

SECTION 32 93 00 - PLANTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Preparation of soil for planting
2. Furnishing and installing trees, shrubs, lawn and groundcover
3. Staking and juying
4. Mulching
5. Maintenance
6. Clean-up
7. Guarantee

1.2 DEFINITIONS

- A. Backfill:** The earth used to replace or the act of replacing earth in an excavation.
- B. Finish Grade:** Elevation of finished surface of planting soil.
- C. Manufactured Topsoil:** Soil produced off-site by homogeneously blending mineral soils or sand with stabilized organic soil amendments to produce topsoil or planting soil.
- D. Planting Soil:** Native or imported topsoil, manufactured topsoil, or surface soil modified to become topsoil; mixed with soil amendments.
- E. Subgrade:** Surface or elevation of subsoil remaining after completing excavation, or top surface of a fill or backfill, before placing planting soil.
- F. Subsoil:** All soil beneath the topsoil layer of the soil profile, and typified by the lack of organic matter and soil organisms.

1.3 SUBMITTALS

- A. Product Data:** For each type of product indicated.
- B. Samples:**
1. Mulch: 1 pound bag
 2. Organic Soil Additive: 1 pound bag
 3. Guying material: 12 inch length
 4. Topsoil: 1 pound bag
- C. Product certificates.**

- D. Planting Schedule: Indicating anticipated planting dates for exterior plants.
- E. Test Reports for prepared soil
 - 1. Employ, at no additional cost to the Owner, a S-7 soil test with recommendations for fertilizer and amendments from Soiltest Farm Consultants, Moses Lake, WA (509) 765-1622 or approved equal.
 - 2. Submittal for Prepared Soil: Contractor to follow soil-testing lab's instructions for soil sample collection.
 - 3. Test soils after (not before) they are prepared as specified herein for planting areas.
 - 4. If soil is shown not to meet criteria for growth of healthy plantings, submit a program of additional amendments based on recommendations of the agricultural chemist.
 - 5. Contractor to schedule testing such that it does not interfere with construction schedule.
- F. Maintenance Instructions: Recommended procedures to be established by Owner for maintenance of exterior plants during a calendar year.

1.4 QUALITY ASSURANCE

- A. Landscape Contractor Qualifications: A firm experienced in comparable landscape work with equipment and personnel adequate to perform the work specified.
- B. Topsoil Analysis: Furnish soil analysis by a qualified soil-testing laboratory.
 - 1. Report suitability of topsoil for plant growth. State-recommended quantities of nitrogen, phosphorus, and potash nutrients and soil amendments to be added to produce satisfactory topsoil.
- C. Plant Material: Provide quality, size, genus, species, and variety of exterior plants indicated, complying with applicable requirements in ANSI Z60.1, "American Standard for Nursery Stock." Provide healthy, vigorous stock, grown in recognized nurseries in accordance with horticultural practice and free disease, insects, eggs, larvae and defects such as knots, sun-scald, injuries, abrasions or disfigurement.
- D. Preinstallation Conference: Conduct conference at Project site.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Do not prune trees and shrubs before delivery. Protect bark, branches, and root systems from sun scald, drying, sweating, whipping, and other handling and tying damage. Do not bend or bind-tie trees or shrubs in such a manner as to destroy their natural shape. Provide protective covering of exterior plants during delivery. Do not drop exterior plants during delivery and handling.
- B. Handle planting stock by root ball.
- C. Deliver exterior plants after preparations for planting have been completed and install immediately. If planting is delayed more than six hours after delivery, set exterior plants and trees in shade, protect from weather and mechanical damage, and keep roots moist.

1.6 WARRANTY

- A. Special Warranty: Installer's standard form in which Installer agrees to repair or replace plantings that fail in materials, workmanship, or growth within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Death and unsatisfactory growth, except for defects resulting from lack of adequate maintenance, neglect, abuse by Owner, or incidents that are beyond Contractor's control.
 - b. Structural failures including plantings falling or blowing over.
 - 2. Warranty Periods from Date of Substantial Completion:
 - a. Trees and Shrubs: One year.
 - b. Ground Cover and Lawns: Six months.

1.7 MAINTENANCE SERVICE

- A. Initial Maintenance Service: Provide full maintenance by skilled employees of landscape Installer. Maintain as required in Part 3. Begin maintenance immediately after each area is planted and continue until plantings are acceptably healthy and well established, but for not less than maintenance period below.
 - 1. Maintenance Period for Trees and Shrubs: Three months from date of planting completion.
 - 2. Maintenance Period for Ground Covers and Lawns: Three months from date of planting completion.

