

Section 4170. Landscape Plant Materials

4170.01 DESCRIPTION.

Trees, shrubs, and vines used in roadside development.

4170.02 MATERIALS.

- A. By submitting a proposal and accepting award of the contract, the Contractor acknowledges that it has investigated the supply of planting stock available and has obtained firm commitment from suppliers assuring delivery of the specified plant stock as required for completion of the contract. A list of suppliers and the materials to be furnished by each of them will be required at the preconstruction conference.
- B. Meet the minimum requirements of size and grade in the American Standard for Nursery Stock ANSI Z 60.1. Sizes and grades for bare root nursery grown trees and shrubs and balled and burlapped (B & B) trees and shrubs as set forth in ANSI Z 60.01 are listed below:

1. Bare Root Nursery Grown Trees.

Meet the minimum requirements for diameter, height range, maximum height, and minimum root spread. Measure the diameter of the trunk 6 inches (150 mm) above ground level up to and including 4 inch (100 mm) diameter, and 12 inches (300 mm) above ground level for larger sizes.

Table 4170.02-1: Minimum Requirements (Nursery Grown Trees)

Diameter inches (mm)	Height Range feet (m)	Maximum Height feet (m)	Minimum Root Spread inches (mm)
1/2 (15)	5 - 6 (1.5 - 1.8)	8 (2.5)	12 (300)
3/4 (20)	6 - 8 (1.8 - 2.5)	10 (3.0)	16 (400)
1 (25)	8 - 10 (2.5 - 3.0)	11 (3.5)	18 (450)
1 1/4 (30)	8 - 10 (2.5 - 3.0)	12 (3.8)	20 (500)
1 1/2 (40)	10 - 12 (3.0 - 3.7)	14 (4.4)	22 (550)
1 3/4 (45)	10 - 12 (3.0 - 3.7)	14 (4.4)	24 (600)
2 (50)	12 - 14 (3.8 - 4.4)	16 (5.0)	28 (700)
2 1/2 (60)	12 - 14 (3.8 - 4.4)	16 (5.0)	32 (800)
3 (80)	14 - 16 (4.4 - 5.0)	18 (5.6)	38 (950)

2. Bare Root Nursery Grown Shrubs.

Meet the following minimum requirements:

**Table 4170.02-2: Minimum Requirements
(Nursery Grown Shrubs)**

Size (height) of Plant feet (m)	Min. Root Spread inches (mm)
1 1/2 (0.50)	10 (250)
2 (0.60)	11 (275)
3 (0.90)	14 (350)
4 (1.25)	16 (400)
5 (1.50)	18 (450)
6 (1.80)	20 (500)

3. Balled and Burlapped Trees and Shrubs.

Meet the minimum requirements shown in Table 4170.02-3 for number of transplantings and sizes of balls:

Table 4170.02-3: Minimum Requirements

Size	Transplantings	Ball Diameter
Prostrate and Spreading Types (Pfizer, Savin, etc.)		
(Height) feet (m)		Inches (mm)
1 1/2' (0.50)	2	10 (250)
2' (0.60)	3	12 (300)
2 1/2' (0.80)	4	14 (350)
3 1/2' (1.00)	4	18 (400)
Upright, Medium Height Types (Chinese, Column, Canaert, etc.)		
(Height) feet (m)		Inches (mm)
1 1/2' (0.50)	2	10 (250)
2' (0.60)	3	12 (300)
3' (0.90)	3	13 (350)
4' (1.25)	4	14 (350)
5' (1.50)	4	16 (400)
Large Tree Types (Pine, Spruce, etc.)		
(Height) feet (m)		Inches (mm)
3' (0.90)	3	14 (350)
5' (1.50)	4	20 (350)
6' (1.80)	4	22 (400)

Shrubs and Small Trees (Hawthorn, Redbud, Amur Maple, etc.)		
(Height) feet (m)		Inches (mm)
2' (0.60)	3	10 (250)
3' (1.50)	3	12 (300)
4' (1.25)	3	14 (350)
5' (1.50)	4	16 (400)
Large Shade Trees (Maple, Oak, Hackberry, etc.)		
(Dia. of Trunk) Inches (mm)		Inches (mm)
1 (25)		16 (400)
1 1/4 (30)		18 (450)
1 1/2 (40)		20 (500)
1 3/4 (45)		22 (550)
2 (50)		24 (600)

4. Container Grown Plant Material.

- a. Container grown plant material may be substituted for the same size, transplantings, and variety of B & B plant material as specified without any additional compensation. Submit a certification to the Engineer stating that container grown material has been grown in the container for no less than 1 year.
- b. Ensure the container is of a size to permit development of a fibrous root system without the plant becoming root bound. No circling of the root system will be accepted.
- c. Removal of the plant from the container will be required regardless of the container composition.

