
PLANT MATERIAL AND PLANTING**PART 1 - GENERAL****1.01 SECTION INCLUDES**

- A. Submittals, Quality of Plant Material, Handling, and Storage
- B. Plant Establishment Period and Replacement
- C. Measurement for Payment

1.02 DESCRIPTION OF WORK

This section shall include the furnishing and installation of plant material, the protection, maintenance, guarantee, and replacement of plants for completed planting work as specified in the contract documents.

1.03 SUBMITTALS

Follow the General Provisions (Requirements) and Covenants, as well as the following:

- A. Submit copy of current certification that Contractor is an Iowa Certified Nursery Dealer or Grower prior to starting work.
- B. All plant materials shall comply with State and Federal laws with respect to inspection for plant disease infestation. Any inspection certificate or permit required by law to this effect shall accompany each shipment, invoice, or order of stock. File each certificate or permit, upon arrival, with Owner. Payment of all permits and fees provided at no additional compensation.
- C. Submit written maintenance instructions recommending procedures for maintenance of all plant material types including watering, insect, and disease control, fertilizing, and pruning, tree wrap, and staking; prior to final acceptance.
- D. Provide certification to Engineer stating that container grown material has been grown in the container for not less than one year.
- E. Provide a sample of the mulch proposed in this project for approval from the Engineer.

1.04 SUBSTITUTIONS

Follow the General Provisions (Requirements) and Covenants, as well as the following:

Where evidence is submitted that a specified plant cannot be obtained, substitution may be made upon approval of the Engineer.

1.05 DELIVERY, STORAGE, AND HANDLING

Follow the General Provisions (Requirements) and Covenants, as well as the following:

- A. Take all precautions customary in good trade practice in preparing plants for delivery to the site to insure arrival of the plants at destination in good condition for successful growth.
- B. Dig, pack, transport, and handle plants with care to insure protection against injury.
- C. Plants shall be handled in such a manner as to ensure adequate protection from any damage such as climatic, seasonal, wind damage, or other damage during transportation or temporary storage.

1.05 DELIVERY, STORAGE, AND HANDLING (Continued)

- D. Plant root systems, except for container grown, shall be protected with wet straw, moss, or other suitable material which will assure arrival at destination and during temporary storage with root systems in a moist, healthy condition.
- E. All plants shall be protected with a tarpaulin when being transported in an open vehicle.
- F. When approved by Engineer, temporary storage of plants on the project site may be allowed. When temporary on-site storage is not approved, the Contractor shall provide such facilities and location without additional compensation.
- G. Contractor shall heel-in plants and maintain during temporary storage by providing moist straw, moss, or other suitable material to protect root systems, watering, and protection from excessive sun, wind, and inclement weather conditions; providing a healthy vigorous plant when planted.

1.06 SCHEDULING AND CONFLICTS

Follow the General Provisions (Requirements) and Covenants, as well as the following:

Notify Engineer at least 3 calendar days prior to start on installation of plant material.

1.07 SPECIAL REQUIREMENTS**A. Quality Assurance:**

1. All plant material shall meet the minimum requirements of size and grade in the latest edition of American Standard for Nursery Stock, ANSI Z60.1.
2. Plant names indicated comply with the latest edition of "Standardized Plant Names" as adopted by the American Joint Committee of Horticultural Nomenclature. Names of varieties not listed conform generally with names accepted by the nursery trade. All plants shall be true to name and tagged legibly as to name in accordance with nursery standards of practice as recommended by the American Nursery and Landscape Association.
3. Quality of Plant Material:
 - a. All plants shall be nursery grown in a similar climatic zone as this project.
 - b. One-sided branching plants from tightly planted nursery rows will be rejected.
 - c. All plants shall be healthy specimens without objectionable deformities, voids, and open spaces, with well-developed branch and root systems; true to height, shape, and character of growth of the species or varieties. Plants shall show appearance of good health and vigor.
 - d. All plants shall be free of injurious insects, insect eggs, borers, and all forms of infestation, plant diseases, moldy or dried roots, or damage to trunk, bark, branches, leaders or root systems, or cut-leaders. All plants shall be free of defects, disfiguring knots, sunscald injuries, and frost cracks. All plants to be free of rodent damage to bark and buds.
4. Plants may be inspected and approved at the place of growth by Engineer for compliance with specification requirements for quality, size, and variety; travel at the expense of the Engineer. Such approval does not waive the right to reject any plant material after it has been delivered to the site and/or installed.
5. All plants shall be inspected by the Engineer prior to planting.