1.8 PLANT SELECTION AND INSPECTION

- A. Tagging Plant Material: Plants delivered shall have legible labels attached to each individual plant delivered as a unit or container containing one or more plants. Labels shall give the necessary detailed information as to horticultural name, size or other data required to identify as conforming to specifications.
- B. Inspection of Plant Material: Owner's Representative may inspect plant material at nursery or offsite holding area prior to arrival on site. Plant materials shall be inspected by Owner's Representative after arrival on site. Notify the Owner's Representative four business days prior to the proposed arrival of plant materials on site. Arrange for adequate manpower and equipment on site at the time of plant material inspection and installation to unload and handle material and provide a complete staked layout during inspection. Plants not meeting the requirements herein specified or matching approved representative photographs shall be immediately removed from the project and replaced by the Contractor at no additional cost to the Owner.

PART 2 - PRODUCTS

2.1 SOIL AMENDMENT MATERIAL

A. Organic Amendments

1. The organic amendment shall be pure composted plant waste, a well decomposed, humus-like material derived from the decomposition of grass clippings, leaves, branches, wood and other organic materials, as supplied by Cedar Grove, Inc. 1-877-764-5748, or approved equal. The mix shall be composted for a minimum of 1 year.
2. Composted plant waste shall consist of 98% by volume, of material derived from the aerobic decomposition of recycled plant waste. The composted plant waste shall be free of viable weed seeds and other plant propagules (except airborne weed species), and shall have moisture content that has no visible free water or dust produced when handling the material.
3. Composted plant waste shall meet the following physical criteria:
 - a. 100% shall pass through a 1-inch sieve
 - b. Shall have a pH range between 5.0 and 8.5
 - c. Shall not contain more than 2% foreign material (plastic, concrete, metal and the like) on a dry weight basis

- B. For Plantings: Osmocote 14-14-14 slow release pellets for non-ericaceous plant material, or approved equal.

2.2 TREE AND SHRUB MATERIAL

- A. General: Furnish nursery-grown trees and shrubs complying with ANSI Z60.1, with healthy root systems developed by transplanting or root pruning. Provide well-shaped, fully branched, healthy, vigorous stock free of disease, insects, eggs, larvae, and defects such as knots, sun scald, injuries, abrasions, and disfigurement.
- B. Root-Ball Depth: Furnish trees and shrubs with root balls measured from top of root ball, which shall begin at root flare according to ANSI Z60.1. Root flare shall be visible before planting.
- C. Provide balled and burlapped stock (B&B) with a compact natural ball of earth firmly wrapped and tied in burlap so that upon delivery the soil in the ball is still firm and compact about the small feeding roots. Root ball sizes shall be in accordance with standards specified in ASNS.
- D. Dimension plants in their natural position. Plants larger than specified may be used, without increasing the Work Order Price, if approved by the Owner's Representative. Large plants cut back to sizes specified will not be accepted if they compromise the natural form.

2.3 GROUND COVER PLANTS

- A. Ground Cover: Provide ground cover of species indicated, established and well rooted in pots or similar containers, and complying with ANSI Z60.1.

2.4 LAWN

- A. Seed: Seed shall be fresh, clean, new crop seed. Seed mixes shall be Washington or Oregon certified. All other crop shall be identified. The Contractor shall furnish to the Owner's Representative the dealer's guaranteed statement of the composition of the mixture and the percentage of purity and germination of each variety. Seed shall not contain in excess of 1% weed seed. Seed containing prohibited or restricted noxious weeds is not acceptable. The following noxious weeds are prohibited from any mix. Bindweed, Canada Thistle, quackgrass, sedge kind weed, horse nettle, wild garlic, Bermuda grass, cheat, wild onion, corn cockle, dodder, johnsongrass, perennial sweet Sudan grass, sorghum hybrids. Seed mixes shall be one of the following:
- B. Seeding of new lawn areas is acceptable between March 15th and October 15th. Sod will be required if the area must be restored outside this window. For UW Friday Harbor Laboratories Work Orders, sod will not be accepted.
 - 1. Sun: 3-way blend of improved perennial ryegrasses.
 - 2. Light Shade: blend of 80% perennial ryegrass and 20% fine fescues (chewings fescue and creeping fescue). All grasses to be improved varieties.
 - 3. Medium Shade and non-irrigated lawns: blend of 60% perennial ryegrass and 40% fine fescue. All grasses to be improved varieties.
 - 4. Dense Shade: blend of three (3) fine fescues and a shade tolerant bluegrass (Poa Supina).
- C. Hydroseed mulch shall be wood cellulose fiber from Alder, containing no growth or germination inhibiting substances, a soil-binding agent (tackifier) shall be used; mulch shall be dyed a suitable color to facilitate placement.
- D. Soil binding agent shall consist of non-toxic, biodegradable materials, which are environmentally safe such as plantago or guar-based products.

