

**Division's "Vines and Ground Cover List" in effect on the date of the invitation for bids. Copies of the complete "Vine and Ground Cover List" in effect on any date may be obtained from the Division.

*** Size designations will be in accordance with the "American Standards for Nursery Stock".

SECTION 654 TREE AND SHRUB PLANTING

654.1-DESCRIPTION:

This work shall consist of furnishing, delivering, and planting nursery-grown or collected plants, in accordance with these Specifications and at locations shown on the Plans or designated by the Engineer. This work shall include the furnishing of topsoil and related materials together with all other work including clean-up of planted areas.

654.2-MATERIALS:

654.2.1-Topsoil: Topsoil for plant backfill shall conform to the applicable requirements of [651](#).

654.2.2-Water: Water shall conform to the requirements in [652.2](#).

654.2.3-Ground Agricultural Limestone: Ground agricultural limestone shall conform to the requirements of [715.25](#).

654.2.4-Fertilizer: Fertilizer for landscape plantings shall conform to the applicable requirements of [715.26](#).

654.2.5-Mulch and Mulch Anchor: Mulch for landscape plantings shall conform to the requirements of [715.27.2](#).

654.2.6-Trees and Shrubs: Trees and shrubs shall conform to the requirements of [715.35](#). The trees and shrubs shall be true to the type and size indicated on the Plans.

Collected plants may be used in place of nursery grown plants only when called for on the plans.

654.2.7-Tree Paint: Tree paint shall conform to the requirements of [715.36](#).

654.2.8-Miscellaneous Materials: Wire, hose, stakes, tree wrapping paper, anti-desiccant spray, and other incidental materials shall conform to the

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requirements of 715.37.

CONSTRUCTION METHODS

654.3-INSPECTION AND DELIVERY OF PLANT MATERIAL:

The Contractor shall notify the Engineer at least five days in advance of digging or shipping of plants from the nursery or collecting source. All plants will be subject to inspection where growing in the nurseries or collecting areas.

All plants shall be dug with care by experienced workmen, retaining essential roots and avoiding mechanical damage to root systems. All plants shall arrive with their roots in a moist and healthy condition. Each species or variety shall be handled and packaged in an approved manner and as required by soil and climatic conditions at the time of digging, with due regard to conditions of shipment and time to be consumed in transit and delivery. All plants shall be legibly tagged with name and size. All balled and burlapped plants shall be handled by the earth ball only.

All evergreen and all deciduous trees, regardless of size, and all other plants so designated on the Plans shall be balled and burlapped for shipment. All such plants shall be so dug and transported as to provide and retain a firm ball of earth. All balled and all bare-root material shall be adequately protected from severe changes in temperature and wind-burn while in transit.

Upon delivery to the Project, plants will be inspected for number, type, species, size, quality, and condition. Defects or injuries, such as dried out or broken roots and tops, evidence of "sweating", mildew, freezing, or broken or manufactured rootballs, will be cause for rejection, and immediate steps shall be taken to replace rejected plants.

654.4-CARE AFTER DELIVERY:

Plant material delivered to the Project and accepted shall be planted immediately, or "heeled-in" in moist soil or other approved moist material in a manner as shown on the Plans. All "heeled-in" plants shall be kept moist and protected until planted.

654.5-DIGGING HOLES FOR PLANTS:

Planting holes shall be excavated according to the following table:

PLANTING HOLE DIAMETER			
Rootball Inches (mm) (Specified)	Planting Hole Inches (mm) (Approximate)	Rootball Inches (mm) (Specified)	Planting Hole Inches (mm) (Approximate)
8 (200 mm)	20 (500 mm)		
10 (250 mm)	22 (550 mm)	28 (700 mm)	49 (1 225 mm)
12 (300 mm)	24 (600 mm)	32 (800 mm)	56 (1 400 mm)
14 (350 mm)	28 (700 mm)	38 (950 mm)	66 (1 650 mm)
16 (400 mm)	32 (800 mm)	42 (1 50 mm)	73 (1 825 mm)
18 (450 mm)	34 (850 mm)	48 (1 200 mm)	84 (2 100 mm)
20 (500 mm)	36 (900 mm)	54 (1 350 mm)	94 (2 350 mm)
22 (550 mm)	38 (950 mm)	60 (1 500 mm)	105 (2 625 mm)
24 (600 mm)	42 (1 050 mm)	72 (1 800 mm)	126 (3 150 mm)

The depth of the hole shall extend 8 inches (200 mm) below the depth of the rootball. During normal weather conditions, digging and planting holes may be allowed as much as two weeks in advance of planting. During hot dry weather, the planting holes shall be dug just prior to planting. When holes present a hazard along the highway, they should be dug immediately prior to planting.

Planting holes for container grown plants shall be dug to the size required for the equivalent balled and burlapped plants.

654.6-PLANT BACKFILL:

All backfill for planting shall be four parts topsoil mixed with one part peat moss (loose measurement) or other approved additive. Eight pounds (4.75 kg) of fertilizer shall be added per cubic yard (meter) of backfill and bulk mixed with the topsoil and peat moss.