5. Quality of Plant Material.

- a. Furnish only nursery grown stock, unless specified otherwise, that has been transplanted or root pruned two or more times according to the kind and size of plants.
- b. Furnish plants typical of their species or variety.
- c. Ensure plants are free from objectionable deformities, injurious insects or other plant pests, plant diseases, moldy or dried roots, or serious damage to the trunk, bark, roots, branches, or leaders which, in the judgment of the Engineer, will not allow the plant to develop properly to its natural shape. The Engineer will reject all plant material which fails to comply with these specifications. Immediately remove these materials from the project.
- d. When possible, furnish plant material from stock grown in the same plant hardiness zone as Iowa or in a zone north of Iowa. Evergreen plant material that has approximately 1 inch (25 mm) or greater candle growth will not be accepted. Furnish bare root material that is in a dormant condition at the time of planting. Container grown or balled & burlapped material may be furnished in leaf, but care should be given to protect material from late frost.

6. Substitution.

Where evidence is submitted that a specified plant can not be obtained, substitution may be made with the Engineer's approval.

- C.** Comply with rules and regulations of State Entomologist of Iowa relative to nursery inspection of Nursery Stock according to provisions set forth in Section 177A.5 of Iowa Crop Pest Act, Chapter 177A, Code of Iowa.

4170.03 TAGGING OF MATERIALS.

- A.** All stock furnished must be true to name and legibly tagged as to name, size, and number of transplants, according to the nursery standards of practice as recommended by the American Association of Nurserymen.
- B.** Verify nomenclature complies with the latest edition of Standard Plant Names published by the American Joint Committee on Horticultural Nomenclature prior to the date of the award of contract.

4170.04 INSPECTION OF PLANT MATERIAL.

Inspection of plant material may be made at the nursery or collecting field by an authorized representative of the Contracting Authority. Final acceptance will not be made until the material has been delivered and installed.

4170.05 SAMPLES.

The Engineer may require samples to be submitted before stock is shipped from the nursery to the planting site.

4170.06 GOVERNMENT INSPECTION.

- A.** Furnish only plant material complying with Federal and State laws with respect to inspection for plant disease and infestation. Provide all inspection certificates required by law to this effect with each shipment, invoice, or order of stock. On arrival, file the certificate with the Engineer.
- B.** Comply with rules and regulations of the State Entomologist of Iowa, relative to nursery inspection of nursery stock according to current provisions of the Iowa Administrative Code.

4170.07 PREPARATION OF PLANTS FOR SHIPMENT.

- A.** Furnish plants, except container grown material, from the nursery row, dug with reasonable care and skill.
- B.** Avoid unnecessary damaging or removing fibrous roots.
- C.** Take precautions customary in good trade practice to ensure arrival of the plants at their destination in good condition for successful growth.
- D.** Lift B & B plants from the nursery row with a firm ball so as to retain as many fibrous roots as possible.

4170.08 SHIPMENT OF PLANTS.

- A.** Pack material in such manner to ensure adequate protection against climatic, seasonal, or other damages during transportation.
- B.** Place bare root trees and shrubs in bundles. Carefully protect roots with wet straw, moss, or other suitable material which will assure arrival of plants at destination with roots in a moist, healthy condition.
- C.** Protect evergreens during transportation with wet straw, moss, or other suitable material.
- D.** Further protect plant material with a tarpaulin when being transported in an open vehicle.

4170.09 INCIDENTAL MATERIALS FOR PLANT INSTALLATION.

Meet the requirements for materials of the following types to be furnished for the proper installation of plant materials:

A. Topsoil.

- 1. High quality soil consisting of the top 6 inches (150 mm) of field or pasture loam containing a good supply of humus and a high degree of fertility. Do not use surface soils from ditch bottoms, drained ponds, and eroded areas, or soils which are supporting growth of noxious weeds or other undesirable vegetation.
- 2. A pH value from 6.0 to 7.5.
- 3. Free from hard clods, rocks, and other debris larger than 2 inches (50 mm) in diameter.

B. Fertilizer.

- 1. Initial application of 0-46-0 triple super phosphate.
- 2. Second application of 20-10-10 chemically combined commercial fertilizer.

C. Staking and Guying and Anchoring.

1. Stakes.

a. Use either:

- Yard lumber of 2 inches by 2 inches (50 mm to 50 mm) nominal dimension, permitting small knots that do not impair serviceability, or
- Steel posts meeting requirements of [Article 4154.09](#).

b. Cut to the length specified in [Article 2610.03, F](#).

2. Guys.

- a.** Good commercial quality No. 11 (3.06 mm diameter) wire or approved equal.

- b. Use pieces of new fabric reinforced garden hose or an approved equal to protect the plants from damage by guys.

3. Anchors.

Steel of the sizes specified in [Article 2610.03, F](#), as approved by the Engineer.

D. Mulch.

As specified in the contract documents.

- A.** Unless stated elsewhere on the contract documents, use material consisting of shredded bark or shredded wood, or a mixture containing no more than 50% wood chips. Allow Engineer to visually inspect material prior to application.

- B.** Comply with the following requirements:

- Use tree bark and wood chips consisting of either hardwood or softwood as produced by a mechanical debarker or chipping machine.
- Ensure mulch is reasonably free from leaves, twigs, dust, toxic substances, and other foreign materials.

- C.** Mulch material consistently delivered in excessively wet condition may be rejected by Engineer.

E. Tree Wrap.

Crinkle type, kraft, tree wrap paper 4 inches (100 mm) wide, or a tree wrap approved by the Engineer.