

SECTION 02950

TREES, PLANTS, AND GROUND COVERS

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Planting required for the Work is indicated on the Drawings and, in general, includes planting of trees and shrubs throughout the Work including furnishing all materials, equipment, and labor necessary for root protection, and tree guards where applicable.

1.02 QUALITY ASSURANCE

- A. Qualifications of Workmen: Provide at least one person who shall be present at all times during execution of this portion of the Work, thoroughly familiar with the type of materials being installed and the best methods of their installation, and direct all work performed under this Section.
- B. Standards:
 - 1. Plants and planting material shall meet or exceed the specifications of Federal and State laws requiring inspection for plant disease and insect control.
 - 2. Quality and size shall conform with the current edition of "Horticultural Standards" for number one grade nursery stock, as adopted by the American Association of Nurserymen.
 - 3. Plants shall be true to name and one of each bundle or lot shall be tagged with the name and size of the plants, in accordance with the standards of practice of the American Association of Nurserymen. Botanical names shall take precedence over common names.
 - 4. Substitutions:
 - a. In the event that trees, shrubs, or other plant material specified in the drawings are in the opinion of the Contractor, impossible or unreasonably difficult to obtain, the Contractor shall immediately notify the Owner's Representative to discuss appropriate substitutions in writing. No substitutions of plant material may be made without the prior written approval of the Owner's Representative.
 - b. Contractor shall notify the Owner's Representative in writing of any plant material that is inappropriate for the proposed site conditions in the opinion of the Contractor. Substitutions shall be processed as per paragraph 4a. above.

1.03 SUBMITTALS

- A. Materials List: Thirty days before any planting materials are delivered to the job site, submit to the Architect a complete list of plants and other items proposed to be installed:
 - 1. Include a complete data on source, size and quality.
 - 2. Demonstrate complete conformance with the requirements of this section.
 - 3. This shall in no way be construed as permitting substitution for specific items described in the Drawings or these Specifications, unless the substitution has been approved in advance by the Architect.
- B. Record Drawings: During the course of the installation, carefully record, in red line, changes made to the planting system layout during installation on a print of the planting Drawings.
- C. Certificates:
 - 1. Certificates required by law shall accompany shipments.
 - 2. Upon completion of the installation, deliver certificates to the Architect.
- D. Contractor shall submit sample of shredded bark mulch to be used for Architect approval prior to delivery to site.

1.04 PRODUCT HANDLING

- A. Delivery and Storage:
1. Deliver items to the site in their original containers with labels intact and legible at time of Architect's inspection.
 2. Immediately remove from the site plants which are not true to name and materials which do not comply with the provisions of this Section of these Specifications.
 3. Protect plant materials before, during and after installation and to protect the installed work and materials of other trades.
 4. Provide container grown or freshly dug plant materials. Plant materials which have been in cold storage or heeled-in may be rejected. Do not bend or bind-tie trees or shrubs in such manner as to damage bark, break branches or destroy natural shape. Provide protective covering during delivery.
- B. Replacements: In the event of damage or rejection, immediately make repairs and replacements necessary to the approval of the Architect, at no additional cost to the Owner.

PART 2 - PRODUCTS

2.01 PLANTING SOIL

- A. Shall Be a Natural Fertile, Friable Natural Loam of The Following Types: Sandy loam, clay loam, loam, silt loam, sandy dry loam or other soil approved by Owner's representatives. Soil shall contain from 6 to 20 percent organic matter as determined by the Organic Carbon, 6A, Chemical Analysis Method. Topsoil shall be tested by a recognized laboratory for pH and soluble salts. A pH of between 5 and 7.5 is required and shall not contain soluble salts greater than 500 parts per million. It shall be obtained from naturally well-drained areas. It shall not contain toxic substances which may be harmful to plant growth. Topsoil shall be without admixture of subsoil and shall be cleaned and reasonably free from clay lumps, stones, stumps, roots, or similar substances over 1" in diameter, debris, or other objects which might be a hindrance to planting operations. Soil shall not be used for planting while in a frozen or muddy condition.

2.02 MANURE

- A. Well rotted, unleached, stable or cattle manure which is reasonably free of wood shavings, sawdust or other undesirable liter and contains no chemical or other ingredients harmful to plants.

2.03 COMMERCIAL FERTILIZER

- A. Complete fertilizer with minimum analysis of 10%N, 8%P, 4%K and shall conform to the applicable State fertilizer laws. It shall be uniform in composition, dry and free flowing, and shall be delivered to the site in the original, unopened containers, each bearing the manufacturer's guaranteed analysis. Fertilizer which becomes caked or otherwise damaged, making it unsuitable for use, will not be accepted.