2.5 TOPSOIL

- A. Topsoil: ASTM D 5268, pH range of 5.5 to 7, a minimum of 4 percent organic material content; free of stones 1 inch or larger in any dimension and other extraneous materials harmful to plant growth.
 - 1. Topsoil Source: Reuse surface soil stockpiled on-site. Verify suitability of stockpiled surface soil to produce topsoil. Clean surface soil of roots, plants, sod, stones, clay lumps, and other extraneous materials harmful to plant growth.
 - a. Supplement with imported or manufactured topsoil from off-site sources when quantities are insufficient.
 - 2. Topsoil Source: Import topsoil or manufactured topsoil from off-site sources. Obtain topsoil displaced from naturally well-drained construction or mining sites where topsoil occurs at least 4 inches deep; do not obtain from agricultural land, bogs or marshes.

3. Topsoil Source: Amend existing in-place surface soil to produce topsoil. Verify suitability of surface soil to produce topsoil. Clean surface soil of roots, plants, sod, stones, clay lumps, and other extraneous materials harmful to plant growth.
 - a. Surface soil may be supplemented with imported or manufactured topsoil from off-site sources.

2.6 INORGANIC SOIL AMENDMENTS

- A. Lime: ASTM C 602, agricultural limestone containing a minimum of 80 percent calcium carbonate equivalent and as follows:
 1. Class: T, with a minimum of 99 percent passing through No. 8 sieve and a minimum of 75 percent passing through No. 60 sieve.
 2. Class: O, with a minimum of 95 percent passing through No. 8 sieve and a minimum of 55 percent passing through No. 60 sieve.
- B. Sulfur: Granular, biodegradable, containing a minimum of 90 percent sulfur, with a minimum of 99 percent passing through No. 6 sieve and a maximum of 10 percent passing through No. 40 sieve.
- C. Iron Sulfate: Granulated ferrous sulfate containing a minimum of 20 percent iron and 10 percent sulfur.
- D. Aluminum Sulfate: Commercial grade, unadulterated.
- E. Perlite: Horticultural perlite, soil amendment grade.
- F. Agricultural Gypsum: Finely ground, containing a minimum of 90 percent calcium sulfate.
- G. Sand: Clean, washed, natural or manufactured, free of toxic materials.

2.7 FERTILIZER

- A. Bonemeal: Commercial, raw or steamed, finely ground; a minimum of 1 percent nitrogen and 10 percent phosphoric acid.
- B. Superphosphate: Commercial, phosphate mixture, soluble; a minimum of 20 percent available phosphoric acid.
- C. Commercial Fertilizer: Commercial-grade complete fertilizer of neutral character, consisting of fast- and slow-release nitrogen, 50 percent derived from natural organic sources of urea formaldehyde, phosphorous, and potassium in the following composition:
 1. Composition: 1 lb/1000 sq. ft. of actual nitrogen, 4 percent phosphorous, and 2 percent potassium, by weight.
- D. Slow-Release Fertilizer: Granular or pelleted fertilizer consisting of 50 percent water-insoluble nitrogen, phosphorus, and potassium in the following composition:

1. Composition: 20 percent nitrogen, 10 percent phosphorous, and 10 percent potassium, by weight.

2.8 MULCHES

- A. Compost Mulch: Well-composted, stable, and weed-free organic matter, pH range of 5.5 to 8; moisture content 35 to 55 percent by weight; 100 percent passing through 1-inch sieve; soluble salt content of 2 to 5 decisiemens/m.
- B. Bark Mulch: fine fir or hemlock bark of uniform color for groundcover beds and tree and shrub saucers and/or beds, free from weed seed, sawdust, splinters, and not containing resin, tannin, wood fiber or other compounds detrimental to plant life. Bagged mulch shall have moisture content not in excess of 22%. Bulk mulch shall have a size range of ½"-1 ¼" with a maximum of 20% passing a ½" screen.

