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Section 815. LANDSCAPING

815.01. Description. This work consists of providing and planting trees, shrubs, and other plants, including replacements, classified as nursery stock. The Engineer may inspect, select, and reject plants anytime through the second year of the establishment period.

815.02. Materials. Provide materials in accordance with the following:

Topsoil	917
Peat Moss.....	917
Compost	917
Fertilizer	917
Water	911
Nursery Stock	917
Mulching Materials.....	917
Tree Wrapping Materials	917
Balling Material	917
Wire	917
Hose	917
Stakes.....	917

815.03. Construction.

A. **Prepared Soil.** Use prepared soil for landscaping, consisting of a uniform mixture of topsoil, peat moss or compost, and fertilizer. Proportion the prepared soil so that 1 cubic yard of the prepared soil contains $\frac{3}{4}$ cubic yard topsoil, $\frac{1}{4}$ cubic yard of peat moss or compost, and chemical fertilizer as specified in subsection 917.10.A.1.

Thoroughly mix the component materials before final placement.

B. **Site Preparation.** Excavate holes, centered at staked locations, to a diameter that allows 18 inches of prepared soil beyond the ends of bare roots or root balls. The Engineer will approve variance in the size of planting holes as soil conditions or plant requirements dictate. Set the root ball on undisturbed soil at the required depth.

Remove excavated material from the site and dispose of it outside the right-of-way in accordance with subsection 205.03.P. Backfill the planting holes with prepared soil the same day they are dug.

C. **Preparation of Shipments.** Label a sample of each plant species and variety. Provide balled and burlapped or container-grown plants unless otherwise required.

Prepare nursery stock for shipment in accordance with the current ANSI Z60.1 requirements and enclose or cover during transportation to prevent drying.

1. **Balled and Burlapped Stock.** In preparation for spring planting, complete balling and burlapping before bud break. In preparation for planting deciduous plants in the fall, do not begin balling until after the plants begin to harden off. Dig and pack balled and burlapped stock immediately before shipment. Dig, prepare, and transport plants to provide and retain a firm ball of earth. Protect the root balls with wet straw, mulch, or other material approved by the Engineer. Protect the root balls from rain or sudden changes in the weather. The Engineer will not accept trees or plants if root balls are loosened or broken.
2. **Container Grown Stock.** Ensure container grown stock is grown in the container for at least one growing season. The Engineer will not accept plants, other than ground cover plants, with pot-bound root ends.
3. **Bare Root Stock.** Do not injure or remove fibrous feeder roots when digging and packing bare root stock. Maintain the root moisture while transporting the stock to the planting site.

D. Seasonal Limitations. Plant deciduous plants from March 1 to May 15 and from October 1 until the prepared soil freezes. If unusual planting conditions exist or if using container-grown material, the Engineer may alter these planting seasons.

Plant evergreen plants from March 1 to June 1.

E. Care of Plants Before Planting. Immediately following delivery and inspection at the project, heel-in plants with exposed roots in moist soil. Protect heeled-in plants and keep their roots moist until planted. Use a protected, shaded area, or a well-ventilated enclosure for the heeling-in grounds.

Keep the roots of planting stock moist and protected.

Protect tree trunks and branches from injury. The Engineer may reject injured trees.

F. Planting. Do not begin planting until water is available at the project. Water-in plants as they are planted. Water-in the prepared soil around the root ball and roots and firm the soil at intervals during the planting process. Saturate the prepared soil in the planting hole.

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1. **Plants Located on Slopes.** For plants located on slopes, construct a berm of prepared soil half way around each plant on the down slope side. Construct the berm of prepared soil with an inside diameter equal to the planting hole diameter, and no greater than 6 inches high. Do not make the base of the berm more than 18 inches wide.
 2. **Balled and Burlapped Stock.** Set plants plumb. Plant balled and burlapped stock so the depth, after settling, compared to the surrounding ground surface is the same as the depth at the original location of the balled stock. Water-in the prepared soil and eliminate air pockets by tamping the soil at intervals under and around the ball. Do not damage the root ball during tamping operations. After backfilling and tamping the plant hole to half the required depth, remove the burlap and lacing from around the trunk and the upper half of the ball. Continue backfilling the hole with prepared soil until the soil is flush with the ground surface after compaction.
 3. **Container Grown Stock.** Remove container grown plants from the containers at the time of planting. Plant container grown stock in accordance with subsection 815.03.F.2. The Engineer may reject plants with a broken or loosened root and soil ball mass.
 4. **Bare Root Stock.** Preserve the root growth on bare root stock. Do not prune the roots except to remove broken or damaged roots. Plant bare root stock so the depth, after settling, compared to the surrounding ground surface is the same as the depth at the original location of the bare root stock. Hold the exposed roots in the required position with the roots spread out during backfilling and compacting.
 5. **Mulching.** After backfilling is complete, place from 5 inches to 6 inches of shredded bark over the plant hole area.
- G. **Pruning Branches.** Ensure an arborist, certified by the International Society of Arboriculture, prunes branches before planting. Do not use pruning paint.
1. **Deciduous Trees.** Prune deciduous trees to remove dead wood and broken branches. The Engineer may require additional pruning. Prune so that the crown height is one-half the trunk height. Do not cut the primary leader back, unless otherwise required. Cut branches in accordance with ANSI A 300.
 2. **Deciduous Shrubs.** Ensure healthy, symmetrical growth of new wood by pruning deciduous shrubs to remove dead wood and broken branches, thin out canes and cut back or remove

