard signs, 8.5 inches x 11 inches, white colored background with black 2 inch high or larger letter black letters.
2.5 TREE GROWTH REGULATOR (TGR)
A. Combiat 25C.
B. Submit suppliers product data that product meets the requirements for approval.

- 2.6 MAINTING
A. Mating for vehicle and work protection shall be heavy duty matting designed for vehicle loading over tree roots, Altumats as manufactured by Altumats, Inc.
B. Submit suppliers product data that product meets the requirements for approval.
2.7 GEGRID
A. Geogrid shall be woven polyester fabric with PVC coating, Uni-axial or biaxial geogrid, inert to biological degradation, resistant to naturally occurring chemicals, alikals, acids.
1. Geogrid shall be Miragrid 2XT as manufactured by Ten Cate Nicolon, Norcross, GA.
B. Filter FABRIC
A. Filter Fabric shall be nonwoven polypropylene fibers, inert to biological degradation and resistant of naturally occurring chemicals, alikals and acids.
1. Mirofl 135 as manufactured by Ten Cate Nicolon, Norcross, GA.
B. Submit suppliers product data that product meets the requirements for approval.

- 3.1 SITE EXAMINATION
A. Examine the site, tree, plant and soil conditions.
3.2 COORDINATION WITH PROJECT WORK
A. The Contractor shall coordinate with all other work that may impact the completion of the work.
3.3 TREE AND PLANT PROTECTION AREA: The Tree and Plant Protection Area is defined as all areas indicated on the tree protection plan.
3.4 Preparation:
A. Prior to the preconstruction meeting, layout the limits of the Tree and Plant Protection Area and then alignment of required Tree and Plant Protection Fencing and root pruning.
B. Flag all trees and shrubs to be removed by wrapping orange plastic ribbon around the trunk and obtain the Owner's Representative's approval of all trees and shrubs to be removed prior to the start of tree and shrub removal.
3.5 SOIL MOISTURE
A. Volumetric soil moisture level shall be measured with a digital, electric conductivity meter.
B. The Contractor shall confirm the soil moisture levels with a moisture meter.
3.6 ROOT PRUNING:
A. Prior to any excavating into the existing soil grade within 25 feet of the limit of the Tree and Plant Protection Area or trees to remain, root prune oil existing trees to a depth of 24 inches below existing grade in alignment following the edges of the Tree and Plant Protection Area or as directed by the Owner's Representative.
3.7 INSTALLATION OF GEOGRIDS, FILTER FABRIC, MATING, WOOD CHIPS AND OR MULCH
A. Install Geogrids, Filter Fabric, matting, Wood Chips and or Mulch in areas and depths shown on the plans and details or as directed by the Owner's Representative.
3.8 PROTECTION OF WORK, PROPERTY AND PERSON
A. The Contractor shall protect the work, adjacent property, and the public, and shall be responsible for any damages or injury due to his/her actions.
1.7 CHANGES IN THE WORK
A. The Owner's Representative may order changes in the work, and the contract sum should be adjusted accordingly.
1.8 CORRECTION OF WORK
A. The Contractor shall re-execute any work that fails to conform to the requirements of the contract and shall remedy defects due to faulty materials or workmanship upon written notice from the Owner's Representative, at the soonest possible time that can be coordinated with other work and seasonal weather demands.
1.9 DEFINITIONS
All terms in this specification shall be as defined in the "Glossary of Arboricultural Terms" or as modified below.

- 3.8 PROTECTION:
A. Protect the Tree and Plant Protection Area at all times from compaction of the soil; damage of any kind to trunks, bark, branches, leaves and roots of all plants; and contamination of the soil, bark or leaves with construction materials, debris, silt, fuels, oils, and any chemicals substance.
3.9 GENERAL REQUIREMENTS AND LIMITATIONS FOR OPERATIONS WITHIN THE TREE AND PLANT PROTECTION AREA:
A. The Contractor shall not engage in any construction activity within the Tree and Plant Protection Area without the approval of the Owner's Representative including: operating, moving or storing equipment; storing supplies or materials; locating temporary facilities including trailers or portable toilets and shall not permit employees to traverse the area to access adjacent areas of the project or use the area for lunch or any other work breaks.
B. In the event that construction activity is unavoidable within the Tree and Plant Protection Area, notify the Owner's Representative and submit a detailed written plan of action for approval.
1.21 WEED REMOVAL
A. During the construction period, control any plants that seed in and around the fenced Tree and Plant Protection area at least three times a year.
1. All plants that are not shown on the planting plan or on the Tree and Plant Protection Plan to remain shall be considered for removal.
B. At the end of the construction period provide one final weeding of the Tree and Plant Protection Area.
1.3 INSECT AND DISEASE CONTROLLER
A. Monitor all plants to remain for disease and insect infestations during the entire construction period.
3.16 CLEAN UP
A. During tree and plant protection work, keep the site free of trash, pavements reasonably clean and work area in an orderly condition at the end of each day.
3.17 REMOVAL OF FENCING AND OTHER TREE AND PLANT PROTECTION
A. At the end of the construction period and when requested by the Owner's Representative remove all fencing, Wood Chips or Mulch, Geogrids and Filter Fabric, trunk protection and or any other Tree and Plant Protection material.
3.18 DAMAGE OR LOSS TO EXISTING PLANTS TO REMAIN

