Stormwater Improvements

Rumney Memorial School

Issue for Bid Specifications

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Landscape Architect

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SECTION 02231

TREE PROTECTION AND TRIMMING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.02 SUMMARY

A. This Section includes the protection and trimming of trees that interfere with, or are affected by, execution of the Work, whether temporary or new construction.

B. Related Sections include the following:
1. Sections for building and utility trench excavation, backfilling, compacting and grading requirements, and soil materials.

1.03 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Qualification Data: For firms and persons specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.

C. Certification: From a qualified arborist that trees indicated to remain have been protected during construction according to recognized standards and that trees were promptly and properly treated and repaired when damaged.

D. Maintenance Recommendations: From a qualified arborist for care and protection of trees affected by construction during and after completing the Work.

1.04 QUALITY ASSURANCE

A. Tree Service Qualifications: An experienced tree service firm that has successfully completed tree protection and trimming work similar to that required for this Project and that will assign an experienced, qualified arborist to Project site on a full-time basis during execution of the Work.

B. Arborist Qualifications: An arborist certified by the International Society of Arboriculture or licensed in the jurisdiction where Project is located.

C. Tree Pruning Standards: Comply with ANSI A300, "Trees, Shrubs, and Other Woody Plant Maintenance--Standard Practices," unless more stringent requirements are indicated.

D. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Meetings."
1. Before starting tree protection and trimming, meet with representatives of authorities having jurisdiction, Owner, Landscape Architect, and other concerned entities. Review tree protection and trimming procedures and responsibilities. Notify participants at least

three working days before convening conference. Record discussions and agreements and furnish a copy to each participant.

PART 2 – PRODUCTS

2.01 MATERIALS

A. Drainage Fill: Selected crushed stone, or crushed or uncrushed gravel, washed, ASTM D 448, Size 24, with 90 to 100 percent passing a 2-1/2-inch sieve and not more than 10 percent passing a 3/4-inch sieve.

B. Topsoil: Fertile, friable, surface soil, containing natural loam and complying with ASTM D 5268. Provide topsoil that is free of stones larger than 1 inch in any dimension and free of other extraneous or toxic matter harmful to plant growth. Obtain topsoil only from well-drained sites where soil occurs in depth of 4 inches or more; do not obtain from bogs or marshes.

C. Filter Fabric: Manufacturer's standard, nonwoven, pervious, geotextile fabric of polypropylene, nylon, or polyester fibers.

D. Chain Link Fence: Metallic-coated steel chain link fence fabric, 0.120-inch- diameter wire size; 48 inches high, minimum; line posts, 1.9 inches in diameter; terminal and corner posts, 2-3/8 inches in diameter; top rail, 1-5/8 inches in diameter; bottom tension wire, 0.177 inch in diameter; with tie wires, hog ring ties, and other accessories for a complete fence system.

PART 3 – EXECUTION

3.01 PREPARATION

A. Temporary Fencing: Install temporary fencing located as indicated or outside the drip line of trees to protect remaining vegetation from construction damage.
   1. Install chain link fence according to ASTM F 567 and manufacturer's written instructions.

B. Protect tree root systems from damage due to noxious materials caused by runoff or spillage while mixing, placing, or storing construction materials. Protect root systems from flooding, eroding, or excessive wetting caused by dewatering operations.

C. Do not store construction materials, debris, or excavated material within the drip line of remaining trees. Do not permit vehicles or foot traffic within the drip line; prevent soil compaction over root systems.

D. Do not allow fires under or adjacent to remaining trees or other plants.

3.02 EXCAVATION

A. Install shoring or other protective support systems to minimize sloping or benching of excavations.

B. Do not excavate within drip line of trees, unless otherwise indicated.

C. Where excavation for new construction is required within drip line of trees, hand clear and excavate to minimize damage to root systems. Use narrow-tine spading forks and comb soil to

expose roots. This task must be performed by an experienced tree service firm that has successfully completed root pruning, trimming and other work similar to that required for this Project.

1. Relocate roots in backfill areas where possible. If encountering large, main lateral roots, expose roots beyond excavation limits as required to bend and relocate them without breaking. If encountered immediately adjacent to location of new construction and relocation is not practical, cut roots approximately 3 inches back from new construction.
2. Do not allow exposed roots to dry out before placing permanent backfill. Provide temporary earth cover or pack with peat moss and wrap with burlap. Water and maintain in a moist condition. Temporarily support and protect roots from damage until they are permanently relocated and covered with soil.

D. Where utility trenches are required within drip line of trees, tunnel under or around roots by drilling, auger boring, pipe jacking, or digging by hand.

1. Root Pruning: Do not cut main lateral roots or taproots; cut only smaller roots that interfere with installation of utilities. Cut roots with sharp pruning instruments; do not break or chop.

3.03 REGRADING

A. Grade Lowering: Where new finish grade is indicated below existing grade around trees, slope grade beyond drip line of trees. Maintain existing grades within drip line of trees.

B. Grade Lowering: Where new finish grade is indicated below existing grade around trees, slope grade away from trees as recommended by qualified arborist, unless otherwise indicated

1. Root Pruning: Prune tree roots exposed during grade lowering. Do not cut main lateral roots or taproots; cut only smaller roots. Cut roots with sharp pruning instruments; do not break or chop.

C. Minor Fill: Where existing grade is 6 inches or less below elevation of finish grade, fill with topsoil. Place topsoil in a single uncompacted layer and hand grade to required finish elevations.

D. Moderate Fill: Where existing grade is more than 6 inches, but less than 12 inches, below elevation of finish grade, place drainage fill, filter fabric, and topsoil on existing grade as follows:

1. Carefully place drainage fill against tree trunk approximately 2 inches above elevation of finish grade and extend not less than 18 inches from tree trunk on all sides. For balance of area within drip-line perimeter, place drainage fill up to 6 inches below elevation of grade.
2. Place filter fabric with edges overlapping 6 inches minimum.
3. Place fill layer of topsoil to finish grade. Do not compact drainage fill or topsoil. Hand grade to required finish elevations.