Any adjustment needed in the pH reaction of the backfill material will be specified in the Plans.

The rate of fertilizer application for individual plant replacement shall be as follows:

Deciduous trees—1 lb/in. (0.02 kg/mm) diameter

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Evergreen trees--One pound (0.5 kg) per tree

Small flowering trees--One pound (0.5 kg) per tree

Shrubs--One-half pound (0.25 kg) per plant.

No backfill in a frozen or muddy condition shall be used.

654.7-PLANTING:

654.7.1-Planting Season: Planting season for balled and burlapped evergreens shall begin September 15. Planting season for all deciduous balled and burlapped plants and all bare root plants shall begin October 15. No bare root plants shall be planted during freezing temperature. The cut-off date for fall planting and the starting date for spring planting will be determined by the Engineer. All initial planting shall be completed by May 20.

Any extension of time granted due to a delay in giving notice to proceed, as indicated in the Proposal, is not intended to extend the initial planting deadline of May 20. It is the intent of this specification that all plants shall be in the planting holes by May 20. Should there be a delay in giving notice to proceed, the staking, guying, wrapping, and other incidental items may be deferred by the Engineer until all plants are placed in the planting holes. Such approval of the planting procedure will not relieve the Contractor of their responsibility for loss of any plants.

654.7.2-Planting Method: All balled and burlapped plants shall be planted so the top of the ball is slightly above the natural ground level to allow for normal settlement unless otherwise specified on the Plans. When planting beds, the individual plants shall be selected and arranged according to spread and height to present a uniform appearance.

Backfill material under the rootball or roots shall be tamped prior to placing the plant in the hole.

When planting balled and burlapped plants, the burlap and twine may be left intact; however, any twine attached to the stem and considered to have a girding or detrimental effect shall be removed. Bare-rooted plants shall be placed in the planting holes with the roots spread out in a natural position while the specified backfill is placed. Nonplantable containers shall be carefully removed from all container grown or potted plants immediately prior to planting.

Planting beds shall be prepared by destroying the existing vegetation before excavating the planting holes. Recommendations for control of existing vegetation will be shown on the Plans.

Sufficient amounts of water, without puddling, shall be used in the process of planting to settle the backfill material around the roots or ball. Additional backfill material shall be placed and further compaction accomplished by tamping. This watering is not to be confused with the maintenance procedure in 654.14.1.

During the initial planting period, September 15 to May 20, any plant determined by the Engineer not to be in an acceptable growing condition, or

failing to meet other requirements of these specifications, shall be removed from the project and replaced immediately with nursery stock meeting the specifications. It is the intent of this specification that all plants shall be alive at the beginning of the growing season.

654.8-PRUNING:

Primarily, all dead and broken branches shall be removed from deciduous and evergreen plant material during the process of planting. Further pruning shall be carried on in accordance with the normal nursery practice or as directed by the Engineer. All cuts over 1 in. (25 mm) shall be painted with a tree paint.

654.9-STAKING AND GUYING:

All deciduous and evergreen trees and all ornamental flowering trees (including multiple stem) shall be staked in accordance with tree staking details shown on the Plans and to the satisfaction of the Engineer.

654.10-MULCHING:

Mulch material shall be furnished and placed around the plants as soon as possible after planting. However, during extremely wet periods, the application of mulch shall be delayed and placed as directed by the Engineer.

The mulch shall be applied in the saucer areas of individual trees and shrubs and over the entire area of shrub beds. Heavy mulches like woodchips and wood bark products shall be applied to a depth of 3 inches (75 mm). Light mulch material shall be applied 4 inches (100 mm) deep. When black polyethylene film is specified for weed control, the mulch depth shall be reduced to 2 inches (50 mm).

654.11-WRAPPING AND FOLIAGE PROTECTION:

The trunks of all deciduous and small flowering trees shall be wrapped with four inch (100 mm) waterproof sisal paper. The wrapping shall start from the ground and extend up the trunk in a spiral manner with one-third overlap, ending with one wrap above the lowest branch. The wrapping shall be neatly secured with binder twine at approximately 18-in spacings and at the top and bottom.

All evergreens shall be thoroughly sprayed at the nursery prior to delivery, with an anti-desiccant spray (protective emulsion) at the rate specified by the manufacturer. All deciduous trees and shrubs in any stage of leafing out, at the time of delivery, shall receive the anti-desiccant spray. Certification of this spray application will be required by the Division. Deciduous trees and shrubs that have leafed out while in the "healing-in" area will require the anti-desiccant spray before being transported to the planting site.

654.12-RAIN BASINS:

A shallow rain basin equal to the diameter of the planting hole shall be formed by shaping the soil around each tree or shrub and shall be maintained

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until final inspection and acceptance of the work.

654.13-CLEAN-UP AFTER PLANTING:

After the planting has been completed, all planting sites shall be cleaned up. Subsoil, rock, excess topsoil, and other waste material shall be removed and disposed of as directed.

All holes dug and not used, or areas disturbed in attempting to find a suitable planting site, shall be refilled by the Contractor, and the area shall be restored to its original condition and reseeded.

