

**SUB WATER DEPARTMENT
STANDARD CONSTRUCTION SPECIFICATIONS
TABLE OF CONTENTS**

**SECTION 32 90 00
PLANTING**

PART 1	GENERAL	3
1.1	Description	3
1.2	Qualifications	3
1.3	Referenced Standards	3
1.4	Herbicides Application Qualification.....	3
1.5	Initial Inspection of Material	3
1.6	Submittals	4
1.7	Product Delivery, Storage and Handling.....	4
1.8	Planting Season and Job conditions	4
1.9	Plant Materials Substitution	4
1.10	Guarantee.....	5
PART 2	MATERIALS	5
2.1	Plants	5
2.2	Grass Seed and Sod	5
2.4	Street Trees.....	6
2.6	Soil Conditioners	7
2.7	Fertilizers and Chemicals	8
2.8	Mulch Material	8
2.9	Barriers and Drainage.....	9
2.10	Tree Staking and Tying Materials	9
2.11	Water	9
2.12	Product Substitutions.....	10
PART 3	EXECUTION	11
3.1	Plant Layout, Scheduling and Inspection	11
3.2	Time of Planting	11

3.3	Delivery	11
3.4	Lawn and Grass Planting.....	12
A.	Preparation of Subgrade	12
B.	Subsurface Drainage	12
C.	Topsoil and Finish Grading.....	13
D.	Soil Sterilant.....	13
E.	Seeding	13
F.	Sodding	13
G.	Mulching and Protection	14
H.	Lawn Guarantee	14
3.5	Trees, Shrubs and Groundcover	15
A.	Planting	15
B.	Soil Conditioning	15
C.	Excavation for planting	16
D.	Tree Ball Placement	16
E.	Cutting.....	16
F.	Starter Solution.....	17
G.	Placement and compaction.....	17
H.	Watering.....	17
3.6	Shrubs and Groundcover Planting Bed Grades.....	17
3.7	Mulching	17
3.8	Staking Trees.....	17
3.9	Anti desiccant	17
3.10	Pruning	18
3.11	Cleanup.....	18
3.12	Protection of Existing Conditions	18

PART 1 GENERAL

1.1 Description

This section covers the work necessary for: (1) finish grading, addition of topsoil, fertilizer and weed control, establishment of lawns or grass areas by sod or seeding, and maintenance of lawn or grass areas, complete; (2) mulching, fertilizing, and planting of ground cover, establishment of nursery stock, such as trees, shrubs, and small plants, and maintenance of ground cover and nursery stock, complete; (3) subsurface drainage; (4) repair of existing underground sprinklers, complete.

1.2 Qualifications

Landscaper must be licensed under ORS 671.510 - 671.710. Landscaping prime contractor or subcontractor must have at least two (2) years prior landscaping experience of similar scope. Only qualified Contractors are invited to submit bid proposals. Submit names and addresses of previous projects, owners, and locations if requested by the Engineer.

1.3 Referenced Standards

- A. The following issues, but referred to hereafter by basic designation only, form a part of this specification to the extent indicated by references thereto:
1. American Standard For Nursery Stock, 1973, published by American Association of Nurseryman, Inc.
 2. Standardized Plant Names, 1942 Edition, published by J. Horace McFarland Company.
 3. Federal Standard for Fertilizers - Mixed, Commercial: FS0-F-241D

1.4 Herbicides Application Qualification

Application of herbicides for weed control as may be required shall be made only by an applicator currently licensed under state law.

1.5 Initial Inspection of Material

All plant materials will be inspected by the Engineer before being planted and all plant materials not meeting specification requirements shall be rejected.

1.6 Submittals

- A. Submit certifications or samples of material requested for substitution. Substitutions shall not be allowed without prior written approval of the Engineer.
- B. Submit, within six weeks prior to use, a list of all plant materials indicating source of supply, order invoice, size and quantity for each specie or variety.
- C. Inspection certificates:
 - 1. All plant material shall meet requirements of State and Federal laws with respect to inspection for plant diseases and infestation.
 - 2. Inspection certificates required by law shall accompany each shipment of plant materials and be submitted to the Engineer.