3.04 TREE PRUNING

A. Prune remaining trees affected by temporary and new construction.

B. Prune remaining trees to compensate for root loss caused by damaging or cutting root system. Provide subsequent maintenance during Contract period as recommended by qualified arborist.

C. Pruning Standards: Prune trees according to ANSI A300 as follows:

1. Type of Pruning: Crown cleaning.
2. Type of Pruning: Crown thinning.

3. Type of Pruning: Crown raising.
4. Type of Pruning: Crown reduction.
5. Type of Pruning: Vista pruning.
6. Type of Pruning: Crown restoration.

D. Cut branches with sharp pruning instruments; do not break or chop.

E. Chip branches removed from trees. Spread chips where indicated or as directed by Architect.

3.05 TREE REPAIR AND REPLACEMENT

A. Promptly repair trees damaged by construction operations within 24 hours. Treat damaged trunks, limbs, and roots according to written instructions of the qualified arborist.

B. Remove and replace dead and damaged trees that the qualified arborist determines to be incapable of restoring to a normal growth pattern.
1. Provide new trees of the same size and species as those being replaced; plant and maintain as specified in Division 2 Section "Trees and Shrubs."
2. Provide new trees of 6-inch caliper size and of a species selected by Architect when trees more than 6 inches in caliper size, measured 12 inches above grade, are required to be replaced.

C. Aerate surface soil, compacted during construction, 10 feet beyond drip line and no closer than 36 inches to tree trunk. Drill 2-inch- diameter holes a minimum of 12 inches deep at 24 inches o.c. Backfill holes with an equal mix of augured soil and sand.

3.06 DISPOSAL OF WASTE MATERIALS

A. Burning is not permitted.

B. Disposal: Remove excess excavated material, displaced trees, and excess chips from Owner's property.

END OF SECTION

SECTION 02772

SITE STONE WORK

PART 1 – GENERAL

1.01 SUMMARY

A. Extent of stonework is shown on drawings and in the schedules. The work includes but is not necessarily limited to furnishing and installing the following:

1. Landscape Boulders
2. Riverstone

1.02 SUBMITTALS

A. Samples: Landscape architect will be allowed to review boulder source to ensure the stone type and boulder sizes meet the design intent for the project. If the boulder source is too far away, the supplier can submit photographs and dimension of the boulders. Each photo shall have a person standing beside the boulder for sense of scale.

1.03 QUALITY ASSURANCE

A. Source Quality Control:
1. Obtain boulders from quarry with consistent color range and texture throughout the work.

1.04 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Handle boulders to prevent chipping, breakage, soiling or other damage. Do not use pinch or wrecking bars without protecting edges of stone with wood or other rigid materials. Lift with wide-belt type slings; do not use wire rope or ropes containing substances which might cause staining.

PART 2 - PRODUCTS

2.01 STONE

A. Landscape Boulders
1. Type: Boulders should be of native rock material.
2. Size: According to Landscape Architect's drawings.
3. Source: Hinesburg Sand and Gravel or approved equal.
4. **Landscape Architect shall approve selection of all boulders prior to installation.**
5. **Final placement of boulders shall be approved by Landscape Architect prior to final installation.**

B. Riverstone, Type A
1. Type: Washed Riverstone. Stone shall be completed washed, free of all silt prior to installation.
2. Size: 3-6" Stone
3. Source: Hinesburg Sand and Gravel or approved equal.
4. Landscape Architect shall approve selection of stone prior to installation.

C. Riverstone, Type B
1. Type: Washed Riverstone. Stone shall be completely washed, free of all silt prior to installation.
2. Size: 6" – 12" Stone.
3. Source: Hinesburg Sand and Gravel or approved equal.
4. Landscape Architect shall approve selection of stone prior to installation.

PART 3 - EXECUTION

3.01 PROTECTION

A. Provide final protection and maintain conditions which ensures stonework being without damage during subsequent construction and until time of substantial completion.

END OF SECTION

SECTION 02916

SOIL PREPARATION

PART 1 - GENERAL

1.01 DESCRIPTION

A. Related Requirements: Review the General Contract Conditions and Division One, General Requirements, which contain information and requirements that apply to this Section.

B. Work Included: Provide all products and execute all labor to achieve soil preparation, complete as shown and as specified.

C. Related Work in Other Sections:
Seeding - Section 02922
Trees, Shrubs and Groundcover - Section 02930
Landscape Maintenance - Section 02970

D. Work Under Another Contract:
Rough Grading

1.02 QUALITY ASSURANCE

A. Submit certificates of inspection required by law for transportation with invoice. File copies of certificates after acceptance of material.

B. Inspection by governmental officials at point of origin does not preclude rejection of materials at project site.

1.03 PROJECT CONDITIONS

A. Protection of Existing Plants to Remain: See Section 02930 - Trees, Shrubs and Groundcover.

1.04 SUBMITTALS

A. Samples and Product Data: Prior to delivery to site, submit samples and manufacturers' literature for the following items:

1. Organic Amendments
2. Topsoil
3. Soil Mixes
4. Sand
5. Chemical Additives

B. Test Data: Laboratory test data for each specified material.

1.05 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Labeling: Furnish standard products in unopened manufacturer's standard containers bearing original labels showing quantity, analysis and name of manufacturer.

B. Storage: Store products with protection from weather or other conditions which would damage or impair the effectiveness of the product.

1.06 ANALYSES OF SAMPLES AND TESTS

A. Sampling: Samples of materials may be taken and analyzed for conformity to specifications at any time. Furnish samples as requested.

B. Rejected Materials: Remove rejected materials immediately from the site at Contractor's expense.

C. Testing Agency: Pay cost of initial soil testing and of materials not meeting specifications.

1.07 SOIL ANALYSIS

A. Obtain an agricultural suitability analysis of all proposed soils to be used for this project from an accredited soils laboratory at the contractors cost. The analysis shall verify the suitability of the existing soils, analyze the existing soil texture, organic and chemical qualities and recommend additional soil amendments beyond those specified. Additional amendments recommended by the analysis beyond those specified shall be an additional cost. A minimum of three (3) samples shall be taken from the site. The soil amendments currently specified will be the minimum incorporated.