asymmetrical branches and other growth. Prune shrubs to form an outline conforming to the general shape of the shrub type.

3. **Evergreen Trees and Shrubs.** Prune evergreens to remove broken or damaged branches.

H. **Wrapping Deciduous Trees.** Wrap deciduous trees within one week after planting. Wrap the trunk, beginning at the base, just above the roots, below the normal ground line, and extend upward in a spiral with an overlap of half the width of the wrapping strip. Cover the portion of the wrapping below the finished grade with soil. Hold the paper in place with masking tape in at least 5 locations, including the top and bottom of wrapping. Overlap the tape at least 4 times in each of the 5 locations.

I. **Clean Up.** Upon completion of planting, immediately clean up, remove, and dispose of surplus material off site. Repair ruts and turf damage resulting from the planting operation and re-establish turf in these areas in accordance with subsection 816.03 and as directed by the Engineer. Complete clean up before June 1.

J. **Watering and Cultivating.** In addition to the watering-in required at the time of planting, water, cultivate, and remove grass and weeds around each plant at least 5 times during each of the two growing seasons of the establishment period. The Engineer may add or subtract watering as conditions warrant. Notify the Engineer at least 3 days before each watering.

During each watering and cultivation, remove grass and weeds within the mulch ring. Cut grass to 3 inches high, 12 inches beyond the outside perimeter of the mulch ring. Inspect landscaping and remove insect infestations or disease damage to the plants and prune dead wood.

During the first and second watering of the second growing season, use a nitrogen-enriched solution as specified in subsection 917.10.A.2. Apply fertilizer before July 7.

At the first watering of the second growing season, remove and dispose of the guying material, wrapping material, identification tags, and inspection tags. At the final watering, replenish the mulch around the plants to a depth of 5 inches to 6 inches.

1. **Watering with Probe.** Water with a probe that meets the following requirements:
 - a. Is long enough to extend to the depth of the root ball;
 - b. Has a diameter no greater than 1 inch;
 - c. Has a closed pointed end with holes in the lower 4 inches; and

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- d. Is equipped with a control valve for regulating water pressure and volume.

Insert the probe next to the root ball in at least three equally spaced locations around the plant. Adjust the pressure so little or no run-off occurs before placement of the required amount of water. After extracting the probe, close or fill holes remaining in the soil.

2. **Quantity of Water.** Use the following volumes of water for the specified plants:
 - a. For shade trees, 35 gallons per watering;
 - b. For intermediate plants and evergreen trees, 20 gallons; and
 - c. For shrubs, 5 gallons.
3. **Watering and Cultivating Periods.** Water and cultivate during each of the following periods:
 - a. From June 1 to June 15,
 - b. From June 23 to July 7,
 - c. From July 15 to July 29,
 - d. From August 4 to August 18, and
 - e. From September 5 to September 19.

K. **Bracing and Guying.** Brace or guy deciduous trees immediately after wrapping. Brace or guy evergreen trees and bare-rooted deciduous trees immediately after planting.

1. For evergreen trees, use at least the following number of stakes:
 - a. For trees higher than 6 feet, 3 stakes; and
 - b. For trees 6 feet high or less, 2 stakes;
2. For bare-root stock, use at least 2 stakes;
3. For balled stock, use at least the following number of stakes:
 - a. For low-headed trees, 1 stake (the Engineer may omit); and
 - b. For deciduous clump trees, 2 or 3 stakes;
4. For balled stock, deciduous, but not low-headed trees use at least the following number of stakes:
 - a. For calipers greater than 4 inches, 3 stakes;
 - b. For calipers from 2 inches to 4 inches or at least 8 feet high, 2 stakes; and
 - c. For calipers less than 2 inches or less than 8 feet high, 1 stake.