1.07 SPECIAL REQUIREMENTS (Continued)

6. A planting list of all plants including a schedule with sizes, quantities, and other requirements is shown on the plans. In the event that quantity requirements or material omissions occur in the planting material list, the planting plan shall govern.

B. Plant Material Warranty:

1. Warrant each plant to remain alive and be in healthy, vigorous condition for a period of 1 year after completion and acceptance of the plant material and installation.
2. Warranty shall not include damage or loss of plant material caused by fires, acts of God, acts of vandalism, or negligence on the part of the Owner.
3. Warranty Inspection:
 - a. Inspection of plants will be made by Engineer at the expiration of the one 1 year warranty period.
 - b. All plants that are missing or not in a live, healthy growing condition shall be listed and the Contractor shall be held liable for replacement with equivalent plants of same species and size.

C. Establishment Period: The plant establishment period shall be the period of time from the beginning of the contract to the end of the plant material warranty. Plant establishment shall consist of caring for the project as specified herein until the expiration of the plant material warranty, which is one year after the project is accepted by the Engineer.

1. **Maintenance:** The Contractor shall care for all plants during the plant establishment period as may be necessary to keep plants in a live, healthy growing condition.
 - a. Pruning, cultivating, removal of weeds from planting beds and mulch areas; remove all weeds prior to review for completion.
 - b. Watering at the minimum rate recommended by the nursery to enhance early root growth.
 - c. Adjustment of stakes and ties to maintain plant in upright and plumb condition.
 - d. Re-set settled plants to proper grades and position. Restore planting saucer and mulch; adding planting soil and mulch as may be required.
 - e. Application of appropriate insecticides and fungicides necessary to maintain plants free of insects and disease.
2. **Plant Condition:** All plants shall be in a live, healthy, and growing condition both at the date of completion before acceptance of the project by the Engineer and at the end of the plant establishment period.

D. Replacement: Contractor shall replace all plants not in a live, healthy, and growing condition without additional compensation, except as follows: Otherwise healthy plants that have been vandalized during the period covered by the planting bond, are not the Contractor's responsibility.

1. Upon notice from Engineer, the removal from site of rejected plants and the replacement of plant material shall be plants furnished of the same species and size and installed as originally specified at no additional compensation.
2. All replacement plants shall be inspected by Engineer prior to planting.
3. Maintain replacement plants as specified for original plants.
4. Replacement plants shall have a 1 year warranty after acceptance of replacement. The warranty shall cover all trees and shrubs to be alive, healthy, and good growing condition and the Contractor shall be liable for replacement with equivalent plants of same species.

1.07 SPECIAL REQUIREMENTS (Continued)

5. Make all necessary repairs to original condition the grades, lawns, and paving due to replacement of plant material installation.

1.08 MEASUREMENT FOR PAYMENT

- A. Each plant variety, size, and root condition will be measured by count of accepted plants in place. Unit price of each plant shall include the delivery, materials, installation, warranty, applicable taxes, maintenance, replacements, mulch, staking, and fertilizer.
- B. Lump Sum: The complete installation of all plants including delivery, materials, warranty, maintenance, applicable taxes, replacements, mulch, staking, and fertilizer.