- 1. In general, demolition and excavation within the dip line of trees and shrubs shall proceed with extreme care either by the use of hand tool, directional boring and or Air Knife excavation where indicated or with other low impact equipment that will not cause damage to the tree, roots or soil.
2. When encountered, exposed roots, 1 inches and larger in diameter shall be worked around in a manner that does not break the outer layer of the root surface (bark).
3. Trunk Protection: Protect the trunk of each tree to remain by covering it with a ring of 8 foot long 2 inch x 6 -inch planks loosely banded onto the tree with 3 steel bands.
4. Matting: Install temporary matting over the Wood Chips or Mulch to the extent indicated.
5. Trunk Protection: Protect the trunk of each tree to remain by covering it with a ring of 8 foot long 2 inch x 6 -inch planks loosely banded onto the tree with 3 steel bands.
6. Air Excavation Tool: If excavation for footings or utilities is required within the Tree and Plant Protection Area, air excavation tool techniques shall be used where practical or as designed on the drawings.
7. Mulch, fertilizer, stake, and all other specified plants.
8. Clean up and disposal of oil excess and surplus material.
9. Maintenance of all specified plants during the warranty period.
10. CONTRACT DOCUMENTS
A. Shall consist of specifications and general conditions and the construction drawings.
1.3 RELATED DOCUMENTS AND REFERENCES
A. Related Documents:
1. Drawings and general provisions of contract including general and supplementary conditions and Division I specifications apply to work of this section
2. Related Specification Sections
a. Section - Tree Protection and Plant Protection
B. References: The following specifications and standards of the organizations and documents listed in this paragraph form a part of the specification to the extent required by the references thereto.
1. State of California, Department of Food and Agriculture, Regulations for Nursery Inspectors, Rules and Grading.
2. ANSI Z60.1 American Standard for Nursery Stock, most current edition.
3. ANSI A300 - Standard Practices for Tree, Shrub and other Woody Plant Maintenance, most current edition and parts.
4. Florida Grades and Standards for Nursery Stock, current edition (Florida Department of Agriculture, Tallahassee FL).
5. Interpretation of plant names and descriptions shall reference the following documents:
6. Pruning practices shall conform to recommendations "Structural Pruning: A Guide For The Green Industry" most current edition published by Urban Tree Foundation, Visalia, California.
7. Glossary of Arboricultural Terms, International Society of Arboriculture, Champaign IL, most current edition.