Place one stake on the west side of the plant. If using two stakes, position them on opposite sides of the trunk and secure each stake to the trunk at two-thirds the height of the tree. If three stakes are required, use the tripod method of guying.

To avoid the root ball, anchor the tree by driving stakes no closer than 1 foot from the trunk. Drive stakes parallel to the trunk to within 4 inches of the lower main branches remaining after pruning. Maintain bracing stakes at a uniform height for similar plant or tree sizes throughout the project. Attach the top of the stake to the trunk with No. 11 wire and form a figure-eight shape around the stake and trunk. Encase the wire loop that contacts the tree trunk with sections of hose that extends 6 inches beyond either side of the trunk. Twist guy wires so they do not restrict normal trunk growth and the trunk can move laterally 1 inch to 2 inches. For deciduous clumps, attach each stem to a support stake.

Use three No. 11 wires for the tripod method of tree guying. Encircle the trunk with one end of each guy wire. Encircle the trunk of deciduous trees just above the lower main branches and evergreen trees at a point two-thirds the height of the tree. Encase the wire encircling the trunk in hose that extends 6 inches beyond either side of the trunk. Fasten the other end of each guy to stakes equally spaced around the tree. Place the stakes away from the tree a distance equal to three-quarters the vertical distance from the ground to where the guys are fastened to the trunk. Notch the anchor stakes to prevent the wire from slipping. Drive stakes to at least 18 inches deep and at an angle so the tops point away from the tree.

For the duration of the contract, replace blown down trees or trees damaged by improper bracing or guying at no additional cost to the Department.

Brace or guy replacement plants, planted at the beginning of the second growing season. Maintain guying and wrapping material until project completion, and then remove.

L. **Period of Establishment.** The contract requires an establishment period beginning at the completion of the initial planting and extending through the following two growing seasons. A growing season is the months of June, July, and August.

Provide plants in a healthy growing condition at the start of the establishment period. The Engineer will inspect the plants at the end of the first and second growing seasons to determine acceptability. The Engineer will consider plants unacceptable if they are dead, missing, unhealthy, or otherwise unsatisfactory at the time of inspection, or not planted as required.

Remove dead evergreen plants before winter. Plant replacement plants in accordance with subsection 815.03.F, before May 10 of the following spring planting season. Water replacement plants, planted after the first

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growing season, at the same time and in the same manner as the other plants receiving their second season watering.

Unacceptable plants identified by the Engineer at the end of the second growing season do not require replacement. Remove these plants along with guying materials and dispose of removed plants and guying material off the project.

815.04. Measurement and Payment.

Pay Item	Pay Unit
Site Preparation, Max. (dollar).....	Lump Sum
(Botanical Name).....	Each
Watering and Cultivating, First Season, Min. (dollar).....	Lump Sum
Watering and Cultivating, Second Season, Min. (dollar).....	Lump Sum

A. **Site Preparation.** The unit price for **Site Preparation, Max (dollar)** includes the cost of digging holes, providing prepared soil, backfilling holes, and disposing of excess excavated material.

B. **Plants.** The Engineer will measure plants by the units shown on the plans and methods specified in ANSI Z 60.1. The Department will not pay for the pay item, **(Botanical Name)** until the plant is pruned, planted, watered-in, wrapped, braced or guyed, and mulched.

The Department will not make additional payments for replacement plants.

C. **Watering and Cultivating.**

1. **First Season.** The Department will pay 20 percent of the lump sum price for **Watering and Cultivating, First Season, Min. (dollar)** at the completion of each of the five watering and cultivating operations. Payment for **Watering and Cultivating, First Season, Min. (dollar)** includes the cost of the following:

- a. One watering and cultivating operation;
- b. Providing and mixing fertilizer with the water as required; and
- c. Removal and disposal of unacceptable plants.

2. **Second Season.** The Department will pay for **Watering and Cultivating, Second Season, Min. (dollar)** as a lump sum at the completion of the second growing season. The unit price of **Watering and Cultivating, Second Season, Min. (dollar)** includes the cost of the following:

- a. Five watering and cultivating operations;
- b. Providing and mixing fertilizer with the water;
- c. Removal and disposal of unacceptable plants; and

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- d. Removal of guying material identified by the Engineer at the end of the second growing season.

For each unacceptable plant identified, the Engineer will calculate a 50 percent reduction in the unit price for the relevant **(Botanical Name)** pay item, and will deduct that amount from the pay item, **Watering and Cultivating, Second Season, Min. (dollar)**.

3. **Supplemental Watering.** The Department will pay for supplemental watering, in addition to the 10 watering operations required, at 20 percent of the associated lump sum contract unit price. The Department will reduce the relevant lump sum contract unit price by 20 percent for each deleted watering.