1.7 Product Delivery, Storage and Handling

- A. Protect plant materials, at all times, during handling, shipping, and storage, from extreme weather conditions, wind, drying of roots or root ball injury.
- B. Plant materials showing damage from handling, shipping, or during planting shall be rejected by the Engineer and shall be replaced by the Contractor at no expense to the Owner.
- C. Store fertilizers in a dry place and protect from intrusion of moisture.

1.8 Planting Season and Job conditions

- A. Plant coniferous and deciduous trees, shrubs and ground cover during periods which are normal for work as determined by the season, weather conditions, and horticultural practice. Do not plant when there is prolonged freezing weather or when the soil is in a wet or muddy condition.
- B. Coordinate planting work with soil preparation.
- C. Verify that any specified irrigation system is installed and completely operable prior to commencement of work in this section.

1.9 Plant Materials Substitution

- A. Plants, not specifically named in the plant list, will not be accepted unless specifically accepted in writing by the Engineer.

- B. Substitutes proposed for approval, in each case shall possess the same essential characteristics as the kind of plant actually specified in regard to appearance, ultimate height, shape, habit of growth, general soil and other requirements.

1.10 Guarantee

- A. The guarantee of ornamental plant materials furnished and planted under this contract shall be for one full year from the date of Written Approval as specified herein. The term of the guarantee shall commence only after the date of written approval. Obtain written approval from the Engineer after all planting beds are completely installed and all lawn areas have been mowed at least twice.
- B. At the end of the guarantee period, the Owner's Representative will make an inspection to determine the condition of plants. All plants not in a healthy growing condition, as determined by the Owner's Representative, will be noted and as soon as seasonal conditions permit, shall be removed from the site and replaced with plants of the same species and size as originally specified. Such replacement shall be made in the same manner as specified for the original plantings, and at no extra cost to the Owner. The guarantee on plants shall be limited to one full replacement cycle.

PART 2 MATERIALS

2.1 Plants

Names of plants shall conform to standardized names of the American Joint Committee on Horticultural Nomenclature. Names of varieties not included therein shall conform to names generally accepted in the nursery trade. The Contractor shall provide plants which are nursery-grown with growth habit that is normal for the species, sound, healthy, vigorous, and free from insects, diseases, and injuries and equal to or exceeding measurements specified. The Contractor shall provide sizes according to the current issue of American National Standard Institute (ANSI) 260.1-1973, American Standard for Nursery Stock.

2.2 Grass Seed and Sod

- A. Grass seed mixtures shall be selected to match existing adjoining lawns whenever possible. Drought tolerant grass seed mixtures for planting in park strips or in other areas not previously seeded shall be composed of the following:
 - Kentucky Blue Grass 0% – 10%
 - Perennial Rye .70% – 50%
 - Fine Fescue .30% - 40%

- B. All seeds shall be of blue tag stock and from the current or latest season's crop. The seed shall be in containers labeled in accordance with Oregon State and U.S. Department of Agriculture Rules and Regulations under the Federal Seed Act.
- C. A label showing seed variety, 95 percentage of purity by weight, 90 percent germination rate, maximum weed content, date of test within 9 months of date of delivery, and set forth in the General Certification Standard by the Oregon State University Certification Board shall be provided. Mold or evidence of container having been wet or otherwise damaged will be cause for rejection of each seed lot.
- D. When sod is specified or shown, the Contractor shall provide drought tolerant grass sod from a certified or approved source, strongly rooted and free of pernicious weeds. Sod shall be not less than 10 months old.

2.4 Street Trees

- A. Only those trees of a species approved by the City of Springfield shall be planted in the public right-of-way. Article 32, Section 32.050 STREET TREES, of the Springfield Development Code prohibits and makes it unlawful to plant the following trees:

Poplar Cottonwood	Ailanthus	
Willow	Elm	Locust
Fruit-bearing Trees	Nut trees	Conifer Trees

- B. Trees approved for planting shall be selected from a City approved source and shall be free from blight or other diseases. The tree(s) shall be nursery grown showing good growth equal to or exceeding the specified measurements, as specified in ANSI 260.1-1973, American Standard for Nursery Stock. The following is an example list of approved trees in the public right-of-way:

Scientific Name	Common Name
Acer saccharum 'Green Mountain'	Green Mountain Sugar Maple
Nyssa sylvatica	Black Gum, or Tupelo
Tilia cordata	Little-Leaf Linden
Cornus florida rubra	Red Flowering Dogwood
Cornus florida fastigiata	Upright Flowering Dogwood
Gleditsia triacanthos 'Sunburst'	Sunburst Honey Locust
Gleditsia triacanthos inermis	Thornless Honey Locust
Gleditsia triacanthos 'Rubylace'	Rubylace Honey Locust
Acer rubrum 'Scanlans'	Scanlans Red Maple
Liquidamber 'Styracifula'	Sweet Gum

- C. Only trees with a minimum trunk caliper of 2 inches, as measured 6 inches above the root collar, shall be selected for planting in the public right-of-way.