- 1.1 SUMMARY
The scope of work includes all labor, materials, appliances, tools, equipment, facilities, transportation and services necessary for, and incidental to performing all operations in connection with furnishing, delivery, and installation of plant (also known as "landscaping") complete as shown on the drawings and as specified herein.
B. The scope of work in this section includes, but is not limited to, the following:
1. Locate, purchase, deliver and install all specified plants.
2. Water, protect specified plants.
3. Mulch, fertilizer, stake, and all other specified plants.
4. Maintenance of all specified plants until the beginning of the warranty period.
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- B. Any trees or plants designated to remain and which are damaged by the Contractor shall be replaced in kind by the Contractor at their own expense.
C. Plants that are damaged shall be considered as requiring replacement or approval in the event that the damage affects more than 25 % of the crown, 25% of the trunk circumference, or root protection area, or the tree is damaged in such a manner that the tree could develop into a potential hazard.
1. All trees and plants shall be installed per the requirements of Specification Section Planting.
2. Plants that are damaged shall be considered as requiring replacement or approval in the event that the damage affects more than 25 % of the crown, 25% of the trunk circumference, or root protection area, or the tree is damaged in such a manner that the tree could develop into a potential hazard.
3. The Owner's Representative may engage an independent arborist to assess any tree or plant that appears to have been damaged to determine their health or condition.
4. Any tree that is determined to be dead, damaged or potentially hazardous by the Owner's arborist and upon the request of the Owner's Representative shall be immediately removed by the Contractor at no additional expense to the Owner.
5. Remedial work may extend up to two years following the completion of construction to allow for any requirements of multiple applications or the need to undertake applications of required seasons of the year.
6. Any remedial work on damaged existing plants recommended by the consulting arborist shall be completed by the Contractor at no cost to the owner.
7. Stem girdling root: Any root more than 1/2 inch diameter currently touching the trunk, or with the potential to touch the trunk, above the root collar approximately tangential to the trunk circumference or circling the trunk.
8. Spade harvested and transplanted: Field grown trees that are mechanically harvested and immediately transplanted to the final growing site without being removed from the digging machine.
9. Stem: The trunk of the tree.
10. Substantial Completion Acceptance: The date at the end of the Planning, Planting Soil, and Irrigation installation where the Owner's Representative accepts that all work in these sections is complete and the Warranty period has begun.
11. Structural root: One of the largest roots emerging from the root collar.
12. Tree: Single and multi-stemmed plants with mature height approximately greater than 15 feet.
1.10 SUBMITTALS
A. See contract general conditions for policy and procedure related to submittals.
B. Submit all product submittals 4 weeks prior to installation of plants.
C. Product data: Submit manufacturer product data and literature describing all products required by this section to the Owner's Representative for approval.
D. Plant grower certificates: Submit plant grower's certificates for all plants indicating that each meets the requirements of the specification, including the requirements of free quality, to the Owner's Representative for approval.
E. Samples: Submit samples of each product and material where required by the specification to the Owner's Representative for approval.
F. Plant sources: Submit sources of all plants as required by Article - "Selection of Plants" to the Owner's Representative for approval.
G. Close out submittals: Submit to the Owner's Representative for approval.
1. Plant maintenance data and requirements.
2. Warranty period site visit report: If there is no maintenance during the warranty period, after each site visit during the warranty period, by the Contractor, as required by this specification, submit a written record of the visit, including any problems, potential problems, and any recommended corrective action to the Owner's Representative for approval.
1.11 OBSERVATION OF THE WORK
A. The Owner's Representative may observe the work at any time.
1. SITE CONDITIONS PRIOR TO THE START OF PLANTING: review the soil and drainage conditions.
2. COMPLETION OF THE PLANT LAYOUT STAKING: Review of the plant layout.
3. PLANT QUALITY: Review of plant quality of the time of delivery and prior to installation.
4. COMPLETION OF THE PLANTING: Review the completed planting.
1.12 PRE-CONSTRUCTION CONFERENCE
A. Schedule a pre-construction meeting with the Owner's Representative at least seven (7) days before beginning work to review any questions the Contractor may have regarding the work, administrative procedures during construction and project work schedule.
1.13 QUALITY ASSURANCE
A. Substantial Completion Acceptance - Acceptance of the work prior to the start of the warranty period:
1. Once the Contractor completes the installation of all items in this section, the Owner's Representative will observe work for Substantial Completion Acceptance upon written request of the Contractor.
2. Substantial Completion Acceptance by the Owner's Representative shall be for general conformance to specified size, character and quality and not relieve the Contractor of responsibility for full conformance to the contract documents, including contract specifics.
3. Any plants that are deemed defective as defined under the provisions below shall not be accepted.
4. The Owner's Representative will provide the Contractor with written acknowledgment of the date of Substantial Completion Acceptance and the beginning of the warranty period and plant maintenance period (if plant maintenance is included).
5. Contractor's Quality Assurance Responsibilities: The Contractor is solely responsible for quality control of the work.
6. Installer Qualifications: The installer shall be a firm having at least 5 years of successful experience of a scope similar to that required for the work, including the handling and planting of large specimen trees in urban areas.
7. The bidder list for work under this section shall be approved by the Owner's Representative.
8. Installer Field Supervision: When any planting work is in progress, installer shall maintain, on site, a full-time supervisor who can communicate in English with the Owner's Representative.
9. Installer's field supervisor shall have a minimum of five years experience as a field supervisor installing plants and trees of the quality and scale of the proposed project, and can communicate in English with the Owner's Representative.
10. The installer's crew shall have a minimum of 3 years experienced in the installation of Planting Soil, Plantings, and Irrigation (where applicable) and interpretation of soil plans, planting plans and irrigation plans.
1.14 PLANT WARRANTY:
1. The Contractor agrees to replace defective work and defective plants.
2. Plants determined to be defective shall be removed immediately upon notification by the Owner's Representative and replaced without cost to the Owner, as soon as weather conditions permit and within the specified planting period.
3. Any work required by this specification of the Owner's Representative during the progress of the work, to correct plant defects including the removal of roots or branches, or planting plants that have been banded rooted during installation to observe for or correct root defects shall not be considered as grounds to void any conditions of the contract price resulting from changes in the work.
4. The Contractor decides that such remediation work may compromise the future health of the plant, the plant or plants in question shall be rejected and replaced with plants that do not contain defects that require remediation or correction.
5. The warranty of all replacement plants shall extend for an additional one-year period from the date of their acceptance after replacement.
6. The warranty of all replacement plants shall extend for an additional one-year period from the date of their acceptance after replacement.
7. During and by the end of the warranty period, remove all tree wrap, ties, and guying unless agreed to by the Owner's Representative to remain in place.
8. The warranty of all replacement plants shall extend for an additional one-year period from the date of their acceptance after replacement.
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1.15 SELECTION AND OBSERVATION OF PLANTS

A. The Owner's Representative may review all plants subject to approval of size, health, quality, character, etc. Review or approval of any plant during the process of selection, delivery, installation and establishment period shall not prevent that plant from later rejection in the event that the plant quality changes or previously existing defects become apparent that were not observed.

B. Plant Selection: The Owner's Representative reserves the right to select and observe all plants of the nursery prior to delivery and to reject any plants that do not meet specifications as set forth in this specification. If a particular defect or substandard element can be corrected at the nursery, as determined by the Owner's Representative, the agreed upon remedy may be applied by the nursery or the Contractor provided that the correction allows the plant to meet the requirements set forth in this specification. Any work to correct plant defects shall be at the contractor's expense.

1. The Owner's Representative may make invasive observation of the plant's root system in the area of the root collar and the top of the root ball in general in order to determine that the plant meets the quality requirements for depth of the root collar and presence of roots above the root collar. Such observations will not harm the plant.

2. Corrections are to be undertaken at the nursery prior to shipping.

C. The Contractor shall bear all cost related to plant corrections.

D. All plants that are rejected shall be immediately removed from the site and acceptable replacement plants provided at no cost to the Owner.