PART 2 - PRODUCTS**2.01 PLANT MATERIALS**

- A. Plants or plant material shall include trees, shrubs, ground covers, vines, flowers, and other plants illustrated in the contract documents.
- B. Provide plants typical of their species and variety in a good healthy condition in accordance with [Section 9030, 1.07, A](#).
- C. Plants shall meet the requirements for spread and height indicated on the plans.
- D. Plants larger than those specified in the plant list with corresponding root system may be used upon approval of the Engineer.
- E. Plants with broken or cut back terminal leaders may be rejected.
- F. Plants planted in rows shall be matched in form and size; unless specified or indicated otherwise on the plans.
- G. All plants which fail to comply with these specifications in any way will be rejected by the Engineer and shall be removed immediately from the project site by the Contractor.
- H. Balled and Burlapped Plants (B&B):
 - 1. Root balls shall be firm and unbroken, moist, and of the specified size.
 - 2. Broken or loose root balls will be rejected. Failure to conduct good handling and digging practices may be cause for rejection of plant.
 - 3. No manufactured or artificially produced or mudded-in root balls will be accepted.
 - 4. A container grown plant, in lieu of a "B&B" root ball, will be accepted provided it meets specified sizes, complies with "American Standard for Nursery Stock" (ANSI Z60.1), and meets criteria for container grown plants.
- I. Container Grown Plants (C):
 - 1. Grown in sufficiently sized container for a minimum of 1 year with a root system to have developed to hold its soil together, firm, whole, and moist when taken from the container.
 - 2. No loose root systems in the container nor root bound nor circling of the root system will be accepted.
- J. Bare Root Plants (BR):
 - 1. Bare root plants may only be used where shown on plans or as approved by Engineer.
 - 2. Bare root plantings shall have substantially all of the root system in tact, with clean cuts on roots. Root system to be packed in moisture - retaining material and bagged to protect the root system from drying out.
 - 3. Prior to planting, bare root plants to be properly pruned and sweated in accordance with the nursery source instructions.
 - 4. All bare rooted plants to be dormant or breaking bud if sweated at the time of planting and to be planted immediately upon arrival to project site, without temporary storage.
 - 5. Planting season for all bare root plants shall not be later than May 15.

2.02 MULCH

- A. Provide sample for approval by Engineer.
- B. Mulch shall consist of premium finely shredded or ground hardwood chips graded to 1/4 inch to 1/2 inch diameter and maximum of 3 inches in length. Green or freshly chipped or shredded mulch will be rejected.
- C. Mulch to be free of weeds, weed seed, chaff, diseases, or other foreign material.
- D. Other material may be used upon written approval of Engineer.

2.03 PLANTING SOIL

- A. Excavated soil from the planting pit may be used in preparation of planting soil for backfilling around root system of planted material.
- B. At option of Contractor, to submit a proposed mixture of planting soil to be approved by Engineer.
- C. Do not use frozen or muddy mixtures for backfilling.

2.04 SIDEWALK TREE WELLS PLANTING SOIL

- A. Do not reuse soil excavated from planting pits for sidewalk tree wells.
- B. Provide good topsoil or a mixture approved by Engineer.

2.05 STAKES AND EARTH ANCHORS (When Required)

- A. Stakes required for staking plants shall be in accordance with Iowa DOT Article 4154.09 steel posts, "T" or "U" shaped of minimum 6 foot length. All stakes shall be uniform in shape, size, and color.
- B. Earth anchors shall be minimum 24 inch in length, auger type with looped end, painted uniform in color.

2.06 STAKING AND GUYING HOSE

- A. Reinforced garden hose not less than 1/2 inch inside diameter or fabric straps or other material approved by Engineer.
- B. Hose length shall be adequate to prevent contact of staking or guying wire with bark of tree trunk.

2.07 STAKING WIRE AND GUYING CABLE (for Trees over 4 inch Diameter)

- A. **Wire:** No. 14 gauge pliable galvanized wire.
- B. **Cable:** 3/16 inch aircraft cable with ends clean and unfrayed.
- C. **Cable Clamps:** Cable clamps to match size and strength of cable. Provide 2 for each end of cable.
- D. **Turnbuckle:** Turnbuckle to match size of cable with one end looped and the other end hooked to fit anchor.

2.08 TREE WRAPPING (For Winter Protection)

Tree Trunk Wrapping Material: 4 inch rolls of bituminous impregnated tape, corrugated or crepe paper, specifically manufactured for tree trunk wrapping, having qualities to resist insect infestation, or similar material approved by the Engineer.

2.09 WATER

- A. Water: Free of substances harmful to plant growth.
- B. Contractor to provide water, equipment, methods of transportation, water tanker, hoses, sprinklers, and the application of water.
- C. Water plants immediately after planting with at least 10 gallons of water.

2.10 TREE GUARDS AND TREE GRATES

Tree guards and tree grates shall be furnished and installed as specified on the plans and Standard Detail Plates.

PART 3 - EXECUTION**3.01 OPTIMAL PLANTING SEASONS**

- A. Evergreen Plants (B&B and Container): Planting period shall be from September 1 to October 15 and from April 1 to June 1.
- B. Deciduous plants (B&B and Container): Planting period shall be from August 15 to November 15 and spring planting prior to June 1.
- C. Deciduous bare root plants shall be planted in the spring only prior to May 15.
- D. At the option and on the full responsibility of the Contractor, planting may be conducted under unseasonable conditions, except in weather below 32° F. or above 90° F. without additional compensation nor variance from plant guarantee survival.