2.9 WEED-CONTROL BARRIERS

- A. Nonwoven Fabric: Polypropylene or polyester fabric, 3 oz./sq. yd. minimum.
- B. Composite Fabric: Woven, needle-punched polypropylene substrate bonded to a nonwoven polypropylene fabric, 4.8 oz./sq. yd..

2.10 STAKING AND GUYING MATERIALS

- A. Stakes: Plastic 100% recycled post-consumer plastic
- B. Ties: Recycled polypropylene
- C. Twine: 3-ply jute

PART 3 - EXECUTION

3.1 PLANTING BED ESTABLISHMENT

- A. Subgrade Preparation:
 1. Completely remove and dispose of structural backfill, gravel, quarry spalls, and other obstructions in the area to receive planting to a depth of 12 inches, including areas where native soils have been removed and replaced with structural materials adjacent to buildings and paved areas.
 2. Remove debris and rocks over 4 inches in size to a depth of at least 12 inches in all areas to receive planting.
 3. Shape subgrades to lines and grades indicated. After subgrade reached, exposed soils shall be scarified to a depth of at least 12 inches; moisture conditioned if necessary and then compacted to 85% maximum.

4. Finish subgrades will be reviewed by Owner's Representative for acceptance prior to placing topsoil.

B. Soils in Planting Areas:

1. Loosen and prepare subgrade soil as specified herein
2. In plant beds, provide 18 inches of topsoil. In lawn areas, provide 6 inches of topsoil.
3. Place first 3 inches of topsoil on subgrade and rototill into subgrade soil to a depth of 6 inches. Place second lift and rototill into top 6 inches of soil. Repeat until desired grade is reached.
4. In areas that are protected by vegetation protection fencing or are beneath the canopies of existing trees and shrubs, whichever area is greater, soil protection shall be made under the direction of the Owner's Representative. Loosen soil by hand using a shovel or fork. Loosen soil with care to avoid loosening or damaging the root systems of existing trees and shrubs. Spread a 2-inch layer of topsoil over soil. Incorporate topsoil into soil using a shovel or fork. Feather soil grades into adjacent grades outside existing tree and plant canopies.
5. The top 4 inches of soil in cultivated areas shall be free of stones, clods of earth larger than 1 inch in diameter and other deleterious matter which might be a hindrance to mixing of soil amendments, planting and maintenance.
6. Apply dolomitic lime to all lawn plantings to obtain a pH range of 6.0 to 6.5. Do not apply more than 60 lbs. Of lime per 1,000 sq. ft. at one time. Verify pH by test of each major planting area.
7. Roll or hand compact soil to achieve compaction of 85% of dry weight density.

C. FINISH GRADING

1. After natural settlement and light rolling, the complete work shall conform strictly to the lines, grades and elevations indicated. Elevations and landform configuration is critical to project design intent. Supply additional soil as needed to give the specified depths and grade under the Contract without additional cost to the Owner.

3.2 TREE AND SHRUB PLANTING

- A. Excavation of Pits and Trenches: Excavate circular pits with sides sloped inward. Trim base leaving center area raised slightly to support root ball and assist in drainage. Scarify sides and bottom of plant pit smeared or smoothed during excavation.
 1. Excavate approximately three times as wide as ball diameter.
 2. Excavate at least 12 inches wider than root spread and deep enough to accommodate vertical roots for bare-root stock.
- B. Before planting, fill tree pits with water to assure drainage. Owner's Representative will inspect and accept tree pits prior to planting.
- C. Before planting, inoculate balled and burlapped plants, container and bare root plants with mycorrhizae per manufacturer's recommendations.