654.14-CARE AND REPLACEMENT OF PLANTS:

654.14.1-Care: The Contractor shall maintain the plants in a healthy, living condition during the life of the Contract, which includes any warranty period indicated in the Contract, and shall maintain an adequate supply of moisture in the root zone at all times.

The Contractor and the Engineer shall make a monthly inspection of the plantings to determine the need for maintenance and water during the first growing season, June through October. Any maintenance determined necessary shall be taken care of during the two-week period immediately following the inspection. When moisture in the root zone is deficient, watering shall be started within 48 hours with sufficient labor and equipment to completely water all the plants within a two-week period unless otherwise directed by the Engineer.

Other maintenance required during the contract period shall include:

- i. The control of weed and grass growth, by destroying the top growth as well as roots, in plant beds and individual plant saucers.
- ii. Protect plants from damage by insects and diseases.
- iii. Repair rain collars and replace any lost mulch.
- iv. Maintain stakes and guys supporting trees, and any other practices necessary to maintain the plants in a healthy, living condition.

654.14.2-Replacement of Plants: The Contractor and the Engineer will make an inspection of the plantings between September 1 and 10 following the initial planting period, to determine the number of dead, missing or defective plants, for which replacement will be required.

During this fall replacement period, September 15 through November 30, all maintenance including stake and wire tightening, mulch replacement, rain collar repair, pruning or trimming, trunk wrapping, and removal of any wire tags shall be accomplished.

The replacement plants shall be planted in the same manner as the original plants with necessary backfill and mulch added to accomplish the job. The fertilizer shall be added in the hole prior to replacing the plant. However, when a plant has been lost due to poor drainage or other adverse soil condition, the replacement shall be planted at a more acceptable location, and the old site shall be restored to its original condition.

All replanting and maintenance shall be completed by November 30 for final acceptance of the Contract by December 15.

654.15-METHOD OF MEASUREMENT:

The quantity of plants to be paid for will be the number of living trees or shrubs planted in accordance with these Specifications and accepted. Only living plants in healthy condition at the time of final inspection will be accepted.

Progress payment for the initial planting of trees and shrubs will be based on the premise that 90 percent of the work has been completed when the plants have been completely planted. The remaining 10 percent withheld will be considered for maintenance, plant replacement, and for any delayed mulching when authorized by the Engineer. Retainage, from the amount determined as above, will be in accordance with 109.6.

The final acceptance and payment for any particular plant will be made after completing proper care and replacement as described in 654.14.

Water for maintenance during the period of establishment will be measured by the gallon (liter), expressed in thousand-gallon (liter) units.

654.16-BASIS OF PAYMENT:

The number of plants, determined as provided above, will be paid for at the contract unit prices bid for the items listed below, which prices and payments will constitute full compensation for furnishing and delivering plants and all incidental materials including water required during the process of planting, topsoil, mulch, fertilizer, ground agricultural limestone, and additives; for planting, staking, pruning and for performing all the work prescribed in a workmanlike and acceptable manner, including all labor, equipment, tools, and incidentals necessary to complete the work.

Maintenance work other than watering will be included in the contract unit prices bid for each plant.

The accepted quantities of water used during the period of establishment will be paid for at the contract unit price per 1,000 gal. (L), which price shall be full compensation for furnishing, delivering, applying, and performing all other work. No payment will be made for watering at the time of original planting or when planting replacements.

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654.17-PAY ITEMS:

ITEM	DESCRIPTION	UNIT
654001-*	TREE, DECIDUOUS, "***key number, ***size"	EACH
654002-*	TREE, ORNAMENTAL FLOWERING, "***key number, ***size"	EACH
654003-*	SHRUB, DECIDUOUS, "***key number, ***size"	EACH
654004-*	SHRUB, EVERGREEN, "***key number, ***size"	EACH
654005-*	TREE, EVERGREEN, "***key number, ***size"	EACH
654006-*	WATER FOR PLANTS	THOUSAND GALLON (LITER)

* Sequence number

** The Key Numbers for plants are referenced to the Division's "trees and Shrubs List" in effect on the date of invitation for bids. Copies of the "Trees and Shrubs List" in effect on any date may be obtained from the Division.

*** Size designated will be in accordance with "American Standards for Nursery Stock".

**SECTION 655
MATTING FOR EROSION CONTROL**

655.1-DESCRIPTION:

This work shall consist of furnishing and placing erosion control matting in accordance with these specifications and at the locations shown on the plans or designated by the Engineer.

655.2-MATERIALS:

The matting shall meet the requirements specified in 715.24. Devices used to anchor the mat shall be as recommended by the manufacturer of the matting and be of sufficient strength and size to secure the mat until it is anchored by vegetation, siltation, etc.

CONSTRUCTION METHODS

655.3-PLACING:

The area to be covered shall be prepared as a fine seedbed, fertilized and seeded before the matting is applied.

The erosion control mat shall be placed and anchored in accordance with the recommendations of the manufacturer of the matting. The mat shall be adequately watered to firmly bond the mat to the soil and aid in the germination of the seed.

655.4-MAINTENANCE AND REPAIRS:

The Contractor shall maintain the areas upon which the matting is placed until all work on the Contract has been completed and accepted.