2.04 SOIL AMENDMENT

- A. Shall be peat; a domestic product consisting of partially decomposed vegetable matter of natural occurrence. It shall be brown, clean, low in content of mineral and woody material, mildly acid and granulated or shredded and fortified with organic nitrogen, or an equal commercial soil amendment approved in advance by Architect.

2.05 MOSS PEAT

- A. Brown; acid reaction about 4 to 5 pH; low in content of wood material and free of mineral matter harmful to plant life; water absorbing capacity, 1100 to 2000 percent; moisture content 30 percent natural, shredded or granulated.

2.06 WATER

- A. Contractor shall make, at his expense, whatever arrangements may be necessary to ensure an adequate supply of water to meet the needs of this contract. He shall also furnish necessary hose, equipment, attachments, and accessories for the adequate irrigation of lawns and planted areas as may be required to complete the work as specified.

2.07 BARK MULCH

- A. Shredded bark mulch shall be uniform in size, free of chunks and pieces of wood thicker than 1/4" or longer than 4" and approved by Architect. Mulch must be partially decomposed and of a consistent dark brown color.

2.08 PLANT MATERIALS

- A. Plant materials shall be true to species and variety specified and shall be nursery grown in accordance with good horticultural practice under climatic conditions similar to those in the locality of the project for at least two years. They shall have been root-pruned within the last two years and shall be freshly dug. No heeled-in plants or plants from cold storage will be accepted.
- B. Unless specifically noted otherwise, plants shall be of specimen quality; exceptionally heavy; and symmetrical, so trained or favored in development and appearance as to be unquestionable and outstandingly superior in form, compactness and symmetry. They shall be sound; healthy; vigorous; well-branched and densely foliated when in leaf; free of disease; insects; eggs or larvae; and shall be free from physical damage or conditions that would prevent thriving growth.
- C. Plants shall not be pruned before delivery. Trees with multiple leaders, unless specified, will be rejected. Trees with a damaged or crooked leader, abrasion of bark, sunscalds, disfiguring knots, insect damage, or cuts of limbs over 3/4" in diameter, not completely calloused, will be rejected.
- D. Plants shall conform to measurements specified in the Plant Lists, except that plants larger than specified may be used if approved by the Architect. Use of such plants shall not increase the Contract price. If larger plants are approved, the root ball shall be increased in proportion to the size of the plant.
- E. Caliper measurement shall be taken on the trunk 6" above natural ground line for trees up to 4" in caliper and 12" above the natural ground line for trees over 4" in caliper. Height and spread dimensions specified refer to the main body of the plant and not from branch tip to tip. Plants shall be measured when branches are in their normal position. If a range of size is given, no plant shall be less than the minimum size, and not less than 50 percent of the plants shall be as large as the maximum size specified. Measurements specified are minimum size, acceptable after pruning where pruning is required. Plants that meet measurements but do not possess a normal balance between height and spread shall be rejected.
- F. Plants shall be labeled with correct plant name and size. Labels shall be attached securely to all plants, bundles and containers of plant materials delivered with care that those attached directly to plants will not restrict growth.
- G. Substitutions of plant materials will not be permitted, unless authorized in writing by the Architect. If proof is submitted and substantiated in writing that any plant specified is not obtainable, a proposal will be considered for use of the nearest available size or similar variety with a corresponding adjustment of Contract price.

H. Type of Protection to Roots:

1. Balled and Burlapped Plants: Plants designated "B&B" in the Plant List shall be balled and burlapped. They shall be dug with firm, natural balls of earth of sufficient diameter and depth to encompass the fibrous and feeding root system necessary for full recovery of the plant. Balls shall be firmly wrapped with burlap or similar material and bound with twine, cord, or wire mesh. Where necessary to prevent breaking or cracking of the ball during the process of planting, the ball may be secured to a platform.
2. Bare-Root Plants: Plant designated "bare-root" in the Plant List shall be dug and the earth removed without injury to the fibrous root system necessary for the full recovery of the plant. Roots shall be covered with a thick coating of mud by puddling or wrapped in wet straw, moss, or other suitable packing material immediately after they are dug, for protection until delivered.
3. Protection After Delivery: The balls of "B&B" plants which cannot be planted immediately on delivery shall be covered with moist soil or mulch, or other protection from drying winds and sun. Bare-rooted plants shall be planted or heeled-in immediately upon delivery. Plants shall be watered as necessary until planted.

2.09 INSPECTIONS

- A. Certificates of inspection shall accompany invoices for plants as may be required by law for transportation. File certificates with the Architect prior to acceptance of the material. Inspection by Federal or State Governments at place of growth does not preclude rejection of plants at the work site.