1.08 FINAL ACCEPTANCE

A. Acceptance: Work will not be accepted until satisfactory completion of all soil preparation work.

B. Notification: Give notification of completion of soil preparation prior to proceeding with planting operations.

PART 2 - PRODUCTS

2.01 TOPSOIL

A. General Qualifications:

1. Composition: Use as a planting medium for the project only fertile, friable, well-drained soil, of uniform quality, free of stones over 0.5 in. diameter, sticks, oils, chemicals, plaster, concrete, pests and infestations and other deleterious materials. Submit soil analysis as indicated above in 1.07 for import topsoil.

B. Areas to receive imported topsoil shall include backfill mix for trees and planter beds. All grass and planting areas shall be soil conditioned.

C. Imported Topsoil: Furnish imported topsoil from sources accepted by the Landscape Architect which meets the standards specified under "General Qualifications" above.

1. Verification: Quantity of topsoil to complete the work shall be calculated by the Contractor and included in their base bid price.
2. Analysis: Obtain an agricultural suitability analysis and soil texture analysis of the proposed topsoil from an accredited soils laboratory at Contractor's cost.
3. Acceptance: Submit soils analysis and recommendations to the Landscape Architect for acceptance. Amend topsoil per accepted soils analysis report.
4. Samples: The Landscape Architect reserves the right to take samples of the imported

topsoil delivered to the site for conformance to the Specifications.

5. Rejected Topsoil: Immediately remove rejected topsoil off the site at Contractor's expense.
6. Stockpiling: If stockpiling is requested, locations and amounts of stockpiles will be designated by Landscape Architect.

2.03 FINE SAND

A. Physical Properties (dry weight basis):

Percent Passing	Sieve Size
100	4.76 mm (4, 4 mesh)
95-100	1.00 mm (#18, 16 mesh)
65-100	500 micron (#35, 32 mesh)
0- 50	250 micron (#60, 60 mesh)
0- 20	105 micron (#140, 150 mesh)
0- 5	53 micron (#270, 270 mesh)

B. Chemical Properties:

1. Salinity: The saturation extract conductivity shall not exceed 3.0 milliohms/cm @ 25 degrees C.
2. Boron: The concentration in the saturation extract shall not exceed 1.0 ppm.
3. Sodium: The sodium absorption ratio (SAR) as calculated from analysis of the saturation extract shall not exceed 6.0.

2.04 CHEMICAL ADDITIVES

The following additives may or may not be used depending on the outcome of the soils agricultural suitability report.

A. Ground Limestone: Agricultural limestone containing not less than 85% of total carbonates, ground to such fineness that 50% will pass #100 sieve and 90% will pass #20 sieve.

B. Dolomite Lime: Agricultural grade mineral soil conditioner containing 35% minimum magnesium carbonate and 49% minimum calcium carbonate, 100% passing #65 sieve. "Kaiser Dolomite 65 AG" as manufactured by Kaiser, Inc. Mineral Products Department, or equal.

C. Gypsum: Agricultural grade product containing 80% minimum calcium sulphate.

D. Iron Sulfate (Ferric or Ferrous): Supplied by a commercial fertilizer supplier, containing 20% to 30% iron and 35% to 40% sulphur.

E. Sulphate of Potash: Agricultural grade containing 50% to 53% of water-soluble potash.

F. Single Superphosphate: Commercial product containing 20% to 25% available phosphoric acid.

G. Ammonium Sulphate: Commercial product containing approximately 21% ammonia.

H. Ammonium Nitrate: Commercial product containing approximately 34% ammonia.

I. Calcium Nitrate: Agricultural grade containing 15-1/2% nitrogen.

J. Urea Formaldehyde: Granular commercial product containing 38% nitrogen.

K. I.B.D.U. (Iso-Butyldiene Diurea: Commercial product containing 31% nitrogen.

PART 3 - EXECUTION

3.01 SOIL PREPARATION

A. General:

1. Moisture Content: Do not work soil when moisture content is so great that excessive compaction will occur, nor when it is so dry that dust will form in air or that clods will not break readily. Apply water, if necessary to bring soil to an optimum moisture content for tilling and planting. Maintain within 2 percent above or below optimum moisture content at all times during the work.
2. Clearing of Debris: Clear all planting areas of stones 2 in. diameter and larger, weeds, debris and other extraneous materials prior to amending existing soil and incorporating imported topsoil.

B. Preparation of Existing Soil to be Soil Conditioned:

1. Verification of Existing Grades: Verify that grades are within 1 in. plus or minus of the required finished grades or finish sub-grades. Report all variations.
2. Cultivation: Rip or cultivate all areas to be soil conditioned to a depth of 6 in. for all lawn and grass area and 10" for all perennial and ground cover immediately prior to amending existing soil.
3. Trees to Remain: Hand cultivate within the dripline of existing trees to remain. Depth of cultivation shall not exceed 2 in. Cultivate immediately prior to amending existing soil.

3.02 SOIL CONDITIONING

A. Amending of Existing Soil:

1. Verification: Do not commence amending of existing soil prior to acceptance of finish grade or finish sub-grade.
2. Application Rate: Apply organic compost to all shrub planting beds and lawn areas at the rate of 3 cubic yards per 1,000 square feet:
3. Incorporation of Amendments: Incorporate thoroughly with top 6 in. of soil layer and bring amended soil to finish grades and elevations shown on Drawings. Do not work soils under frozen or muddy conditions.

B. <u>Preparation of Perennial Planting Beds:</u>

1. Excavate all groundcover and perennial planting beds to a depth of 18" below finish grade, or as noted in the plant material details.
   Contractor is responsible to install all planting beds so they are continuous.
2. Backfill with mixture for plant beds consisting of the following:
   80% Imported topsoil (with necessary amendments per analysis)
   20% Organic compost (with necessary amendments per analysis)
3. Dispose of excess native site soil excavated from plant bed.