E. Submit to the Owner's Representative, for approval, plant sources including the names and locations of nurseries proposed as sources of acceptable plants, and a list of the plants they will provide. The plant list shall include the botanical and common name and the size at the time of selection. Observe all nursery materials to determine that the materials meet the requirements of this section.

F. The Contractor shall require the grower or re-wholesaler supplier to permit the Owner's Representative to observe the root system of all plants at the nursery or job site prior to planting including removal of soil or substrate around the base of the plant. Observation may be as frequent and as extensive as needed to verify that the plants meet the requirements of the specifications and conform to requirements.

G. Where requested by the Owner's Representative, submit photographs of plants or representative samples of plants. Photographs shall be legible and clearly depict the plant specimen. Each submitted image shall contain a rigid rectangular scale. The approval of plants by the Owner's Representative via photographs does not preclude the Owner's Representative's right to reject material while on site.

1.16 PLANT SUBSTITUTIONS FOR PLANTS NOT AVAILABLE

A. Submit all requests for substitutions of plant species, or size to the Owner's Representative, for approval, prior to purchasing the proposed substitution. Request for substitution shall be accompanied with a list of nurseries contacted in the search for the required plant and a record of other attempts to locate the required material. Requests shall also include sources of plants found that may be of a smaller or larger size, or a different shape or habit than specified, or plants of the same genus and species but different cultivar origin, or which may otherwise not meet the requirements of the specifications, but which may be available for substitution.

1.17 SITE CONDITIONS

A. It is the responsibility of the Contractor to be aware of all surface and sub-surface conditions, and to notify the Owner's Representative, in writing, of any circumstances that would negatively impact the health of plantings. Do not proceed with work until unsatisfactory conditions have been corrected.

1. Should subsurface drainage or soil conditions be encountered which would be detrimental to growth or survival of plant material, the Contractor shall notify the Owner's Representative in writing, stating the conditions and submit a proposed covering soil. The approval of plants by the Owner's Representative of such conditions, he/she shall remain responsible for plant material under the warranty clause of the specifications.

B. It is the responsibility of the Contractor to be familiar with the local growing conditions, and if any specified plants will be in conflict with these conditions. Report any potential conflicts, in writing, to the Owner's Representative.

C. This specification requires that all Planting Soil and Irrigation (if applicable) work be completed and accepted prior to the installation of any plants.

1. Planting operations shall not begin until such time that the irrigation system is completely operational for the areas(s) to be planted, and the irrigation system for that area has been preliminarily observed and approved by the Owner's Representative.

D. Actual planting shall be performed during those periods when weather and soil conditions are observed in accordance with locally accepted horticultural practices.

1. Do not install plants into saturated or frozen soils. Do not install plants during inclement weather, such as rain or snow or during extremely hot, cold or windy conditions.

1.18 PLANTING AROUND UTILITIES

A. Contractor shall carefully examine the civil, record, and survey drawings to become familiar with the existing underground conditions before digging.

B. Determine location of underground utilities and perform work in a manner that will avoid possible damage. Hand excavate, as required. Maintain grade stakes set by others until parties concerned mutually agree upon removal.

C. Notification of Local Utility Locator Service, Sunshine 811, is required for all planting areas; the Contractor is responsible for knowing the location and avoiding utilities that are not covered by Sunshine 811.

PART 2 PRODUCTS

2.1 PLANTS - GENERAL

A. Standards and measurement: Provide plants of quantity, size, genus, species, and variety or cultivars as shown and scheduled in contract documents.

1. All plants including the root ball dimensions or container size to trunk caliper ratio shall conform to ANSI Z60.1 "American Standard for Nursery Stock" latest edition, unless modified by provisions in this specification. When there is a conflict between this specification and ANSI Z60.1, this specification section shall be considered correct.

2. Plants larger than specified may be used if acceptable to the Owner's Representative. Use of such plants shall not increase the contract price. If larger plants are accepted the root ball size shall be in accordance with ANSI Z60.1. Larger plants may not be acceptable if the resulting root ball cannot fit into the required planting space.

3. If a range of size is given, no plant shall be less than the minimum size and not less than 50 percent of the plants shall be as large as the maximum size specified. The measurements specified are the minimum and maximum size acceptable and are the measurements after pruning, where pruning is required.

B. Proper identification: All trees shall be true to name as ordered or shown on planting plans.

C. Compliance: All trees shall comply with federal and state laws and regulations requiring observation for plant disease, pest, and weeds. Observation certificates required by law shall accompany each shipment of plants.

D. Plant Quality:

1. General: Provide healthy stock, grown in a nursery and reasonably free of die-back, disease, insects, eggs, borers, and other pests. All plants shall have a strong, sturdy stem, and branch form that will not restrict normal growth, stability and health for the expected life of the plant.