2.5 Imported Topsoil

Where imported topsoil is specified in the Contract Documents, Contractor shall provide natural, fertile, friable topsoil, representative of local productive soil, and 90 percent free of clay lumps or other foreign matter larger than 2 inches diameter, not frozen or muddy, with PH 5.0 to 7.0, not less than 3 percent humus as determined by loss on ignition of moisture-free samples dried at 100 degrees C. Gravel portion (particles larger than 2 mm) shall not exceed 15 percent of total volume. Imported topsoil shall be free of quack grass, horsetail and other noxious vegetation and seeds. Should such regenerative material be present in the soil, resultant growth, both surface and root, shall be removed by the Contractor within one (1) year of acceptance of the work at no expense to the Owner.

2.6 Soil Conditioners

- A. Peat: The Contractor shall use a peat consisting of natural residue formed by decomposition of reeds, sedges, or mosses from freshwater site, free from lumps, roots, and stones, absorbing at least 4 times its dry weight of water, organic matter not less than 90 percent on a dry weight basis, and maximum moisture content at time of delivery of 65 percent by weight.
- B. Lime: The Contractor shall provide a lime composed of ground dolomitic limestone not less than 85 percent total carbonates and magnesium, ground so that 50 percent passes 100 mesh sieve and 90 percent 20 mesh sieve. Coarser material will be acceptable provided the specified rates of application are increased proportionately on the basis of quantities passing 100 mesh sieve.

2.7 Fertilizers and Chemicals

- A. Commercial Fertilizer: A complete plant food containing 22% nitrogen, 16% phosphorous, 8% soluble potash, and a minimum 2% sulfur, conforming to applicable State fertilizer laws. Fertilizer shall be uniform in composition, dry, free-flowing, and delivered in original, unopened moisture-proof containers bearing manufacturer's guaranteed analysis.
- C. Plant Tablets: Plant tablets shall consist of compressed urea-formaldehyde containing added phosphorous and potassium to yield a 20:10:5 ratio of N-P-K plus 1.4 percent sulfur and be of the type approved by the City of Springfield.
- D. Anti desiccant: Anti desiccant shall be a transparent concentrate in liquid form capable of application by spraying and/or dipping to relieve transplanting shock, wilt and loss from drying winds. The anti desiccant shall be a clear film that will retard moisture loss without respiration and be provided for use on edible crops in the United States. The concentrate shall not crack, peel off the foliage, be damaged by freezing nor possess any ingredient that will cause solidification or be harmful to wildlife.
- E. The Contractor shall use products manufactured for use as an herbicide and as specified in the current issue of Pacific Northwest Weed Control Handbook.
- F. Ground and Storm Water Protection: Springfield has several wellhead protection areas. The Contractor shall be responsible for the safe handling and storage of chemicals and fertilizers and the prevention of groundwater and storm water run-off contamination. Refer to special Department of Agriculture, DEQ, and Oregon Health Division rules that may apply.

2.8 Mulch Material

- A. General: Material is to be free from noxious weed seed and all foreign material, chemicals and substances harmful to plant life.
- B. Organic mulch of clean ground fir or hemlock bark graded so that 50 percent consists of particles larger than one-fourth inch but not exceeding 1 inch.
- C. Straw mulch of threshed straw of oats, wheat, or rye free from seeds of obnoxious weeds or salt hay.
- D. Fiber mulch of heavy, twisted jute mesh, or equal, weighing one pound per square yard, with openings between strands approximately 1-inch square.
- E. Sawdust and wood shavings will not be acceptable.