C. <u>Backfill Mix for Tree & Shrub Planting Beds:</u>

1. Excavate all tree shrub planting beds so bottom of tree rootball rests on undisturbed grade.
   Contractor is responsible to install all planting beds so they are continuous.
2.. Backfill with mixture for plant beds consisting of the following:

80% Imported topsoil (with necessary amendments per analysis)
20% Organic compost (with necessary amendments per analysis)

E. Topsoil used for lawn areas:

1. Spread topsoil to achieve a uniform depth of 6” for lawn areas.
2. Apply topsoil using a hand roller to lightly compact the topsoil.
3. Confirm topsoil meets all testing requirements.

3.03 WEED CONTROL

A. Apply pre-emergent weed control to all areas to receive woody, non-lawn ornamental planting after amendment of topsoil.

B. Spray all weeds that may have established prior to planting or sodding operations with post emergent herbicide. If rain occurs within 6 hours of application, reapply the product. Wait at least 7 days after last application to rake, till, or re-plant.

C. Apply strictly according to manufacturer's current printed specifications.

3.04 DETRIMENTAL DRAINAGE, SOILS AND OBSTRUCTIONS

A. Notification: Submit in writing all soils or drainage conditions considered detrimental to growth of plant materials. State condition and submit proposal and cost estimate for correcting condition.

B. Correction: Submit for acceptance a written proposal and cost estimate for the correction before proceeding with work.

C. Obstructions: If rock, underground construction work, tree roots or other obstructions are encountered in the performance of work under this section, submit cost required to remove the obstructions to a depth of not less than 6 in. below the required soil depth.

3.05 CLEAN-UP

A. Keep all areas of work clean, neat and orderly at all times.

B. Clean up and remove all deleterious materials and debris from the entire work area prior to final acceptance.

END OF SECTION

SECTION 02920 - FINE GRADING

PART 1 - GENERAL

1.1 DESCRIPTION

A. Related Requirements: Review the General Contract Conditions and Division One, General Requirements, which contain information and requirements that apply to this Section.

B. Work Included: Execute finish grades complete, as shown, and as specified. The work includes but is not limited to:
   1. Site grading and filling to indicated elevations, profiles and contours.
   2. Subgrade preparation for slabs, curbs, walks and paving.
   3. Finish grading.

C. Related Work in Other Sections:
   1. Soil Preparation - Section 02916
   2. Seeding - Section 02922
   3. Trees Shrubs and Groundcovers – Section 02930

1.2 PROJECT CONDITIONS

A. Protection of Existing Plants to Remain: See Section 02231 – Tree Protecting & Trimming.

B. Known underground and surface utility lines indicated on the drawings are for information only. The contractor is responsible for verifying all utility locations. Contact utility notification service prior to commencing work.

1.3 QUALITY ASSURANCE

A. General: Perform work in accordance with all applicable laws, codes and regulations required by local government authority.

B. Testing Agency: Selected and paid for by Contractor; any required retesting paid for by Contractor.

C. Field Density Tests: Intervals not exceeding 2 ft. fill height with compaction tests made by Testing Agency.

D. Over-cutting: Replace and compact all over-cut material to required compaction.

1.4 LAYOUT AND SURVEY

A. Licensed Surveyor or Civil Engineer: Employ a licensed surveyor or civil engineer to stake out lines and levels.

B. Discrepancies: Right is reserved to make minor adjustments as necessary and if discrepancies are found.

1.5 SITE MAINTENANCE

A. Standing Water: Keep site free of standing water at all times. Provide and maintain

ditches, grading or pumping as necessary to prevent erosion, softening of compacted surfaces and formation of mud in trenches and excavation.

B. Dust: Assume full responsibility for all alleviation or prevention of dust nuisance on or about the site.

C. Bulkheading and Shoring: Provide as necessary, and maintain temporary slopes during construction.

PART 2 PRODUCTS

2.1 TOPSOIL: Refer to Soil Preparation specification 02916

PART 3 - EXECUTION

3.1 GENERAL

A. Suspension of Work: If grading is suspended, disturbed areas shall be brought to required grade and immediately seeded and mulched.

B. Verification of Previous Work: Verify that all areas to receive imported topsoil have been completed prior to commencement of fine grading.

3.2 PREPARATION

A. Establish extent of grading by area and elevation. Designate and identify datum elevation and project engineering reference points. Set required lines, levels and elevations.

B. Do not cover or enclose work of this Section or other trades and Sections before obtaining required observations, tests, approvals, and location recording.

3.3 EXISTING UTILITIES

A. Before starting grading, establish the location and extent of underground utilities in the work area. Exercise care to protect existing utilities during fine grading operations. Perform excavation work near utilities by hand and provide necessary shoring, sheeting, and supports as the work progresses.

B. Maintain, protect, relocate, or extend as required existing utility lines to remain which pass through work area. Pay costs for this work, except as covered by the applicable utility companies.

C. Protect active utility services uncovered by excavation.

3.4 MOISTURE CONTENT

A. Inadequate Moisture Content: Add water and thoroughly mix into fill material until the moisture necessary is uniformly dispersed throughout.

B. Excessive Moisture Content: Aerate fill material by blading or other acceptable methods until moisture content is uniformly reduced to achieve required compaction.

3.5 COMPACTION

A. Percent Compaction: ASTM Test Method D 1557 maximum dry density.

B. Existing Sub-grade: Compact fill areas by scarifying to required depths.

C. Planting Areas: Compact fill material to 85% compaction for the top 3 ft. in bermed areas and full depth in planter areas.

3.6 FINISH GRADING

A. General:
1. Grade smooth all planting areas after weeding, topsoil spreading, soil preparation, and soil conditioning have been completed and soil has been thoroughly compacted.
2. Provide finish sub-grade elevations parallel to finished surface grades to allow for pavement depths, topsoil, soil amendments and mulch. Provide uniform levels and slopes.
3. Provide all grades for natural runoff of water without low spots or pockets. Accurately set flow line grades at 2% minimum gradient unless otherwise noted in Drawings.
4. Finish grades shall be smooth, even and on a uniform plane with no abrupt changes of surface. Slope uniformly between given spot elevations.
5. Grades not otherwise indicated shall be uniform levels or slopes between points where elevations are given, or between points established by walks, paving, curbs or catch basins.
6. Tops and toes of all slopes shall be rounded to produce a gradual and natural-appearing transition between relatively level areas and slopes.