3.02 PREPARATION

- A. Provide notice and obtain approval from Engineer 3 days prior to planting operations.
- B. Provide barriers or fencing as approved by Engineer to protect the general public from injury when planting installation is within street right-of-way.

3.03 LOCATION OF PLANTS

- A. Engineer to provide approval of location marking by Contractor prior to excavation of planting wells for all plants.
- B. Contractor to mark with flags or lathe the location of all plants in accordance with the plans. Trees are to be marked individually. Stake the outline of bedded plants or shrub groups for the quantity on the plans without marking individual plants.
- C. Make field adjustments in plant locations where underground or overhead obstruction is encountered, or where changes have been made in construction as approved by the Engineer.

3.04 EXCAVATION OF PLANTING PIT

- A. Excavate the plant pit, centered at the location marks, cylindrical in shape with a diameter 1 1/2 to 2 times larger than ball or root condition, with vertical sides and flat or saucer-shaped bottom. Excavate plant pit to a depth to match the nursery grade of the root crown for all balled and container root systems. Excavate plant pit to a depth 6 inches deeper for bare-rooted systems.
- B. Scarify sides of excavated pit.
- C. Following excavation of planting pit for all trees, fill pit full of water; allow to stand (without adding water) for an 18 hour period to determine porosity of the soil.
- D. If determined by the Engineer the soils are too impervious, a planting well is to be provided as an additional work item.
 - 1. Planting Well Location: Over-excavate planting pit as required to locate planting well in the bottom of the planting pit to an adjacent side of the plant root system, as per detail.
 - 2. Planting Well: Auger a minimum 9 inch diameter hole to a minimum 6 foot depth and fill with clean 3/4 inch septic rock. Cover planting well aggregate with approved fiberglass screen.

3.05 PLANTING**A. Bare Root Plants:**

1. All bare root plants to be dormant at time of planting.
2. Remove all ties, ribbons, and wrap and other items except plant identification from branch system after approval from Engineer.
3. Remove all root packing and prune broken roots to sound wood with clean cuts.
4. Place a minimum of 6 inch depth of planting soil in bottom of planting pit.
5. Place plant erect, centered, and with desired orientation in planting pit and backfill with planting soil; with the root crown matching existing grade.
6. Spread and arrange roots in their natural position. Do not mat roots together.
7. Carefully compact backfill in layers filling all voids and avoiding injury to root system until two-thirds of plant pit is complete; apply water to fill pit and allow soil to settle.
8. Compact lightly the settled topsoil.
9. Continue backfilling and form a 3 inch depth saucer around plant, as detailed on plans.
10. Water plant and surrounding area until backfill is thoroughly moist.

B. Balled and Burlapped and Container Plants:

1. All container and balled root systems to be moist at time of planting.
2. Remove all ties and wrap from branch system, except plant identification.
3. Remove plant root system carefully from container prior to planting without disturbance to root systems.
4. Place plants centered, erect, and with desired orientation in planting pit with the root crown matching existing grade.
5. After plant placement, cut twine, wire, wire mesh, and burlap and fold from sides of ball and remove from pit.
6. After placement, remove sides of wooden baskets from pit.
7. Carefully compact planting soil backfill in layers, filling all voids until two-thirds of plant pit is complete; apply water from above to allow soil to settle.
8. Compact lightly the settled topsoil.
9. Continue backfilling and form a 3 inch depth saucer around plant, as detailed on plans.
10. Water plant and surrounding area until backfill is thoroughly moist.

3.05 PLANTING (Continued)**C. Planting on Slopes:**

1. Place the top of the root crown at or slightly above the finished grade at the center of the planting pit.
2. For all plants planted on significant slope, form a saucer as a dam or shoulder on the downhill side to catch and hold water and to avoid erosion, as detailed.

3.06 MULCHING

- A. Place mulch 3 inches deep in the planting saucer within 4 calendar days of planting. Do not place mulch on trunk.
- B. Provide a minimum of 18 inch radius mulch area from tree trunks and shrub branch lines.
- C. Provide a continuous mulch area around plant groupings.
- D. Thoroughly water mulched areas. Rake to a smooth finish surface.