2.9 Barriers and Drainage

- A. Root Barriers: Root retaining barriers shall be of a type equal to or better than that shown in the City of Springfield Standard Construction Specifications, "Standard Drawing No. 2-2, Street Tree Installation". The root control barriers shall be Filon (fabric) or equal, and shall be installed on the sidewalk-side and/or curbside of the roots.
- B. Subdrains: Subdrains shall conform to requirements for under drains in the City of Springfield Standard Construction Specifications, "DIVISION IV - SEWERS". Perforated PVC drain pipe, 3 to 4 inch diameter, shall be used. A separator of approved one pound density super fine fiberglass shall be used.

2.10 Tree Staking and Tying Materials

- A. General: Tree staking shall be as shown or as required using the materials specified herein.
- B. Eye-bolt masonry anchors of galvanized steel, with approved lead shield or flush shell for setting into masonry joint or concrete.
- C. Sound wood stakes, 2 inch by 2 inch by 96 inch, consisting of clear straight cedar, fir of construction grade or better, or approved equal, capable of lasting at least two (2) years ground burial.
- D. Wire for guys or for fastening trees to stakes, of 12 gauge, pliable galvanized steel.
- E. Hose for guy wire encasement, of two-ply reinforced rubber garden hose, minimum 1/2 inch diameter new or used.
- F. Turnbuckles, zinc-coated, with a 62 inch lengthwise opening, 3/8 inch diameter threaded openings fitted with screw eyes.
- G. Wrapping material of first quality burlap, minimum 8 ounce weight, 6 inches to 10 inches in width.
- H. Plastic chain-type tie down for trees, 1 inch wide by 1/8 inch thick, or approved equal.

2.11 Water

- A. Water shall be suitable for irrigation, free from oil, acid, alkali, salt or other substances harmful to plant life.

- B. Access to water for plant installation shall be provided by the Owner. The Contractor shall file for a hydrant permit and provide an Owner approved backflow assembly. If a hydrant isn't located within the construction area, then the Contractor shall provide a water truck as means to transport water to the jobsite.
- J. Trees: Provide untapped, straight, single-leader trees.
- K. Plant materials shall be free from disease, insects, disfiguring knots, sun scale, injuries, bark abrasion, evidence of improper pruning and other objectionable disfigurements.
- L. Trees and shrubs shall have all developed branching system; shrubs shall have full foliage and shall not be leggy.
- M. Thin, weak, leggy, or misshapen plants will be rejected by the Engineer.
- N. Labels: The correct horticultural name, size and caliper and/or other data, as specified in the Plant Material List, written on durable labels in weather-resistant ink, shall be securely attached to all individually shipped plants and to each box, bundle, bale and container of plant materials. Labels shall remain on representative plant materials until final acceptance of planting. Labels shall be affixed in such a manner that will not girdle the plant materials.
- O. The species (botanical and common names), size, manner in which the plants are furnished, and spacing of the required plant materials, are noted on the planting plan.
- P. The quantities of plant materials shall be as determined by the Contractor in accordance with the specified spacing, or location on plan. Surpluses or shortages of plant quantities shall be the responsibility of the Contractor.

2.12 Product Substitutions

In the event that a species of tree or plant becomes unavailable following the award of contract, the Contractor shall submit requests for product substitution of a similar type and same caliper tree size for approval to the Engineer, in writing, in accordance with these documents. The Contractor will be paid only the invoice price plus 15 percent in accordance with Payment for Force Account Work requirements specified elsewhere within these documents. For substitution approval, the Contractor shall provide the Engineer with three (3) quotes based on tree bid item only from nursery wholesale dealers to show that the lowest cost bid is being used.

PART 3 EXECUTION

3.1 Plant Layout, Scheduling and Inspection

- A. Layout of major planting areas as indicated on the plans are approximate only, and the locations and identity of all trees, shrubs and ground covers shall be outlined in the field by the Contractor, subject to review and approval by the Engineer.
- B. Within 20 calendar days of the date specified for commencement of work, the Contractor shall submit for approval a time schedule indicating dates for beginning and completion of the following operations:
 - 1. Delivery of topsoil and other material
 - 2. Tagging of plants in the nurseries
 - 3. Survey and staking of plant locations
 - 4. Digging and preparation of plant pits, grass seed and planting beds
 - 5. Planting of seed, shrubs, trees and ground cover
 - 6. Maintenance
- C. Inspection: The Contractor shall notify the Engineer forty-eight (48) hours prior to beginning any planting. The Engineer may adjust plant material location to meet field conditions. Planting shall not occur until the Engineer has approved the location and layout of all plant beds.
- D. If directed by the Engineer, a soil test shall be performed before the project schedule is submitted. The test may be performed by any Oregon State University County Extension Agent or by any other approved soils testing laboratory. The soils analysis shall provide a chemical analysis of the soil and recommendation for soil improvements for the crop to be utilized. The recommendations may be used to select the particular fertilizer and soil improvement chemicals to be used prior to planting when directed by the Engineer.