B. Grades:
1. Tolerance: All planting areas, including lawn areas, shall be true to grade within 1 in. when tested in any direction with a 10 ft. straightedge.
2. Discrepancies: Provide positive surface drainage of planted areas. Submit in writing all discrepancies in the Drawings, Specifications, or prior work done by others, which the Contractor feels, precludes establishing proper drainage.
3. Correction: Include description of work required for correction or relief of said condition.
4. Finished Grades of Shrub, Perennial, and Groundcover Areas: 1 in. below top of adjacent pavement, headers, curbs, or walls unless otherwise indicated on the Drawings.
5. Finished Grades of Lawn Areas: 1" below top of adjacent pavement, curbs or headers.

3.7 CLEAN-UP

A. Keep all areas of work clean, neat and orderly at all times.

B. Clean up and remove all equipment, deleterious materials and debris from the entire work area prior to Final Acceptance.

END OF SECTION

SECTION 02922

SEEDING

PART 1 – GENERAL

1.01 SCOPE

Furnish all labor, materials, supplies, equipment, tools, and perform all operations in connection with and reasonably incidental to complete the installation of sod and seed, and guarantee/warranty as shown on the drawings and as specified herein. Items of work specifically include but are not limited to: sodding, seeding, fertilizer, straw mulch, and maintenance.

1.02 WORK NOT INCLUDED

Earthwork and grading, planting trees, shrubs, and groundcovers, and irrigation.

1.03 RELATED WORK

Section 02930 - Trees, Shrubs and Groundcovers

1.04 QUALITY ASSURANCE

A. Seed Materials: Subject to inspection and acceptance. Owner's Representative reserves the right to reject at any time or place prior to acceptance, any work, and seed materials which in the opinion of the Owner's Representative fails to meet these specification requirements.

1. Inspection: Primarily for quality; however, other requirements are not waived even though visual inspection results in acceptance.
2. Inspection will be made daily during seeding operations, at completion and at end of warranty period by Owner's Representative.

1.05 REFERENCES

A. Reference Standards: U.S. Department of Agriculture Rules and Regulations under Federal Seed Act and equal in quality to standards for Certified Seed.

1.06 SUBMITTALS

A. Seed Certificates: State, Federal and other inspection certificates shall accompany the invoice for materials showing source or origin. Submit to Owner's Representative prior to acceptance of material.

B. Fertilizers: Furnish delivery receipts for all organic and chemical fertilizers used.

C. Warranty: At completion of work, furnish written warranty to Owner based upon requirements as specified.

D. Hydromulch: Furnish analytical data for all hydromulch.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Seed: Deliver seed to site in original unopened container bearing manufacturer's guaranteed seed analysis, name, trade name, trademark, warranty and conformance to state law.

1. Store seed in cool, dry place prior to application.
2. Material shall be inspected upon arrival at job site.
3. Unacceptable materials shall be immediately removed from job site.

B. Fertilizer: Deliver inorganic or chemical fertilizer to site in original unopened container bearing manufacturer's guaranteed chemical analysis, name, trade name, trademark, warranty and conformance to state law.

1. Material shall be inspected upon arrival at job site.
2. Immediately remove unacceptable material from job site.

1.08 ENVIRONMENTAL CONDITIONS

A. Existing Conditions:

1. Import and place any fill material required to adjust the fine grade to meet drainage requirements or to match hard surface fine grades.
2. Vehicular accessibility on site shall be as directed by Owner's Representative. Repair damage to prepared grounds and surfaces caused by vehicular movement during work under this section to original condition at no additional cost to Owner.
3. Environmental Requirements: Do not install sod on saturated or frozen soil.

1.09 GUARANTEE AND REPLACEMENT

A. Seed: Warrant seed for a period of one year from date of Substantial Completion to be in a healthy, vigorous growing condition.

1. During the original warranty period, replace at once all seed areas that die due to natural causes, etc., or which in Owner's Representative opinion are unhealthy.
2. Replacement will not be required in any season definitely unfavorable for seeding.
3. Install replacements as originally specified and warranted.
4. Seed shall be visibly germinated in twenty days, with 50% coverage in 45 days and 90% coverage in 60 days. Any deficiency shall be reseeded until a suitable coverage is achieved.

1.10 MAINTENANCE

A. General: The maintenance period shall begin immediately after each area is sodded or seeded and continue until final acceptance of entire project, which is one year from date of accepted substantial completion. During this time, the Contractor shall be responsible for watering, mowing, spraying, weeding, aerating, fertilizing, and all related work as necessary to ensure that seeded areas are in a vigorous growing condition. Furnish all supervision, labor, material and equipment to maintain turf areas, including winterization and start-up procedures.

B. Materials: Conform to specification or otherwise be acceptable to Owner's Representative.

C. Watering: Initially water seeded areas upon completion of convenient work areas until installation is complete. Water seeded areas sufficiently to moisten subsoil at least 4" deep in a

manner not to cause erosion or damage to adjacent finished surfaces. Water shall be free of substances harmful to plant growth. For frequency of watering, see the Landscape Maintenance specification.

D. Fertilizing: If work has not received final acceptance within 45 days after initial fertilizer application to sodded areas, repeat fertilizer application to maintain optimal sod vigor.

E. Mowing and Trimming:

1. Mow and trim around trees (keeping mulch in saucers and beds), walls, fences, etc., maintaining turf at 2” to 2-3/4" height. Do not remove more than 33% of grass leaf in single mowing. Remove grass clippings from pavement areas.

F. Re-seeding: Reseed all areas larger than 2 sq. ft. not having healthy, uniform stand of grass.

H. Insect and Disease Control: As required, using insecticides and fungicides approved by Owner.

PART 2 - PRODUCTS

2.01 QUALITY

All materials used for seeding shall be new and without flaws or defects of any type, and shall be the best of their class and kind.