2.10 SELECTION AND TAGGING

- A. Plants shall be subject to inspection and approval by the Architect at their place of growth and upon delivery for conformity to specification requirement. Such approval shall not impair the right of inspection and rejection during the progress of the work. A Contractor's representative shall be present at inspections.
- B. Written requests for inspection of plant material at their place of growth shall be submitted to the Architect at least 10 calendar days prior to digging. Written requests shall state the place of growth and quantity of plants to be inspected. The Architect may refuse inspection at this time if, in his judgement, a sufficient quantity of plants are not available for inspection.
- C. Plants identified as "selection specimen" shall be approved and tagged at their place of growth. For distant material, submit photographs for pre-inspection review.

2.11 PLANT LABELS

- A. Plant labels shall be durable, legible stating the correct plant name and size in weather-resistant ink or embossed process lettering.

2.12 GUYING, STAKING AND WRAPPING MATERIALS

- A. Ground anchors shall be castings, stamped steel, or deadmen of wood or other material approved by the Architect. Width across top span and length, exclusive of pin from top to arrowed tip, shall conform to the following list. Assemblies for anchors shall also conform to the following list:
Tree Caliper: 2 - 5 inches
Type: wire
Capacity: 3,500 lbs.

- B. Guying cable shall be five strand, 3/16" diameter galvanized steel cable. Turnbuckles shall be galvanized or dip-painted, having a 3" minimum lengthwise opening fitted with screw eyes. Eyebolts shall be galvanized, having a 1" opening fitted with screw length of 1". Hose shall be suitable lengths of two-ply, reinforced, black rubber hose, 3/4" in diameter.
- C. Stakes for supporting trees shall be 2 inches square or 2-1/2" round, by 8 feet sound wood, treated for one-half their length with creosote or equal.
- D. Wrapping material for tree trunks, shall be standard burlap, heavy crepe paper, or other suitable material, in strips 6 to 10 inches wide.

2.13 ANTI-DESICCANT

- A. Anti-desiccant shall be an emulsion which provides a protective film over plant surface, permeable enough to permit transpiration. It shall be delivered in containers of the manufacturer and mixed according to the manufacturer's directions ("Wiltpruf" manufactured by Nursery Specialty Products Inc., Stubbings Road, Groton Falls, New York, or approved equal.)

PART 3 - EXECUTION

3.01 SITE CONDITIONS

- A. Contractor must examine the subgrade, observe the conditions under which work is to be performed, and notify the Owner's Representative of unsatisfactory conditions. Do not proceed with the work until unsatisfactory conditions have been corrected in a manner acceptable to the Owner's Representative and the Contractor. Commencement of work by Contractor shall signify Contractor's acceptance of conditions as satisfactory.
- B. Determine location of underground utilities and perform work in a manner which will avoid possible damage. If necessary, call Dig-Safe at 800-225-4977 (in ME, NH, VT, RI) or 800-322-4844 (in MA). Hand excavate, as required, to minimize possibility of damage to underground utilities. Maintain grade stakes set by others unless removal is mutually agreed upon by all parties concerned.
- C. Owner's Representative shall be contacted in the event that rock, underground construction work, adverse drainage conditions, or other obstructions are encountered in any plant pit or excavation work as specified in this contract. Alternate locations may be selected by the Owner's Representative at no additional cost to the Owner provided that work has not been initiated. Additional charges incurred by concealed contingencies shall be set at a standard time and materials rate agreed upon by both parties prior to initiation of contract.
- D. Where locations cannot be changed, the obstruction shall be removed, or altered, subject to the Owner's Representative's written authorization, to a depth of not greater than 3 feet below grade, or no less than 6 inches below bottom of ball or roots when plant is properly set at the required grade. Contractor shall be paid extra as defined above.

3.02 PLANTING TIME

- A. Planting Shall Be Done with the Following Dates: April 1st to November 15th.
- B. Coordination with Lawns: Plant trees and shrubs after final grades are established and prior to planting of lawns, unless otherwise acceptable to the Owner's Representative. If planting of trees and shrubs occurs after lawn work, protect lawn areas and promptly repair damage to lawns resulting from planting operations.