3.2 Time of Planting

- A. Conduct planting operations under favorable weather conditions during seasons which are normal for such work, generally during the periods of April 1 to June 1, and from September 15 to November 15. Planting operations outside these time periods may be conducted with approval of the Engineer.

3.3 Delivery

- A. Supply plants designated B&B (balled and burlapped) in the Plant List with firm, natural balls of earth, or diameter and depth sufficient to encompass the

fibrous and feeding root system necessary for vital plant growth. The rootball shall be firmly wrapped with burlap and bound with twine, cord or wire mesh. Manufactured rootballs or rootballs less than the diameter indicated for the caliper or size of plant material (American Standard for Nursery Stock) will be rejected.

- C. Furnish plants designated GC or “gallon container” in the Plant List with self-established root systems sufficient to hold earth together after removal from the container but not root-bound, in a container of specified size.
- D. Sod shall be delivered immediately on lifting and after lawn bed is prepared for planting. Sod shall be protected from drying by covering during delivery to protect from sun and wind. Materials shall be stored only in designated areas on the site.

3.4 Lawn and Grass Planting

A. Preparation of Subgrade

After rough grading is completed and before topsoil or loam is spread, the subgrade shall be loosened to a depth of 4 inches by roto-tilling. All rocks larger than 2 inches shall be removed, as well as any roots or other materials considered to be detrimental to the future growth of the completed lawn or planting.

Limits of all areas to be restored with grass seed or bark mulch shall be identified in the field by the Engineer or on the construction drawings. The Contractor's work areas beyond the identified limits of the project which are restored by the Contractor shall become the responsibility of the Contractor. Lawn restoration and bark mulch restoration shall be two separate items, unless specified in the Proposal as lawn restoration which may include bark mulch in the same item.

B. Subsurface Drainage

Perforated PVC pipe shall be laid on firm beds of gravel with minimum fall of 0.5 percent and located as detailed on drawings. Minimum depth shall be 24 inches and no deeper than required to produce minimum fall. Installation of subsurface drain pipes shall conform to the requirements of the City of Springfield Standard Construction Specifications, "Subsection 404.3.04, Perforated Pipe Under drains". Pipes shall be covered with filter fabric to prevent infiltrations of soil. Trenches shall be backfilled with gravel to within 4 inches of subgrade.

The Contractor shall place other drain materials in conformance with the applicable requirements in the City of Springfield Standard Construction Specifications, "Subsection 404.3.04, Perforated Pipe Under Drains". Backfilling of trenches shall be completed with a 4 inch layer of coarse sand and tamped for compaction, as approved.

C. Topsoil and Finish Grading

Topsoil and soil conditioner shall be spread over the prepared rough grade using a rubber-tired tractor with grader blade or equivalent, weighing maximum of 32 tons; the applied materials shall be thoroughly mixed to a depth of 8 inches with a disc or cultivator over the entire area in two directions at right angles.

The Contractor shall rake topsoiled area to a uniform grade so that all areas drain, as shown or as approved. Topsoil shall be free of all trash and stones exceeding 2 inches in diameter which shall be removed from the area to a depth of 2 inches prior to preparation and planting grass.

D. Soil Sterilant

When required, the Contractor shall thoroughly water area to be treated with soil sterilant one day prior to application or as specified by manufacturer. Area shall be thoroughly watered after application and soil kept moist to a depth of 1 inch for three weeks. Three weeks after soil sterilant application, the area shall be raked immediately before seeding or sodding.

E. Seeding

Grass seed shall be planted only at times when local weather and other conditions are favorable to the preparation of the soil and to the germination and growth of grass seed. Grassed areas shall be sown evenly with a mechanical spreader at a rate of one pound per 150 square feet, rolled, covered to one-fourth inch with approved mulch, and watered with fine spray. The method of seeding may be varied, such as hydro-seeding or as approved, however, responsibility to establish a smooth, uniformly grassed area will not be waived.