2.02 SEED MIXES

Seed for turf mixes shall be certified seed; fresh, clean, new crop seed, composed of the varieties as specified, conforming to tests as specified, and applied at the rate shown. All seed shall be mixed by the wholesale dealer. The seed shall be mixed in the proportions necessary to obtain the application rate specified. Submit dealer's certification of composition of mixture, percentage of purity, germination, maximum weeds of each seed mix, and supply total number of pounds of grass seed required per 1,000 S.F. based on volume of seed mix. Deliver to site in unopened bags with seed tags attached.

A. Seed Mix Type A: Lawn Areas

Green Mountain Special Mix:

Common Name	Pure Live Seed % by Weight	Max. Weeds % by Weight
Creeping Red Fescue	40%	0.30%
Kentucky Bluegrass	20%	0.30%
Perennial Ryegrass	40%	0.30%

Application Rate: 4lbs per 1,000 sf
Supplier: Oliver Seed Company

B. Seed Mix Type B: Conservation Areas
1. Type: Vermont Conservation and Wildlife Mix
2. Application Rate: 1 lb per 1,600 sf
3. Source: Vermont Wetland Plant Supply or approved equal.

C. Seed Mix Type C: Meadow Areas
1. Type: Vermont Native Wildflower and Grass Mix

2. Application Rate: 1 lb per 1,600 sf
3. Source: Vermont Wetland Plant Supply

2.03 WATER

A. Verify availability of water. It is the intent that all plant materials receive water immediately after installation.

2.04 FERTILIZER

A. When applied as a topsoil amendment, fertilizer shall have an analysis that will deliver appropriate amounts of nitrogen, phosphorus, and potassium as required to remedy deficiencies revealed by testing of the topsoil.

C. Fertilizer shall be delivered in manufacturer's standard container printed with manufacturer's name, material weight, and guaranteed analysis.

D. Fertilizers with N-P-K analysis other than that stated above may be used provided that the application rate per square foot of nitrogen, phosphorous, and potassium is equal to that specified.

2.05 HYDROMULCH

A. Wood Cellulose Fiber Mulch: Wood cellulose fiber mulch shall be for use with hydraulic application of grass seed and fertilizer. Fiber shall not contain germination or growth inhibiting factors. It shall be dyed an appropriate color to allow visual metering of its application. The fiber shall be sprayed uniformly on the soil surface, providing a cover that readily absorbs water and infiltration to the soil below. Suppliers shall be prepared to certify that laboratory and field testing of their product has been accomplished, and that it meets all of the foregoing requirements.

1. Hydro-Mulch: "Silva-Fiber" manufactured by Weyerhaeuser Company.
2. Tackifier: "M-Binder" manufactured by Ecology Controls.

B. Fertilizer for Tank Mix: Shall be 13-13-13 grade, pelleted, uniform in composition, free-flowing, and suitable for application with approved equipment. Fertilizer shall be delivered to the site fully labeled, conforming to the applicable state fertilizer laws, and bearing the name or trademark and warranty of the producer.

PART 3 - EXECUTION

3.01 INSPECTIONS AND REVIEW

A. Site inspection and review: Verify that existing site conditions are as specified and indicated before beginning work under this section. Verify layout of seeded areas as indicated prior to starting operations. Verify fine grading is complete and accepted by the Owner and is within +/- 0.10 ft. of grades indicated on plans.

B. Unsatisfactory Conditions: Report in writing to Owner with copy to Owner's Representative.

C. Beginning of work in this section implies acceptance of existing conditions by the Contractor.

3.02 SITE PREPARATION

A. Responsibility:
   1. Contractor shall be responsible for proper repair to landscape, utilities, fences, pavements and other site improvements damaged by seeding operations under this Section.
   2. Contractor shall pay for repairs to existing site improvements damaged during construction at no cost to the Owner.
   3.

B. Clearing: Prior to any soil preparation, existing vegetation not to remain and which might interfere with the specified soil preparation shall be mowed, grubbed, raked, and the debris removed from the site. Prior to or during grading or tillage operations, the ground surface shall be cleared of materials which might hinder final operations.

C. Seeding Areas: Remove weeds, debris, rubble, rocks, and plant material larger than 1/2" not scheduled to remain.

D. Repair: Re-establish grade and specified conditions to existing or damaged sod areas prior to placing sod. Provide smooth grade transitions at interface with existing sod areas.

E. Fine Grading: Perform as required to maintain positive drainage, prevent ponding and direct run-off into catch basins, drainage structures, etc., and as required to provide smooth well-contoured surface prior to proceeding. Tolerance: +/-0.10 ft.

F. Coordinate restoration of fine grade to establish the subgrade at the following depths below design finished grade:

		Adjacent to Curbs & Other Hard Surfaces	Open Areas
a.	Seeded areas	1/4"	0" + 1"

G. Prior to seeding low maintenance grasses, irrigate for a minimum of three weeks to allow germination of weed seeds. Apply Round-Up herbicide per manufacturer's specifications after germination of weed seeds and at least two weeks prior to tree planting and seeding the low maintenance grasses. Do not spray Round-Up herbicide on a day when wind is detectable. Remove remaining vegetative matter prior to seeding.

3.03 FERTILIZING

A. Turf Soil Preparation: Spread the following amendments over the entire irrigated turf and incorporate into the top four inches of soil by discing or roto-tilling until a uniform mixture is obtained with no pockets of soil or amendments remaining:

   1. Pre-planting Fertilizer: (0-46-0), 6.5 lbs./1,000 S.F.

B. Fertilizer and conditioners shall be applied at the following rates:

   1. Fertilizer - as required by test results of topsoil.

C. Subsequent Applications: Distribute fertilizer uniformly at a rate of 1 lb. actual nitrogen per 1,000 S.F. using 20-5-10 with at least 50% Sulfur coated Urea. (Note: This fertilizer application only applies if project has not been accepted by Landscape Architect by this date).