2. Plant quality above the soil line:

a. Plants shall be healthy with the color, shape, size and distribution of trunk, stems, branches, buds and leaves normal to the plant type specified. Tree quality above the soil line shall comply with the Florida Grapes and Standards Tree grade Florida Fancy or Florida #1 and the following:

- 1. Crown: The form and density of the crown shall be typical for a young specimen of the species or cultivar prepared to a central and dominant leader.
a.) Crown specifications do not apply to plants that have been specifically trained in the nursery as topiary, espalier, multi-stem, clump, or unique selection, such as container or weeping cultivars.
2. Leaves: The size, color, and appearance of leaves shall be typical for the time of year and stage of growth of the species or cultivar. Trees shall not show signs of prolonged moisture stress or over watering as indicated by wilted, shriveled, or dead leaves.
3. Branches: Shoot growth (length and diameter) throughout the crown should be appropriate for the age and size of the species or cultivar. Trees shall not have dead, diseased, broken, distorted, or otherwise injured branches.
a.) Main branches shall be distributed along the central leader not clustered together. They shall form a balanced crown appropriate for the cultivar/species.
b.) Branch diameter shall be no larger than two-thirds (one-half is preferred) the diameter of the central leader measured 1 inch above the branch union.
c.) The attachment of the largest branches (scaffold branches) shall be free of included bark.
4. Trunk: The tree trunk shall be relatively straight, vertical, and free of wounds that penetrate to the wood (properly made pruning cuts, closed or not, are acceptable and are not considered wounds), sunburned areas, conks (fungal fruiting bodies), wood boring insects, wood borers, sap leopards, signs of boring insects, galls, cankers, girdling ties, or lesions (mechanical injury).

3. Trees shall have one central leader. If the leader was headed, a new leader (with a live terminal bud) of at least one-half the diameter of the pruning cut shall be present.
1.) All trees are assumed to have one central leader trees unless a different form is specified in the plant list or drawings.

4. All graft unions, where applicable, shall be completely closed without visible sign of graft rejection. All grafts shall be visible above the soil line.

5. Trunk caliper and taper shall be sufficient so that the lower five feet of the trunk remains vertical without a stake. Auxiliary stake may be used to maintain a straight leader in the upper half of the tree.

3. Plant quality at or below the soil line:

a. Plant roots shall be normal to the plant type specified. Root observations shall take place without inspecting tree health. Root quality at or below the soil line shall comply with the project Root Acceptance details and the following:

- 1.) The roots shall be reasonably free of scrapes, broken or split wood.
2.) The root system shall be reasonably free of injury from biotic (e.g., insects and pathogens) and abiotic (e.g., herbicide toxicity and salt injury) agents. Wounds resulting from root pruning used to produce a high quality root system are not considered injuries.
3.) A minimum of three structural roots reasonably distributed around the trunk (not clustered on one side) shall be present. Root distribution shall be uniform throughout the root ball, and growth shall be appropriate for the species.
a.) Plants with structural roots on only one side of the trunk (J roots) shall be rejected.
4.) The root collar shall be within the upper 2 inches of the substrate/soil. Two structural roots shall reach the side of the root ball near the top surface of the root ball. The grower may request a modification to this requirement for species with roots that rapidly descend, provided that

the grower removes all stem girdling roots above the structural roots across the top of the root ball.

5.) The root system shall be reasonably free of stem girdling roots over the root collar or knicked roots from nursery production practices.

6.) All signs of observations and delivery, the root ball shall be moist throughout. Roots shall not show signs of excess soil moisture conditions as indicated by stunted, discolored, distorted, or dead roots.

E. Submittals: Submit for approval the required plant quality certifications from the grower where plants are to be purchased, for each plant type. The certification must state that each plant meets all the above plant quality requirements.
1. The grower's certification of plant quality does not prohibit the Owner's Representative from observing any plant or rejecting the plant if it is found to not meet the specification requirements.

2.2 ROOT BALL PACKAGE OPTIONS: The following root ball packages are permitted. Specific root ball packages shall be required where indicated on the plant list or in this specification. Any type of root ball packages that is not specifically defined in this specification shall not be permitted.

A. BALLED AND BURAPPED PLANTS

2. All Balled and Burrapped Plants shall be field grown, and the root ball packaged in a burlap and twine and/or burlap and wire basket package.

3. Plants shall be harvested with the following modifications to standard nursery practices.

a. Prior to digging any tree that falls to meet the requirement for maximum soil and roots above the root collar, carefully removed the soil from the top of the root ball of each plant, using hand tools, water or an air spade, to locate the root collar and obtain the soil depth over the structural roots requirements. Remove all stem girdling roots above the root collar. Care must be exercised not to damage the surface of the root collar and the top of the structural roots.

b. Trees shall be dug for a minimum of 4 weeks and a maximum of 52 weeks prior to shipping. Trees dug 4 to 52 weeks prior to shipping are defined as hardened off. Digging is defined as cutting all roots and lifting the tree out of the ground and either moving it to a new location in the nursery or placing it back into the same hole. Trees that are stored out of the ground should be placed in a holding area protected from extremes of wind and sun with the root ball protected by covering with mulch or straw and irrigated sufficiently to keep moisture in the root ball above will point and below saturation.

c. If wire baskets are used to support the root ball, a "low profile" basket shall be used. A low profile basket is defined as having the top of the highest loops on the basket no less than 4 inches and no greater than 8 inches below the shoulder of the root ball package. The basket shall be removed completely or time of planting.

1.) At nurseries where sandy soils prevent the use of "low profile baskets", baskets that support the entire root ball, including the top, are allowable.

d. Twine and burlap used for wrapping the root ball package shall be natural, biodegradable material. If the burlap decomposes after digging the tree then the root ball shall be re-wrapped prior to shipping if roots have not yet grown to keep root ball intact during shipping.