F. Sodding

Before the sod is laid, soft spots and irregularities in grade of prepared bed shall be corrected to the satisfaction of the Engineer. Topsoil shall be brushed or raked with no lumps or stones larger than 3/4 inch over the area to be sodded. Sod shall be laid so that no voids occur. Sod shall be tamped and rolled. Sod shall be watered thoroughly. Sodded surface shall be completed

true to finished grade, even and firm. On slope steeper than two horizontal to one vertical, sod shall be fastened with pins 6 inches long driven through sod into soil flush with top of sod.

G. Mulching and Protection

All areas with a slope greater than 5 percent shall be mulched by spreading a uniform light cover of straw mulch over the seeded area at a rate of 0.62 pounds per square yard.

All areas with a slope greater than 20 percent shall be mulched by placing fiber mulch in strips paralleling the slope to completely cover newly seeded areas. Mulch shall be pinned to ground with 4 inch long wire staples at 5 foot intervals immediately after seeding.

All areas with a slope steeper than 25 percent shall be mulched with spray mulch applied at a rate of 15 gallons per 1000 square feet after wetting the ground to a depth of at least 1 inch.

The Contractor shall protect new seeded area from pedestrians and bikes. Unless otherwise approved, a fence of 2 inch posts 4 feet high spaced 10 feet on center shall be erected and strung with jute, hemp, or a single strand of No. 12 gauge wire marked with flags at 3 foot intervals between posts.

In lieu of spreading grass seed and mulch, commonly known as a "Lawn Restoration" in the Proposal, the Contractor may be directed to place bark mulch in areas that would normally be restored with vegetation. Bark shall be spread evenly to a depth not less than 3 inches, placed on topsoil or original ground which has been scalped or prepared to an even grade. Measurement and payment of bark mulch restoration shall be per square yard of mulching placed at the same rate of payment as lawn restoration unless a separate bark mulch restoration item is shown in the Proposal.

H. Lawn Guarantee

If at the end of an eight-week period, a satisfactory stand of grass has not been produced, the Contractor shall immediately renovate and reseed the unsatisfactory portions of lawn, or when approved, reseed at the beginning of the next planting season. Lawn guarantee shall also include that a satisfactory stand of grass shall be free of weeds. If a satisfactory stand of grass develops by June 1st of the following year, the lawn will be accepted. If the lawn is not accepted, a complete replanting will be required during the ensuing planting season following the requirements specified.

A satisfactory stand is defined as a lawn or section of lawn that has:

1. No bare spots larger than 0.5 square foot.
2. Not more than 10 percent of total area with bare spots larger than 0.5 square foot.
3. No weeds.

3.5 Trees, Shrubs and Groundcover

A. Planting

Plant trees and shrubs upright and adjust to set best appearance or relationship to adjacent plants and structures. New planting shall be located where shown, except approved adjustments will be made where obstructions below ground are encountered or where changes have been made in the construction. No planting, except ground cover, shall be dug and soil mixture readied for planting before plants are delivered.

B. Soil Conditioning

After the specified chemical analysis report for topsoil is received, topsoil mixture will be prepared for plant pits and beds by thoroughly mixing approved topsoil with soil conditioner materials, fertilizer, and lime. The mixture shall be thoroughly mixed with rotary mixer or other approved method in the following portions:

PARTS BY VOLUME TOP SOIL CLASSIFICATION BY CLAY CONTENT	REQUIRED MIXTURES				
	TOP SOIL	SAND	PEAT	FERTILIZER*	LIME*
Clay 5-10 Percent	4	0	1	(2)LB/CY	(1)LB/CY
Clay 10-15 Percent	2	2	1	(2)LB/CY	(1)LB/CY
Clay 15-25 Percent	2	4	12	(2)LB/CY	(1)LB/CY

*Adjust in accordance with soil test chemical analysis report

The topsoil mixture and other materials shall be stored and protected at designated area of the site. Topsoil mixture shall be protected from excessive leaching by covering with tarpaulin if stored for more than six weeks.