3.03 EXCAVATION OF PLANTING AREAS

- A. Stake out the ground locations for plants and outlines of planting beds and obtain approval of the Landscape Architect before excavation is begun. A minimum of 30 percent of total planting must be staked before inspection will be made. Locations as shown on drawings are approximate. Final positioning of plant material shall be made under supervision of Landscape Architect.
- B. Excavate tree and shrub pits as shown on Drawings.
- C. Separate subgrade soils from the upper topsoil portions and remove immediately wherever encountered during planting operations.
- D. Notify the Architect in writing of soil or drainage conditions which the Contractor considers detrimental to growth of plant material. State condition and submit proposal in writing to the Architect for correcting condition.
- E. Test drainage of suspect plant beds and pits by filling with water twice in succession. Conditions permitting the retention of water in planting beds for more than 12 hours shall be brought to the attention of the Architect.
- F. No planting except ground cover and vines shall be placed closer than 2 feet to pavement or structures.

3.04 PLANTING OPERATIONS

- A. Digging and Handling of Plant Materials to be Relocated: Plants shall not be bound with wire or rope at any time so as to damage the bark or break branches. Plants shall be lifted and handled from the bottom of the ball only. In addition to procedure listed below, amend planting soil with a root growth stimulator containing mycorrhiza (M-Roots with mycorrhiza, Root & Gro, or approved equal) in quantities as recommended by manufacturer.
- B. Planting Trees and Shrubs:
 1. Excavate pits in accordance with Typical Planting Details with vertical sides and scarify sides of pit to insure against glazing.
 2. Protect plants from sun or drying winds. Plants that cannot be planted immediately on delivery shall be kept in the shade, well protected with soil, wet moss, or other acceptable material and shall be kept well watered. Plants shall not be bound with wire or rope at any time so as to damage the bark or break branches. Plants shall be lifted and handled from the bottom of the ball only.
 3. Set plants at same relationship to finished grade as they bore to the ground from which they were dug. Set plant plumb and brace rigidly in position until prepared topsoil has been tamped solidly around ball and roots.
 4. Cut and remove ropes, strings and wrappings from top 1/3 of ball after plant has been set. Leave balance of wrappings intact around ball. If wrapping is plastic, remove top 2/3.
 5. Backfill plant pits with prepared planting soil. When plant pits have been backfilled approximately 2/3 full, water thoroughly, eliminating air pockets. After watering, install planting soil to top of pit and repeat watering.
 6. Form shallow saucer around tree as indicated on the Drawings.
 7. Finish grade planting areas to conform to grades on Drawings.
 8. Mulch all pits and beds with a 4" layer of approved shredded bark mulch immediately after planting.
 9. Immediately after planting, water plants thoroughly.
- C. Guying, Staking, Wrapping and Pruning:
 1. Stake or guy a tree only when necessary for the specific conditions encountered and with the approval of the landscape architect. Staking may be required in unusual circumstances such as sandy soils in either the root ball or adjacent soils or in extremely windy locations. Poor-quality trees with cracked, wet, or loose root balls, poorly developed trunk-to-crown ratios, or undersized

root balls shall be rejected if they require staking, unless written approval to permit staking or guying as a remedial treatment is obtained from the landscape architect. Trees that settle out of plumb due to inadequate soil compaction either under or adjacent to the root ball shall be excavated and reset. In no case shall trees that have settled out of plumb be pulled upright using guy wires.

2. Guying shall be completed immediately after planting. Drive ground anchors into ground by manual or machine method at approximately 45 degree angle to ground plane and distributed at 120 degree intervals around trunk of tree. Preload anchors after driving until anchor turns in the ground at 90 degree angle to line of driving force. Anchor assembly will rise 2 to 6 inches during pre-loading. Attach guying cables, turnbuckles and hose, and secure until tree is rigidly guyed. On all guys, 1/3 distance up from ground to trunk, secure white plastic flagging 1" wide x 18", tied securely
 - a. Trees 3" in caliper or greater shall be guyed using the 120 degree, three-guy method, or as shown on the Drawings.
 - b. Trees less than 3" in caliper shall be staked using the 180 degree, two-stake method.
 - c. Maintain supports in place during entire guarantee period.
3. Wrap the trunk of any tree only when necessary for the specific conditions encountered and with the approval of the landscape architect. Wrapping may be required for thin-barked species in unusual circumstances such as trees planted adjacent to South- or West-facing reflective surfaces, or when it is impossible to plant the tree with the trunk oriented to the same north orientation that it held in the growing nursery.
4. Wrap trunks of deciduous trees of 1-1/2" or more caliper with a spiral overlapping wrapping to minimum height of third branch. Wrap from bottom and tie-wrapping securely in place. Remove wrapping at end of guarantee period.
5. Prune plants only at time of planting and according to standard horticultural practice to preserve the natural character of the plant. Pruning to be done under supervision of the Project Architect. Pruning and trimming shall include the following:
 - a. Remove dead wood, suckers, and broken or badly bruised branches. Contractor shall not cut main leader of tree. Required shrub sizes are the sizes after pruning.
 - b. Use only clean sharp tools.
 - c. Paint cuts over 3/4" diameter, covering all exposed, living tissue.