SPADE HARVESTED AND TRANSPLANTED

1. Spade Harvested and Transplanted Plants shall meet all the requirements for field grown trees. Root ball diameters shall be of similar size as the ANSI Z60.1 requirements for Balled and Burrapped plants.

2. Trees shall be harvested prior to leaving out (bud break) in the spring or during the fall planting period except for plants known to be considered as fall planting hazards. Plants that are fall planting hazards shall only be harvested prior to leaving out in the spring.

3. Trees shall be moved and planted within 48 hours of the initial harvesting and shall remain in the spade machine until planted.

C. CONTAINER (INCLUDING ABOVE-GROUND FABRIC CONTAINERS AND BOXES) PLANTS

4. Container plants may be permitted only when indicated on the drawing, in this specification, or approved by the Owner's Representative.

5. Provide plants shall be established and well rooted in removable containers.

6. Container class size shall conform to ANSI Z60.1 for container plants for each size and type of plant.

D. BARE ROOT PLANTS

7. Harvest bare root plants while the plant is dormant and a minimum of 4 weeks prior to leaf out (bud break).

8. The root spread dimensions of the harvested plants shall conform to ANSI Z60.1 for nursery grown bare root plants for each size and type of plant. Just prior to shipping to the job site, dip the root system into a slurry of hydrogel (cross linked polyacrylamide) and water mixed at a rate of 15 cc of hydrogel in 25 gallons of water. Do not shake off the excess hydrogel. Place the root system in a pleated black plastic bag and tie the bag snugly around the trunk. Bundle and tie the upper branches together.

9. Keep the trees in a cool dark space for storage and delivery. If daytime outside temperatures exceeds 70 degrees F, utilize a refrigerated storage area with temperature between 35 and 50 degrees.

10. Where possible, plant time of planting to be before bud break. For trees to be planted after bud break, place the trees before bud break in an irrigated bed at peat gravel.

a. The peat gravel bed shall be 18 inches deep over a sheet of plastic.

b. Spade stored to allow the unbudged branches to grow without shading each other.

c. Once stored in peat gravel, allow the trees sufficient time for the new root system to flush and spring growth of leaves to fully develop before planting.

d. Peat gravel stored trees may be kept for up to one growing season.

e. Peat gravel stored trees shall be dipped, packaged and shipped similar to the requirements for freshly dug bare root trees above.

2.3 ANNUAL, FLOWERING AND SEASONAL COLOR PLANTS

E. Container or flat-grown plants should be sized as noted in the planting plan. Plants shall be well-rooted and healthy.

2.4 PALMS

F. Except as modified below or where the requirements are not appropriate to the specification of palms, palms shall meet all the requirements of the plant quality section above.

G. Defronding, tying, and hedging:

5. In preparing palm trees for relocation, all dead fronds shall be removed.

6. All remaining fronds above horizontal shall be lifted up and tied together around the crown in an upright position. Do not tie too tightly, bind or injure the bud. Jute binder twine shall be used in tying up the fronds; wire will not be permitted. Fronds shall be untied immediately after planting.

C. Digging the root ball:

1. When digging out the root ball, no excavation shall be done closer than 24 inches to the trunk at ground level and the excavation shall extend below the major root system to a minimum depth of 3.5 feet. The bottom of the root ball shall be cut off square and perpendicular to the trunk below the major root system.

D. The Contractor shall not free-fall, drop, roll or abuse the tree or put a strain on the crown (bud area) at any time. A protective device shall be used around the trunk of the tree while lifting and relocating so as not to injure the bud, or scar or skin the trunk in any way.

2.5 PLANTING SOIL

Planting Soil shall contain a mixture of 1/3 sand, 1/3 topsoil and 1/3 peat humus. Sand shall be clean, soil-free and containing no extraneous matter. Topsoil shall be friable fertile soil with representative characteristics of area soils. It should be free of heavy silt, stone, excess lime, shell, gravel, plant roots, debris or other foreign matter. If area soil contain noxious plant growth (such as Bermuda, Torpedo or nut grass), it shall first be treated with a rate of 5.0 to 7.0 unless otherwise specified and contain no toxic residue or substances that would endanger plant growth. If topsoil is not available on site, it shall be imported from local sources with similar soil characteristics to that found at project site, obtain topsoil only from naturally, well-drained sites where topsoil occurs in a depth not less than 4". Peat humus shall be decomposed peat with no identifiable fibers or if available, muck may be substituted and shall be free from stones, excessive plant roots, debris or other foreign matter. Muck shall not be overly saturated with water.

2.6 MULCH

A. Mulch shall be Melaleuca or Eucalyptus and shall cover all landscape bed areas in a 3" minimum layer. Do not let mulch pile up on root ball or around trunks of trees plants. Submit supplier's product specification data sheet and a one gallon sample for approval.

2.7 TREE STAKING AND GUYING MATERIAL

A. Tree guying to be flat woven polypropylene material, 3/4 inch wide, and 900 lb. break strength. Color to be Green. Product to be Arbolite manufactured by Deep Root Partners, LP, or approved equal.

B. Stakes shall be lodge pole stakes free of knots and diameters and lengths appropriate to the size of plant as required to adequately support the plant.

C. Below ground anchor systems to be constructed of 2 x 2 dimensional untreated wood securing (using 3 inch long screws) horizontal portions to 4 feet long vertical stakes driven straight into the ground outside the root ball.

