

SECTION 02951

TREE PLANTING

07/97

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

ANSI Z60.1 (1986) American Standard for Nursery Stock

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM D 2607 (1969) Peats, Mosses, Humus, and Related Products

FEDERAL SPECIFICATIONS (FS)

FS 0-F-241 (Rev D) Fertilizers, Mixed, Commercial

1.2 SUBMITTALS

Government approval is required for submittals with a "GA" designation; submittals having an "FIO" designation are for information only. The following shall be submitted in accordance with Section 01330 SUBMITTAL DESCRIPTIONS:

SD-07 Schedules

Delivery Schedule; FIO

Delivery Schedule, before work is started, at least 10 days prior to the intended date of the first delivery.

SD-13 Certificates

Soil Amendments;FIO.

Plants;FIO.

Certificates of compliance certifying that materials meet the requirements specified, prior to the delivery of materials. Reports for the following materials shall be included.

- a. Topsoil: Not Applicable.
- b. Fertilizer: For chemical analysis and composition percent.
- c. Agricultural Limestone: (Not Applicable)

d. Peat: (Not Applicable)

e. Plant Materials: For botanical and common name, size, quantity by species, grade, nursery grown.

f. Pesticide Material: For EPA registration number and registered uses.

1.3 SOURCE INSPECTIONS

1.3.1 Plant Materials

Plant materials shall be subject to inspection at the growing site by the Contracting Officer.

1.4 SHIPMENT, DELIVERY, INSPECTION, STORAGE, AND HANDLING

1.4.1 Shipment

1.4.1.1 Preparation

Preparation for shipment shall be done in a manner that will not cause shock or damage to branches, trunk, or root systems. Container grown plant sizes shall be provided as recommended by ANSI Z60.1. Plants shall be grown in a container sufficiently long for new fibrous roots to have developed and for root mass to retain its shape and hold together when removed from container. Container shall be sufficiently rigid to hold ball shape and protect root mass during shipping.

1.4.1.2 Antidesiccant Application

Plants shall be sprayed with an antidesiccant as leaf budding occurs or when plant material has soft growth.

1.4.2 Delivery

1.4.2.1 Identification

Plants shall be identified with durable waterproof labels and weather-resistant ink. Plants shall have attached labels stating the correct plant name and size.

1.4.2.2 Protection During Delivery

Plants shall be protected during delivery to prevent desiccation of the plant or damage to the roots or balls. Branches of plants shall be protected by tying-in the branches and covering all exposed branches.

1.4.2.3 Soil Amendments

Soil amendments shall be delivered to the site in the original, unopened containers bearing the manufacturer's chemical analysis. In lieu of containers, soil amendments may be furnished in bulk. A chemical analysis shall be provided for bulk deliveries.

1.4.2.4 Pesticide

Pesticide materials shall be delivered to the site in the original unopened containers bearing legible labels indicating the Environmental Protection Agency (EPA) registration numbers and the registered uses.

1.4.3 Inspection

Plant material shall be inspected upon arrival at the job site by the Contracting Officer for conformity to the paragraph PLANTS and paragraph Shipment, and any unacceptable plant material shall be removed from the job site.

1.4.4 Storage

1.4.4.1 Plant Storage

Plants not installed on the day of arrival at the site shall be stored and protected in areas designated by the Contracting Officer. Plants shall be protected from exposure to wind and shaded from the sun. Covering that will allow air to circulate and prevent internal heat from building up shall be provided. All plants shall be kept in a moist condition by watering with a fine mist spray until planted.

1.4.4.2 Storage of Other Materials

Soil amendments shall be stored in dry locations away from contaminants. Pesticide materials shall not be stored with other landscape materials. Storage of materials shall be in areas designated or as approved by the Contracting Officer.

1.4.5 Handling

Care shall be taken to avoid injury to plants. Materials shall not be dropped from vehicles. Container-grown plants shall be handled by the container. Plants shall not be handled by the trunk or stems.

1.4.5.1 Time Limitation

Mulch: Limitation of time between installing plant and placing mulch is 48 hours.

1.5 WARRANTY

Furnished plants shall be guaranteed to be in a vigorous growing condition for a period of 12 months regardless of the contract time period. A plant shall be replaced one time under this guarantee. A written calendar time period for the guarantee of plant growth shall be furnished to the Contracting Officer.