3.05 MAINTENANCE OF TREES AND SHRUBS

- A. Maintenance shall begin immediately after each plant is planted and shall continue until Project Substantial Completion or 60 days, whichever is longer.
- B. Maintenance shall consist of pruning, watering, cultivating, weeding, mulching, tightening and repairing guys, resetting plants to proper grades or upright position, restoration of the planting saucer, and furnishing and applying such sprays or other items as are necessary to keep the planting free of insects and disease and in thriving condition.
- C. Planting areas and plants shall be protected against trespassing and damage for the duration of the maintenance period. If plants become damaged or injured, they shall be treated or replaced as directed by the Architect at no additional cost to the Owner.
- D. Provide equipment and means for proper application of water to those planted areas not equipped with an irrigation system.
- E. Restoration: Pavements, sodded and planted areas, structures and substructures not specifically

provided for in the contract, disturbed by the Contractor during the execution of the work shall be restored by the Contractor, in a manner satisfactory to the Owner's Representative, to their original condition at no cost to the Owner.

3.06 INSPECTION

- A. In Addition to Normal Progress Inspection, Schedule and Conduct the Following Formal Inspections, Giving the Architect at Least 3 Working Days Prior Notice of Readiness for Inspection:
1. Inspection of plants in containers prior to planting.
 2. Inspection of plant locations to verify compliance with the Drawings.
 3. Schedule the inspection for Project Substantial Completion sufficiently in advance and in cooperation with the Architect so that the final inspection may be conducted within one week after completion of planting.

3.07 GUARANTEE PERIOD AND REPLACEMENTS

- A. The guarantee period for trees and shrubs shall begin at the date of Project Substantial Completion.
- B. Plant material shall be guaranteed by the Contractor for a period of one year from the date of Project Substantial Completion to be in good, healthy and flourishing condition.
- C. When work is accepted in parts, the guarantee periods extend from each of the partial acceptances to the terminal date of the last guarantee period. Thus, all guarantee periods terminate at one time.
- D. The Contractor shall replace, without cost to the Owner and as soon as possible, as weather conditions permit and within a specified planting period, dead plants and plants not in a vigorous thriving condition, as determined by the Architect during and at the end of the guarantee period. Plants shall be free of dead or dying branches and branch tips and shall bear foliage of a normal density, size and color. Replacements shall closely match adjacent specimens of the same species. Replacements shall be subject to the requirements stated in this Specification. Replacements required because of vandalism or other causes beyond control of the Contractor are not part of the Contract.
- E. The guarantee of replacement plants shall extend for an additional period of one year from the date of their acceptance after replacement. In the event that a replacement plant is not acceptable during or at the end of the said extended guarantee period, the Owner may elect subsequent replacement or credit for each item.
- F. The Contractor shall make periodic inspection at no extra cost to the Owner during the guarantee period to determine what changes, if any, should be made to the Owner's maintenance program. Submit in writing to the Architect recommended changes.

3.08 CARE OF EXISTING TREES

- A. Upon completion of the work under this Section, existing trees within the work limits, unless indicated otherwise, shall be pruned and injuries repaired. The amount of pruning shall be limited to the minimum necessary to remove dead or injured twigs and branches and to compensate for the loss of roots as a result of construction operations. Roots greater than 2" shall be hand-cut to provide clean, concise, cutting and removal. Pruning shall be done in such a manner as not to change the natural habit or shape of the plant. Cuts shall be made flush, leaving no stubs. On cuts over 3/4" diameter and bruises or scars on the bark, the injured cambium shall be traced back to living tissue and removed; wounds shall be smoothed and shaped so as not to retain water, and the treated area shall be coated with an approved tree paint.

3.09 CLEAN-UP

- A. When of this work is done while buildings are occupied, pavements shall be kept clear, broom cleaned to prevent tracking dirt into buildings.

- B. After completion of planting operations, dispose of debris and excess material to the satisfaction of the Architect. Pavements shall be broomed and hosed clean.

3.10 FINAL INSPECTION AND ACCEPTANCE

- A. At the end of the guarantee period, the Architect will inspect guaranteed work for final acceptance upon written request of the Contractor. The request shall be received at least 10 calendar days before the anticipated date for final inspection.
- B. Upon completion and reinspection of repairs or renewals necessary in the judgement of the Architect at that time, the Architect will certify in writing to the Contractor as to the final acceptance of the Planting.

END OF SECTION