D. Submit manufacturer's product data for approval.

2.8 WATERING BAGS

E. Plastic free watering bags holding a minimum of 15 gallons of water and with a slow drip hole(s) water release system, specifically designed to water establishing trees. Water should release over a several day period, not within a few hours.

F. Watering bags shall:

- 1. Tregator irrigation Bags sized to the appropriate model for the requirements of the plant, manufactured by Spectrum Products, Inc., Youngville, NC 27566.
2. Ooze Tube sized to the appropriate model for the requirements of the plant, manufactured by Engineered Water Solutions, Atlanta, GA.
3. Or approved equal.
C. Submit manufacturer's product data for approval.

PART 3 EXECUTION

3.1 DELIVERY, STORAGE AND HANDLING

A. Protect materials from deterioration during delivery and storage. Adequately protect plants from drying out, exposure of roots to sun, wind or extremes of heat and cold temperatures. If planting is delayed more than 24 hours after delivery, set plants in a location protected from sun and wind. Provide adequate water to the root ball package during the shipping and storage period.

1. All plant materials must be available for observation prior to planting.

2. Using a soil moisture meter, periodically check the soil moisture in the root balls of all plants to assure that the plants are being adequately watered. Volumetric soil moisture shall be maintained above wilting point and below field capacity for the root ball substrate or soil.

B. Do not deliver more plants to the site than there is space with adequate storage conditions. Provide a suitable remote storage area for plants and other supplies.

1. The Owner's Representative or Contractor shall approve the duration, method and location of storage of plants.

C. Provide protective covering over all plants during transporting.

3.2 ADVERSE WEATHER CONDITIONS

A. No planting shall take place during extremely hot, dry, windy or freezing weather.

3.3 COORDINATION WITH PROJECT WORK

A. The Contractor shall coordinate with all other work that may impact the completion of the work.

B. Prior to the start of work, prepare a detailed schedule of the work for coordination with other trades.

C. Coordinate the relocation of any irrigation lines, heads or the conduits of other utility lines that are in conflict with tree locations. Root balls shall not be altered to fit around lines. Notify the Owner's Representative of any conflicts encountered.

3.4 LAYOUT AND PLANTING SEQUENCE

A. Relative positions of all plants and trees are subject to approval of the Owner's Representative.

B. Notify the Owner's Representative, one (1) week prior to layout. Lay out all individual tree and shrub locations. Place plants above surface of planting location or place a labeled stake at planting location. Lay out bed lines with tie-up materials in the root ball above will point and below saturation.

C. When applicable, plant trees before other plants are installed.

D. It is understood that plants are not precise objects and that minor adjustments in the layout will be required as the planting plan is constructed. These adjustments may not be apparent until some or all of the plants are installed. Make adjustments as required by the Owner's Representative including relocating previously installed plants.

3.5 SOIL PROTECTION DURING PLANT DELIVERY AND INSTALLATION

A. Protect soil from compaction during the delivery of plants to the planting locations, digging of planting holes and installing plants.

1. Where possible deliver and plant trees that require the use of heavy mechanized equipment prior to final soil preparation and filling. Where possible, restrict the driving lanes to one area instead of driving over and compacting a large area of soil.

2. Till to a depth of 6 inches, all soil that has been driven over during the installation of plants.

3.6 SOIL MOISTURE

A. Volumetric soil moisture level, in both the planting soil and the root balls of all plants, prior to, during and after planting operations shall be above permanent wilting point and below field capacity for every type of soil texture within the following ranges:

Table with 3 columns: Soil type, Permanent wilting point, Field capacity. Rows include Sand, Loamy sand, Sandy loam, Sandy clay, Sandy clay loam, Clay loam, Silty clay, Silty loam.

1. Modifications, at the time of planting, to meet the specifications for the depth of the root collar and removal of stem girdling roots and circling roots may make the plant unstable or stress the plant to the point that the Owner's Representative may choose to reject the plant rather than permitting the modification.

5. Any modifications required by the Owner's Representative to make the root system conform to the plant quality standards outlined in Part 2 Products: Plants General; Quality, or other requirements related to the permitted root ball package, shall not be considered as grounds to modify or void the plant warranty.

6. The resulting root ball may need additional staking and water after planting. The Owner's Representative may reject the plant if the root modification process makes the tree unstable or if the tree is not healthy at the end of the warranty period. Such plants shall still be covered under the warranty.

7. The Contractor remains responsible to confirm that the grower has made all required root modifications noted during any nursery observations.

F. Container and Boxed Root Ball Shaving: The outer surfaces of ALL plants in containers and boxes, including the top, sides and bottom of the root ball shall be shaved to remove all circling, descending, and matted roots. Shaving shall be performed using saws, knives, sharp shovels or other suitable equipment that is capable of making clean cuts on the roots. Shaving shall remove a minimum of one inch of root mat or up to 2 inches or required to remove all root segments that are not growing reasonably radial to the trunk.

G. Exposed Stem Tissue after Modification: The required root ball modifications may result in stem tissue that has not formed trunk bark being exposed above the soil line. If such condition occurs, wrap the exposed portion of the stem in a protective wrapping with a white filter fabric. Secure the fabric with biodegradable masking tape. DO NOT use string, twine, green nursery ties or any other material that may girdle the trunk if not required.