- D. Before placing verify that root flare is visible at top of root ball according to ANSI Z60.1. Remove excess dirt at top of rootball if necessary.
- E. Placement of trees and shrubs: Set trees and shrubs plumb and in center of pit or trench with top of root ball 3 inches above adjacent finish grades.
 - 1. Balled and Burlapped: Remove burlap and wire baskets from tops of root balls and 2/3 from sides, but do not remove from under root balls. Remove pallets, wire and surplus binding from top and sides of ball. Cleanly cut off broken or frayed roots. Tease out existing roots on perimeter of root ball without disturbing structure of root ball. Cut girdling roots. Do not use planting stock if root ball is cracked or broken before or during planting operation.
 - 2. Fabric Bag Grown: Carefully remove root ball from fabric bag without damaging root ball or plant. Do not use planting stock if root ball is cracked or broken before or during planting operation.
 - 3. Place planting soil mix around root ball in layers, tamping to settle mix and eliminate voids and air pockets. When pit is approximately one-half backfilled, water thoroughly before placing remainder of backfill. Repeat watering until no more water is absorbed. Water again after placing and tamping final layer of planting soil mix.
- F. Guying and Staking: Stake or guy trees as detailed immediately after planting. Trees shall stand plumb after staking or guying.
- G. Mulching: Mulch within two days of planting. Cover tree and shrub beds with a continuous 3 inch layer of mulch. Keep mulch 3 inches away from trunks of trees and shrubs and the crowns of all groundcovers. Provide a 6 ft diameter mulch saucer around all trees planted within lawn areas.

3.3 TREE AND SHRUB PRUNING

- A. Remove only dead, dying, or broken branches. Do not prune for shape.
- B. Prune, thin, and shape trees and shrubs according to standard horticultural practice. Prune trees to retain required height and spread. Do not cut tree leaders; remove only injured or dead branches from flowering trees. Prune shrubs to retain natural character.

3.4 GROUND COVER AND PLANT PLANTING

- A. Set out and space ground cover and plants according to the planting plan..
- B. Dig holes large enough to allow spreading of roots and backfill with planting soil.
- C. Work soil around roots to eliminate air pockets and leave a slight saucer indentation around plants to hold water.
- D. Water thoroughly after planting, taking care not to cover plant crowns with wet soil.
- E. Protect plants from hot sun and wind; remove protection if plants show evidence of recovery from transplanting shock.

3.5 LAWNS

A. Preparation of hydroseeded areas:

1. Cultivation: All areas to be hydroseeded shall be cleared of all debris before cultivation.
2. Cultivation of areas to receive seed mix may be done by farm disc, harrow or other suitable equipment accepted by the Contracting Officer. This operation shall be done at right angles to the natural flow of water unless otherwise directed. Prior to dicing operation, apply dolomite lime and fertilizer at the rates specified, with dicing to distribute materials to a depth of four (4) inches. Cultivation inside the drip line of trees shall be done by hand. All cultivation areas shall be cleared of debris and rocks larger than one (1) inch in diameter prior to compaction.
3. Grade to produce a uniform rough textured surface ready for a second rolling with a full lawn roller. If water is required to condition the soil for compaction or for dust control, it shall be immediately furnished and applied by the Contractor.

B. Hydroseed:

1. Application Rates: materials shall be applied at the following rates:
 - a. Wood fiber mulch: 2,000 lbs. per acre
 - b. Seed mix: 6 lbs. per 1,000 sq.ft. or as recommended by the seed supplier
 - c. Fertilizer: 1,000 lbs. per acre
2. Seeding:
 - a. Seeding shall not be done during windy weather or when the ground is frozen. Seed fertilizer shall be placed at a rate and mix specified herein.
 - b. Areas inaccessible to above methods of application shall be seeded and fertilized by approved hand methods. Distribution of the material shall be uniform and at the rates specified.
 - c. The Contractor shall notify the Owner's Representative not less than forty-eight (48) hours in advance of any seeding operation and the Contractor shall not begin the work until areas prepare or designated for seeding have been accepted. Following acceptance, seeding and fertilizing of the approved slopes shall begin immediately.

3.6 PLANT MAINTENANCE

- A. Tree and Shrub Maintenance: Maintain plantings by pruning, cultivating, watering, weeding, fertilizing, restoring planting saucers, and resetting to proper grades or vertical position, as required to establish healthy, viable plantings. Spray or treat as required to keep trees and shrubs free of insects and disease.
- B. Ground Cover and Plant Maintenance: Maintain and establish plantings by watering, weeding, fertilizing, mulching, and other operations as required to establish healthy, viable plantings.
- C. Hydroseeded areas: Maintain lawn areas during the growing season as defined from April 15 to November 15. Maintenance includes re-seeding, repair of ruts and erosion, repair of protective

devices, watering, weeding, cutting and the repeating of any or all phase of seeding construction that may be required to obtain a uniform thick and well developed stand.

- D. Protect exterior plants from damage due to landscape operations, operations by other contractors and trades, and others. Maintain protection during installation and maintenance periods. Treat, repair, or replace damaged plantings.

END OF SECTION 32 93 00