PART 2 PRODUCTS

2.1 PLANTS

2.1.1 Varieties

Plants shall be nursery grown or plantation grown stock conforming to ANSI Z60.1 and shall be of the following specified varieties:

| <u>Botanical Name</u> | <u>Common Name</u> | <u>Size</u> |
|---------------------------|----------------------|-------------|
| Acer negundo californicum | California Box Elder | 5 gal. |
| Platanus racemosa | California Sycamore | 5 gal. |
| Quercus lobata | Valley Oak | 5 gal. |

Quercus wislizenii Interior Live Oak 5 gal.

2.1.2 Substitutions

Substitutions will not be permitted without written request from the Contractor for approval by the Contracting Officer.

2.1.3 Growing Conditions

All plants shall be grown under climatic conditions similar to those in the locality of the project or acclimatized for a period of 6 months prior to installation.

2.1.4 Quality

Well shaped, well grown, vigorous, healthy plants having healthy and well branched root systems shall be provided. Plants shall be provided free from disease, harmful insects and insect eggs, sun-scald injury, disfigurement and abrasion. Plants shall be provided that are typical of the species or variety and conforming to standards as set forth in ANSI Z60.1 and as specified herein.

Shade and Flowering Trees

A height relationship to caliper shall be provided as recommended by ANSI Z60.1. Height of branching should bear a relationship to the size and variety of tree specified and with the crown in good balance with the trunk. Trees shall not be "poled" or the leader removed.

- a. Single stem: Trunk shall be reasonably straight and symmetrical with crown and have a persistent main leader.
- b. Specimen: A plant shall be provided that is well branched and pruned naturally according to the species. The form of growth desired, which may not be in accordance with natural growth habit, shall be as indicated.

2.1.5 Size

Plants shall be furnished in sizes indicated. Plants larger in size than specified may be provided at no additional cost to the Government.

2.1.6 Measurement

Plant measurements shall be in accordance with ANSI Z60.1.

2.2 TOPSOIL

No topsoil is required for the project site.

2.2.1 Soil Test

A soil test shall be performed for Ph, particle size, chemical analysis and mechanical analysis to establish the quantities and type of soil amendments required to meet local growing conditions for the type and variety of plants specified.

2.3 SOIL AMENDMENTS

Soil amendments consist of lime, fertilizer, bonemeal, organic soil amendments and soil conditioner.

2.3.1 Lime

Lime shall be agricultural limestone and shall have a minimum calcium carbonate equivalent of 90 percent and shall be ground to such a fineness that at least 90 percent will pass a 10-mesh sieve and at least 50 percent will pass a 60-mesh sieve.

2.3.2 Dry Fertilizer

Dry fertilizer shall be commercial grade, free flowing, uniform in composition and conforming to FS 0-F-241. Fertilizer shall be controlled-release fertilizer consisting of nitrogen-phosphorous-potassium ratio: 20 percent nitrogen, 10 percent phosphorous, and 5 percent potassium. Controlled-release fertilizer shall be in tablet form.

2.3.3 Bonemeal

Bonemeal shall be a finely ground, steamed bone product containing from 2 to 4 percent nitrogen and 16 to 40 percent phosphoric acid.

2.3.4 Soil Amendments

2.3.4.1 Peat (Not Applicable)

2.3.4.2 Sand

Sand shall be clean and free of toxic materials and at least 95 percent by weight shall pass a 10-mesh sieve, and 10 percent by weight shall pass a 16-mesh sieve.

2.3.4.3 Rotted Manure

Rotted manure shall be unleached stable or cattle manure containing not more than 25 percent by volume of straw, sawdust, or other bedding materials and containing no chemicals or ingredients harmful to plants. The manure shall be heat treated to kill weed seeds and be free of stones, sticks, and soil.

2.3.4.4 Decomposed Wood Derivatives

Decomposed wood derivatives shall be ground bark, sawdust, or other wood waste material free of stones, sticks, and toxic substances harmful to plants and stabilized with nitrogen and having the following properties:

| | |
|-------------------------|--|
| <u>Particle size</u> | <u>Minimum percent by weight passing</u> |
| No. 4 mesh screen | 95 |
| No. 8 mesh screen | 80 |
| | |
| <u>Nitrogen Content</u> | <u>Minimum percent based on dry weight</u> |
| Redwood Sawdust | 0.5 |
| Fir Sawdust | 0.7 |

Nitrogen Content
Fir or Pine Bark

Minimum percent based
on dry weight
1.0

2.3.5 Soil Conditioner

For single use or in combination to meet requirements for planting backfill.

2.3.5.1 Gypsum

Gypsum shall be commercially packaged, free flowing, and a minimum of 95 percent calcium sulfate by volume.