3.07 WRAPPING (Fall Only for Winter Protection When Required)

- A. Provide a trunk wrapping for all deciduous trees.
- B. Inspect trunk for injuries and evidence of insect infestation. Repair and treat as approved by the Engineer.
- C. Wrap trunks spirally from ground line by overlapping one-half of the tree wrap strip and completely cover trunk to the height of the first branch.
- D. Secure wrap with twine wound spirally downward in opposite direction, with ties around tree in at least three places in addition to top and bottom.
- E. Provide written instructions on maintenance of wrap and when to remove.
- F. Trees shall be wrapped by November 1 and wrapping removed by April 1.

3.08 STAKING AND GUYING (When Required)

- A. The Contractor is required to maintain all plants in an upright, plumb condition.
- B. Staking or guying shall be completed by end of day for all single stem plants over 1 inch caliper planted.
- C. Clump form plants and plants in Class "A" walks or other paved pedestrian areas will not be staked unless approved by Engineer.
- D. Locate stakes uniformly from trunk of plant equal to 1/2 the distance between the securing collar and grade.
- E. Set posts vertically into unexcavated soil at a minimum 2 foot depth or until firm providing a required post height above grade.
- F. Secure with fabric webbing or wire in rubber hose a minimum of 4 feet above grade or between one-half to two-thirds distance from grade to tree top, around trunk from each stake, with a slight tension.

3.08 STAKING AND GUYING (When Required) (Continued)

- G. Provide 3 stakes for trees, as detailed. Locate stakes equally spaced around plant with one stake located to the southwest of the plant or as directed by the Engineer.
- H. Provide 3 earth anchors and cable guying assemblies for evergreen trees 10 foot and taller and deciduous trees over 4 inch caliper, as detailed.
 - 1. Locate one anchor to the southwest of tree with all anchors equally spaced.
 - 2. Locate anchor from trunk at 2/3 distance of tree height.
 - 3. Attach cable with hose protector to trunk between 1/3 and 1/2 of tree height.
 - 4. Screw anchor into unexcavated soil until only the looped top is exposed.
 - 5. Secure cable and turn buckle to anchor snugly; flag all anchor cables as approved by Engineer.
- I. Remove all staking and anchoring materials from all plants at the end of the warranty period and remove from site.

3.09 PRUNING

- A. Deciduous Trees:
 - 1. Prune broken, damaged, or otherwise defective branches. All branches which may not develop properly shall be removed. Narrow crotches or competing leaders shall also be eliminated.
 - 2. Prune to develop an upright leader which will promote the symmetry of the tree. Flowering or specimen trees shall be pruned to develop their natural form.
 - 3. Prune all trees in Class "A" walks or other paved pedestrian areas to provide a 7 foot height clearance, unless otherwise directed by the Engineer.
- B. Contractor to provide proper and sharp pruning tools to provide a clean cut.
- C. Plant materials incorrectly pruned will be rejected.
- D. All pruning shall be done to retain the natural shape of the plant. Do not prune terminal leader of a plant.
- E. All cuts shall be made so as not to injure the branch collar. Leave no protruding stubs or prune to the closest outward growing bud.

3.10 CLEANUP

- A. Perform cleaning during installation of work and upon completion of work.
- B. Remove from site all excess materials, trimmings, branches, soils, debris, and equipment.
- C. Repair any damage resulting from planting operations.
- D. All paved areas to be broom cleaned.
- E. Remove all tags and labels from plants following acceptance.

3.11 ACCEPTANCE AND REVIEW

- A. A review of the plants and installation to determine completion of contract work will be made by the Engineer.
- B. Contractor to provide notification at least 5 days before requested review by the Engineer.
- C. After the plant and installation review, a listing of acceptance, deficiencies, incomplete work, and requirements for completion of work will be provided to the Contractor.
- D. Maintain plants, mulch areas, staking, and guying as specified until corrections or completion of work is approved in the final review.
- E. All plants shall be in a live and healthy condition, of the specified variety and size, and all requirements and maintenance have been complied with. Any plant that is dead or not in a vigorous, thriving condition shall be removed and replaced.
- F. Mulched areas are to be free of weeds and grasses.
- G. Plants that are missing are to be installed during the specified planting season.
- H. Replacement of rejected or missing plants before acceptance shall not be considered fulfillment of the warranty.
- I. Contact Engineer prior to planting replacement plants for inspection and approval of plants and to verify location.
- J. The warranty period for all plants shall begin upon date of acceptance for completed installations.

END OF SECTION