D. Do not amend the seed mix area soils.

3.04 GRASS SEEDING

A. Broadcast Seeding: Mix seed with clean, dry sand for broadcast distribution at the rate of 4 parts sand to 1 part seed. Seed at the rates given below. Seed in two passes at right angles to one another. Sow half the seed in each pass. Provide markers or other means to assure that the successive seeded strips will overlap or be separated by a space no greater than the space between the rows planted by the equipment being used. Incorporate seed to ¼" depth with hand rakes or other mechanical methods. Do not seed during windy weather. Restore fine grade after seeding as requested by Owner's Representative. Remove irregularities by hand raking or rolling.

B. Any areas that are hand seeded shall have erosion control netting applied to hold seed in place. Hay matting is not allowed, only loose straw is allowed. All seeded areas to be staked, and maintained by contractor to prevent pedestrian traffic. Stakes and netting to be removed by contractor prior to first mowing.

3.05 SEED ESTABLISHMENT

A. All seeded grass areas are to be assured of obtaining a satisfactory stand of growth. The total area occupied by bare spots larger than 0.5 square feet must not exceed ten percent (10%) of the total seeded area. Maximum single bare spot size of non-irrigated seed is two (2) square feet. All seeded grass areas which do not meet the satisfactory stand of growth qualification shall be reseeded with additional straw mulch applied by mechanical crimper.

C. Re-seed areas in May following initial seeding that in the opinion of the Owner's Representative are not adequately established.

D. After one growing season, there shall be no visual difference between seed and healthy non-irrigated seed areas.

3.06 HYDROMULCH

A. Hydro-mulch all seeded areas. Mix ingredients to form a homogeneous slurry. Using the color of the mulch as a metering agent, spray the slurry mixture uniformly over the designated seeded area.

B. The mixture shall be applied at a rate of 2,000 lbs. per acre for Silva-Fiber, 800 lbs. per acre for fertilizer, and of 70 lbs. per acre for M-Binder.

C. Hydro-mulching shall not be done in the presence of surface water. Thoroughly clean site amenities after mulching.

3.07 NOTIFICATION OF INSPECTION

A. Notification: Give notice requesting inspection by Owner's Representative at least 7 days prior to the anticipated date of completion. All sod must be alive and healthy in order to be considered complete.

B. Deficiencies: If deficiencies exist, Owner's Representative shall specify such deficiencies to the Contractor who shall make satisfactory adjustments and will again notify the Owner's Representative for final inspection.

3.08 CLEANING

A. Cleaning: Remove pallets, unused sod, and other debris from site. Clean paved and finished surfaces soiled as a result of work under this Section. Remove debris from all drainage inlets and structures.

3.09 PROTECTION

A. General: Provide and install barriers as required and as directed by Owner's Representative to protect sodded areas against damage from pedestrian and vehicular traffic until acceptance by Owner.

END OF SECTION

SECTION 02930

TREES, SHRUBS AND GROUNDCOVERS

PART 1 - GENERAL

1.01 DESCRIPTION

A. Related Requirements: Review the General Contract Conditions and Division One, General Requirements, which contain information and requirements that apply to this Section.

B. Work Included: Provide planting of trees, shrubs, groundcover, perennials and bulbs complete as shown and as specified.

C. Related Work in Other Sections:
Soil Preparation - Section 02916
Seeding - Section 02922

1.02 QUALITY ASSURANCE

A. Certificates:

1. Submit certificates of inspection as may be required by local law for transportation of each shipment of plants along with invoice.
2. File copies of certificates after acceptance of material. Inspection by Federal or State Governments at place of growth does not preclude rejection of plants at project site.

B. Applicable Standards: Apply standards for plant materials as described in the following:

1. "American Standard for Nursery Stock," May 2, 1986 Edition, American Association of Nurserymen, Inc. This shall supersede these criteria in the event of contradiction or ambiguity.
2. Hortus III - 1976 Edition, Bailey Horatorium, Cornell University.

1.03 PROTECTION OF EXISTING PLANTS TO REMAIN

A. General:

1. Contractor shall make every effort to minimize or prevent tree damage that may result from proposed construction activities.
2. Trees to be saved or removed shall be clearly identified in the drawings. Removal of designated trees shall also include stump grinding.

B. Soil Compaction:

1. To prevent soil compaction, designated routes for equipment and foot traffic by work crews shall be predetermined prior to commencing construction activities. These routes shall be marked at the site, before construction commences, with durable fencing material that is a minimum of four feet in height (flagging tape or any other material that may be torn down, moved, or accessed through is not acceptable).
2. It shall be the responsibility of the project supervisor to inform all construction crew members on the site of access route location, and to ensure that only these routes are used.
3. To prevent tree root smothering, soil, supplies, equipment or any other material shall not be

piled within dripline. Material shall not be placed within dripline or less than 15 feet from trunk, whichever is greater, of pyramidal or columnar shaped trees.

4. No heavy objects such as wood pallets, metal railings, etc., shall lean against or come into contact with tree trunk.

C. Root Protection:

1. Tree roots shall not be cut unless cutting is unavoidable.
2. When root cutting is unavoidable, a clean sharp cut shall be made to avoid shredding or smashing. Exposed roots shall be covered immediately to prevent desiccation. Whenever possible, tree roots should be cut between late fall and bud opening, when root energy supplies are high and conditions are least favorable for disease causing agents.
3. When more than one root that is two inches or greater in diameter of any public tree is cut, supplemental watering is necessary if tree lacks an operational sprinkler system. Contractor shall provide watering at his or her own expense.
4. The Landscape Architect shall be notified of any cutting of more than one tree root having thickness greater than four inches. Trenches shall be hand dug around tree roots with a diameter of four inches or more or when in close proximity to low branching trees.
5. Paths and paving levels should be contoured sufficiently to avoid cutting surface tree roots. Whenever possible, tree roots should be bridged or floated over with paths.

D. Tree Fencing:

1. Fencing material shall encircle any tree whose outer dripline edge is within 20 feet of any construction activities.
2. Fencing material shall be a bright, contrasting color, durable, and a minimum of four feet in height (See Figure 2). Posts used shall be comparable to metal T-post or heavier weight, and placed to a depth or no less than two feet below ground level.
3. Fencing material shall be placed at the drip line or 15 feet from tree trunk, whichever is greater, and maintained in an upright position throughout the duration of construction activities.