2.3.5.2 Aluminum Sulfate

Aluminum sulfate shall be commercial grade.

2.4 MULCH

Mulch shall be of an inert mulch material and free from weeds, debris, and other deleterious materials.

2.5 STAKING MATERIAL

2.5.1 Bracing Stakes

Bracing stakes for tree support shall be pentachlorophenol treated lodge pole pine free of any defects that would impair the strength. Bracing stakes shall be minimum 2" diameter by 8' long and pointed at one end.

2.5.2 Tree Ties

Material for holding tree to stake shall be a commercially available rubber tie.

2.6 WATER

Water shall not contain elements toxic to plant life. Water will be furnished from the project mainline or a Government fire hydrant on the base.

2.7 ANTIDESICCANT

Antidesiccant shall be an emulsion that will provide a film over plant surfaces permeable enough to permit transpiration, and shall not damage the plant.

2.8 PRE-EMERGENT HERBICIDE

Pre-emergent herbicide shall be in a commercially available dry or liquid form that is easily applied and meet all local and state regulations.

PART 3 EXECUTION

3.1 EXAMINATION

3.1.1 Verify Grades

The Contracting Officer shall verify the finished grades are as indicated

on drawings, and smooth grading has been completed in accordance with Section 02210 GRADING before start of landscape operations.

3.1.2 Underground Obstructions to Planting

The location of underground utilities and facilities shall be verified. Damage to underground utilities and facilities shall be repaired at the Contractor's expense.

3.2 SITE PREPARATION

3.2.1 Layout

Plant material locations, and mulch outlines shall be staked on the project site before any excavation is made. Plant material and mulch locations may be adjusted by the Contracting Officer to meet field conditions.

3.3 EXCAVATION

3.3.1 Obstructions Below Ground or Poor Drainage

When obstructions below ground or poor drainage affect the contract operation, proposed adjustments to landscape element locations, type of plant and planting method or drainage correction shall be submitted to and approved by the Contracting Officer. If caliche soil is encountered, a 6-inch chimney drain, 2 - 3 feet deep will be made in the planting hole. Refer to the Tree Staking and Planting Detail.

3.3.2 Plant Pits

Plant pits shall be dug to produce vertical sides and flat, uncompacted bottoms. When pits are dug with an auger and the sides of the pits become glazed, the glazed surface shall be scarified. The size of all plant pits, shall be 1-1/2 times rootball depth and a minimum of 4 times rootball depth.

3.3.3 Rough Grading and Landscape Berms

All grades and landscape berms shall follow the designed slope and swales for drainage.

3.4 PERCOLATION TEST

Test for percolation shall be done to determine positive drainage of plant pits and beds. The Contracting Officer shall be notified in writing of all soil and drainage conditions detrimental to growth of plant material and shall submit proposal for correcting the condition.

3.5 PLANTING TIMES AND CONDITIONS

For best results, install container grown plant material in the fall before the chance of the first frost or in the spring after the last chance of frost. Planting operations shall be performed only during periods when beneficial results can be obtained. When drought, excessive moisture or other unsatisfactory conditions prevail, the work shall be stopped when directed. Contractor shall schedule planting in the mornings to avoid stressing plants during installation, if the planting schedule calls for installation when the temperature is expected to be 90 degrees Fahrenheit or greater. When special conditions warrant a variance to the planting operations, proposed planting times shall be submitted to and approved by

the Contracting Officer.

3.6 INSTALLATION

3.6.1 Backfill Mixtures

Backfill shall be installed as part of the installation operations. The backfill mixture shall be a proportioned mixture thoroughly mixed by volume of clean native soil and selected organic soil amendment(s) of a decomposed wood derivative nature.

3.6.1.1 Backfill Soil Mix

The basin backfill soil mixture shall be placed in the planting pits during plant installation operations. The basin backfill soil mixture shall be as follows:

| | | |
|---------------------------|---|--------------------|
| Clean Native Soil | = | 1 part to mixture |
| Organic Soil Amendment(s) | = | 2 parts to mixture |

3.6.2 Setting Plants

Plants shall be set plumb and held in position until sufficient backfill soil mix has been firmly placed around roots or ball. Plants shall be set in relation to surrounding grade so that they are even with the depth at which they were grown in the nursery, or container. Plants root crown shall be set above subgrade as specified on detail.

3.6.3 Rain Basins

A depressed rain basin shall be formed around individual plants. Basin shall be excavated from around planting, and shall be level and continuous around plant.