C. Excavation for planting

1. Stockpile all excavated topsoil for planting operations.
2. In digging pits for trees, the Contractor shall separate sod, topsoil suitable for backfill, and subsoil, and shall dispose of the sod, rocks and unsuitable material off-site.
3. Plant pits shall have vertical sides and flat bottom. Minimum depth of plant pits for trees shall be 18 inches measured from finish grade. This depth shall be increased as necessary to accommodate the ball or roots, plus a minimum of 6 inches of hand-firmed topsoil below the root ball. The diameter or minimum width of planting pit or trenches shall be at least 1 foot greater than the diameter of the ball or container, as shown on the drawings.
4. If standing water is encountered during excavation of the planting pits, the Contractor shall notify the Engineer who will determine the corrective drainage measures required.
5. Planting beds which are to receive groundcover or similar plantings shall have all objectionable weeds or grasses removed and disposed of off-site.
6. If unremovable underground obstructions or rocks are encountered in excavation of planting areas, an alternate location for the planting shall be selected by the Engineer.
7. Disposal of excess soil: Excess excavated topsoil shall be used to form saucers around plants as detailed. Excess soil not required or suitable for the above usage shall be properly disposed of off the project site.

D. Tree Ball Placement

Hand-firm mound, place tree in tree pit and remove burlap from around, at least, upper one-third of earth ball. Pulling burlap from under ball will not be permitted on large or loose root balls.

E. Cutting

Cut off cleanly all broken or frayed roots, smaller than 1/2" caliper.

F. Starter Solution

Prior to backfilling, the upper two-thirds of the plant pit shall be flooded with the plant starter solution.

G. Placement and compaction

Place and compact backfill soil mixture carefully to avoid injury to roots; fill all voids.

H. Watering

When the hole is nearly filled with prepared backfill, completely flood the plant pit and allow the water to soak away. Fill holes to finish grade. Lightly compact soil around root ball.

3.6 Shrubs and Groundcover Planting Bed Grades

Establish finish grades and slopes in accordance with finish grades as specified.

3.7 Mulching

Mulch all shrubs and ground cover planting beds with a 2-inch layer of mulch material within two (2) days after planting. Cover entire bed areas; apply evenly. A 2-inch layer of mulch material shall be applied to saucer areas of trees and shrubs located outside of planting beds.

3.8 Staking Trees

A. Stake and tie trees immediately after planting as indicated on the detail drawings.

B. Drive stakes vertically into the ground as shown on the drawings. Do not injure root or ball.

3.9 Anti desiccant

The application of the anti desiccant shall be prior to transplanting as a spray or during planting as a dip. The anti desiccant shall not be applied if rain is anticipated in one hour or less. If not previously applied, the Contractor shall, within 24 hours of completing backfilling, spray all evergreen and leafed-out deciduous plants with the anti desiccant thoroughly covering all leaves. The solution shall be mixed according to manufacturer's specifications.

3.10 Pruning

Pruning shall be done at or after the time of planting in accordance with proper horticultural practice. Pruning shall be limited to the minimum necessary to remove injured twigs and branches and to compensate for the loss of roots during transplanting, but shall never exceed one-half of the branching structure. Crossed or rubbing branches shall be removed providing the natural shape of the tree is preserved. With the permission of the Engineer, pruning may be done before delivery of plants, but not before plants have been inspected and accepted. All cuts shall be made flush with the parent stem leaving no stubs. Pruning cuts shall be made in a manner to favor the earliest possible covering of the wound by callus growth. Cuts which produce large wounds and weaken the tree will not be acceptable. Evergreens shall not be pruned except to remove injured branches and/or double leaders. The use of pole shears and/or hedge shears for pruning deciduous and evergreen trees will not be permitted. All trimmings and other debris left over from the planting operations shall be collected and disposed of legally off the site.

3.11 Cleanup

- A. Keep premises free from accumulation of debris.
- B. At completion of each area of work, remove all debris, equipment and surplus materials at no cost to the Owner.

3.12 Protection of Existing Conditions

The Contractor shall preserve and protect all monuments, bench marks, or other survey markers. Prior to opening an excavation, effort shall be made to determine whether underground utilities, such as sewer, communication, water, fuel, electric lines, irrigation systems, etc., will be encountered, and if so, where such underground installations are located. Damage due to the Contractor's work to existing utilities, monuments, bench marks, or any other surface features shall be repaired at the Contractor's expense.

END OF SECTION