H. Excavation of the Planting Space: Using hand tools or tracked mini-excavator, excavate the planting hole into the Planting Soil to the depth of the root ball measured after any root ball modification to correct root problems, and wide enough for working room around the root ball or to the site indicated on the drawing or as noted below.

1. For trees and shrubs planted in soil areas that are NOT filled or otherwise modified to a depth of at least 12 inches over a distance of more than 10 feet radius from each tree, or 5 feet radius from each shrub, the soil around the root ball shall be loosened as defined below or as indicated on the drawings:

a. The area of loosening shall be a minimum of 3 times the diameter of the root ball at the surface sloping to 2 times the diameter of the root ball at the depth of the root ball.

b. Loosening is defined as digging into the soil and turning the soil to reduce the compaction. The soil does not have to be removed from the hole, just dug, lifted and turned. Lifting and turning may be accomplished with a tracked mini excavator, or hand shovels.

2. If an auger is used to dig the initial planting hole, the soil around the auger hole shall be loosened as defined above for trees and shrubs planted in soil areas that are NOT filled or otherwise modified.

3. The measuring point for root ball depth shall be the average height of the outer edge of the root ball after any required root ball modification.

4. If motorized equipment is used to deliver plants to the planting area over exposed planting beds, or used to loosen the soil or dig the planting holes, all soil that has been driven over shall be filled to a depth of 6 inches.

H. For trees to be planted in prepared Planting Soil that is deeper than the root ball depth, compact the soil under the root ball using a mechanical tamper to assure a firm bedding for the root ball. If there is more than 12 inches of planting soil under the root ball excavate and tamp the planting soil in lifts not to exceed 12 inches.

I. Set top outer edge of the root ball at the average elevation of the proposed finish. Set the plant plumb and upright in the center of the planting hole. The tree graft, if applicable, shall be visible above the grade. Do not place soil on top of the root ball.

J. The Owner's Representative may request that plants orientation be rotated when planted based on the form of the plant.

K. Backfill the space around the root ball with the same planting soil or existing soil that was excavated for the planting space. See Specification Section Planting Soil, for requirements to modify the soil within the planting bed.

L. Brace root ball by tamping Planting Soil around the lower portion of the root ball. Place additional Planting Soil around base and sides of ball at six-inch (6") lifts. Lightly tamp each lift using foot pressure or hand tools to settle backfill, support the tree and eliminate voids. DO NOT over compact the backfill or use mechanical or pneumatic tamping equipment. Over compaction shall be defined as greater than 85% of maximum dry density, standard proctor or greater than 2500 psi as measured by a cone penetrometer when the volumetric soil moisture is lower than field capacity.

M. After the planting hole has been backfilled to three quarters of its depth, water shall be poured around the root ball and allowed to soak into the soil to settle the soil. Do not foot the planting space. If the soil is above field capacity, allow the soil to drain to below field capacity before finishing the planting. Air pockets shall be eliminated and backfill continued until the planting soil is brought to grade level.

N. Where indicated on the drawings, build a 4 inch high, level berm of Planting Soil around the outside of the root ball to retain water. Tamp the berm to reduce leaking and erosion of the saucer.

O. Thoroughly water the Planting Soil and root ball immediately after planting.

P. Remove all nursery plant identification tags and ribbons as per Owner's Representative instructions. The Owner's Representative's seals are to remain on plants until the end of the warranty period.

P. Remove congregate cardboard trunk protection after planting.

Q. Follow additional requirements for the permitted root ball packages.

3.8 Permitted Root Ball Packages and Special planting requirements

A. The following are permitted root ball packages and special planting requirements that shall be followed during the planting process in addition to the above General planting requirements.

B. BALLED AND BURAPPED PLANTS

1. After the root ball has been backfilled, remove all twine and burlap from the top of the root ball. Cut the burlap away; do not fold down onto the Planting Soil.

2. If the plant is shipped with a wire basket that does not meet the requirements of a "Low Rise" basket, remove the top 2-8 inches of the basket wires just before the final backfilling of the tree.

3. Earth root balls shall be kept intact except for any modifications required by the Owner's Representative to make root package comply with the requirement in Part 2 Products.

C. SPADE HARVESTED AND TRANSPLANTED PLANTS

1. After installing the tree, loosen the soil along the seam between the root ball and the surrounding soil out to a radius from the root ball edge equal to the diameter of the root ball to a depth of 8 - 10 inches by hand digging to disturb the soil interface.

2. Fill any gaps below the plant with loose soil.

D. CONTAINER (INCLUDES BOXED AND ABOVE-GROUND FABRIC CONTAINERS) PLANTS

1. This specification assumes that most container plants have significant stem girdling and circling roots, and that the root collar is too low in the root ball.

2. Remove the container.

3. Perform root ball shaving as defined in Installation of Plants: General above.

4. Remove all roots and substrate above the root collar and the main structural roots according to root correction details so root system conforms to root observations detail.

5. Remove all substrate at the bottom of the root ball that does not contain roots.

6. Using a hose, power washer or air excavation device, wash out the substrate from around the trunk and top of the remaining root ball and find and remove all stem girdling roots within the root ball above the top of the structural roots.

E. BARE ROOT PLANTS