3.6.4 Dry Fertilizer

Dry fertilizer shall be placed in tablet form in the plant pit in the immediate vicinity of the feeding roots in accordance with the manufacturer's recommendations. Space tablets at equal distances from each other and the rootball. The tablets shall be allotted as follows:

| | | |
|----------------------------|---|---|
| 24" box container plants | = | 6 tablets (21 grams each or equivalent) |
| 15 gallon container plants | = | 4 tablets (21 grams each or equivalent) |
| 5 gallon container plants | = | 3 tablets (21 grams each or equivalent) |
| 1 gallon container plants | = | 1 tablets (21 grams each or equivalent) |

3.6.5 Container-Grown Plants

Non-biodegradable containers shall be removed without damage to the plant or root system. Biodegradable containers shall be split. The backfill mix shall be completed, tamped and watered.

3.6.6 Staking

All trees shall be held in place with two bracing stakes driven vertically into ground and placed on opposite sides. Stakes shall not injure the ball or roots. The tree shall be held firmly between the stakes with a double strand of rubber tie. Nursery stakes shall be untied and removed from stem, if applicable. Care shall be taken so that the stem is supported

during this operation and is not allowed to bend to the point of damage before the tree stakes are in place and the tree is secured.

3.7 FINISHING

3.7.1 Pruning

The total amount of foliage shall be pruned by one-fourth to one-third on installed trees and shrubs to compensate for loss of roots and transplanting shock. The typical growth habit of individual plants shall be retained. Clean cuts shall be made flush with the parent trunk. Improper cuts, stubs, dead and broken branches shall be removed. "Headback" cuts at right angles to the line of growth shall not be permitted. Trees shall not be poled or the leader removed, nor shall the leader be pruned or "topped off." Cuts or wounds measuring a minimum 1/2 inch in diameter shall be painted with the specified tree wound dressing.

3.7.2 Mulch

After rough grading, mulch bed outlines shall be marked on the ground as per drawings and field conditions for approval by the Contracting Officer prior to installation of any mulch. Pre-emergent herbicide shall be applied before placement of any mulch. Mulch should be applied to a depth of 2 inches.

3.7.3 Water

Plants shall be watered as necessary to maintain an adequate supply of moisture within the root zone. Run-off, puddling and wilting shall be prevented.

3.7.4 Antidesiccant Application

Plants requiring further protection shall be sprayed with anti-desiccant in accordance with manufacturer's recommendations.

3.8 MAINTENANCE DURING PLANTING OPERATION

Installed plants shall be maintained in a healthy growing condition. Maintenance operations shall begin immediately after each plant is installed and shall continue until the plant establishment period commences. The maintenance includes watering, pruning, wound dressing, straightening and other necessary operations. Plant beds and earth water basins shall be kept free of weeds, grass and other undesired vegetation. Plants shall be checked for settlement and shall be reset proper grade as necessary. Run-off, puddling and wilting shall be prevented.

3.9 APPLICATION OF PESTICIDE MATERIAL

When pesticide becomes necessary to remove a disease or pest, a state-certified applicator shall apply required pesticide in accordance with State EPA label restrictions and recommendations. Hydraulic equipment shall be provided for the liquid application of pesticides with a leak-proof tank, positive agitation methods, controlled application pressure and metering gauges. A pesticide treatment plan shall be provided to the Contracting Officer as specified in paragraph SUBMITTALS.

3.10 RESTORATION AND CLEAN UP

3.10.1 Restoration

Pavements, slopes, and facilities that have been damaged from the planting operation shall be restored to original condition at the Contractor's expense.

3.10.2 Clean Up

Excess and waste material from the planting operation shall be removed and disposed of off the site. Adjacent paved areas shall be cleared.

3.10.3 Replacement Plants

Plants shall be provided for replacement in accordance with paragraph PLANTS. Replacement plants shall be installed in accordance with paragraph INSTALLATION. No extended plant establishment period shall be required for replacement plants. A plant will be replaced in accordance with paragraph WARRANTY.

3.11 FINAL ACCEPTANCE

3.11.1 Preliminary Inspection

Prior to the end of the maintenance period, a preliminary inspection shall be held by the Contracting Officer. Time for the inspection shall be established in writing. A checklist of items to be done will be determined, plants to be replaced, mulch replacement, etc. These items will be checked for completion at the Final Inspection.

3.11.2 Final Inspection

At the end of the maintenance period, a final inspection shall be held by the Contracting Officer to determine that deficiencies noted in the preliminary inspection have been corrected. Time for the inspection shall be established in writing. Acceptance of the planting is subject to the guarantee of plant vigor and growth.

-- End of Section --