E. Attachment of Foreign Materials to Trees: The attachment or installation to trees of any metal material, sign, cable, wire, nail, swing, or any other material that is foreign to the natural structure of the tree, is prohibited. Standard arboricultural techniques (such as bracing and cabling) that are performed by tree professionals are excepted.

F. Maintenance Requirements:

1. Additional maintenance may be required by Contractor for all existing trees in close proximity to construction activities to reduce stress related tree problems.
2. Root Protection:
   a. Trees having roots cut between the months of March and August may be required to receive supplemental deep root watering once per week for a minimum of two months after the date of the root cut. When roots are cut between September 1 and October 15, supplemental watering is needed once per week until October 31.
   b. Tree roots shall not be fertilized for a period of one year following the cessation of construction activities.
3. Compaction Mitigation:
   a. Soil around tree drip line shall be aerated before and after construction activities. This is necessary even when compaction results from heavy foot traffic. Conventional turf aeration equipment is acceptable, although the Landscape Architect may approve deeper aeration.
   b. When foot traffic or equipment use is unavoidable within the drip line, the area within drip line shall be mulched with wood chips to a depth of six inches prior to

construction activity. Six inch mulch depth shall be maintained for the duration of the project, and shall be removed upon completion.

4. Pruning: No pruning shall occur during or after construction activities except for the removal of dead or damaged branches, or to prevent branch damage. Pruning of healthy branches shall be delayed for a period of two years.

G. Replacement of Damaged Plants:

1. Replace existing plants to remain which are damaged during construction with accepted plants of the same species and size as those damaged at no cost to Owner.
2. Landscape Architect will determine extent of damage and value of damaged plants.

1.04 SUBMITTALS

A. Samples: Submit prior to delivery to site. Attach product name, address of manufacturer and/or supplier to each sample.

1. Mulch: One (1) pint each type.
2. Nylon Tree Strap: Two (2) each type.

1.05 WORK SCHEDULE

A. Proceed with the work as rapidly as the site becomes available, consistent with normal seasonal limitations for planting work.

1.06 SELECTION, TAGGING AND ORDERING OF PLANT MATERIAL

A. Documentation: Submit documentation within 10 days after award of Contract that all plant materials have been ordered. Arrange procedure for review of plant materials at time of submission.

B. Review: Request for review of plant materials and quantity at place of growth or from nursery shipment site at least 7 days in advance of shipping to site. Right is reserved to refuse review at this time if, in Landscape Architect's judgment, a sufficient quantity of plants is not available.

C. Transportation: Contractor shall accompany Landscape Architect to all review(s) of plant materials at the nursery. Landscape Architect will review and tag plants at place of growth and upon delivery for conformity to specifications.

D. Distant Material: Submit photographs with a person adjacent to plants for preliminary review. Such review shall not impair the right of review and rejection during progress of the work.

E. Unavailable Material: If proof is submitted that any plant specified is not obtainable, a proposal will be considered for use of the nearest equivalent size or variety with corresponding adjustment of Contract price. Substantiate such proof in writing no later than 20 days after award of contract. Approval of late substitutions is at the sole discretion of the Landscape Architect.

1.07 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Labeling: Furnish standard products in manufacturer's standard containers bearing original labels legibly showing quantity, analysis, genus/species and name of manufacturer/grower.

B. Storage: Store products with protection from weather or other conditions that would damage or impair the effectiveness of the product. Protect metal containers from sun during summer

months with temperatures above 80 degrees F.

C. Handling: Do not lift or handle container plants by tops, stems or trunks at any time. Do not bind or handle plants with wire or rope at any time.

D. Anti-Desiccant: At Contractor's option, spray all evergreen or deciduous plant material in full leaf immediately before transporting with anti-desiccant. Apply an adequate film over trunks, branches, twigs and foliage.

E. Digging: Dig ball and burlap plants with firm, natural balls of earth of diameter not less than that recommended by USDA Standard for Nursery Stock, and of sufficient depth to include the fibrous and feeding roots.

1.08 ANALYSES OF SAMPLES AND TESTS

A. Sampling: Right is reserved to take and analyze samples of materials for conformity to specifications at any time. Furnish samples upon request.

B. Rejected Materials: Remove rejected materials immediately from the site at Contractor's expense. Pay cost of testing of materials not meeting specifications.

1.09 MAINTENANCE PERIOD AND FINAL ACCEPTANCE: See Section 02970 - Landscape Maintenance

1.10 WARRANTY PERIOD

A. Warranties:

1. Correct Species: Warrant that all plant materials are true to species and variety.
2. Vigor: Warrant that all trees and shrubs planted (except those species specifically noted below) under this Contract will be healthy and in flourishing condition of active growth one year from date of Final Acceptance. Similarly warranty perennial and groundcover for one full growing season from date of Final Acceptance.

B. Delays: All delays in completion of planting operations that extend the planting into more than one planting season shall extend the Warranty Period correspondingly.

C. Condition of Plants: Plants shall be free of dead or dying branches and branch tips, with all foliage of a normal density, size and color.

D. Replacements: As soon as weather conditions permit, replace, without cost to Owner all dead plants and all plants not in a vigorous, thriving condition, as determined by Project Manager during and at the end of Warranty Period. Replacement trees shall have similar warranty for one year from date of replacement planting.

E. Exclusions: Contractor shall not be held responsible for failures due to neglect by Owner, vandalism, etc., during Warranty Period. Report such conditions in writing to the Landscape Architect.

1.11 REPLACEMENTS

A. Guarantee: For a period of one (1) year (or as noted in Section 1.10 above) after final acceptance of all work and at no additional cost to the Owner, the Contractor is to replace any new or transplanted plant material that is dead, or that is, in the opinion of the Landscape Architect, in unhealthy or unsightly condition, or that has lost their natural shape due to dead

branches or excessive pruning of dead branches, or that has been damaged beyond repair due, in the judgment of the Landscape Architect, to inadequate maintenance and/or protection from animal damage or the natural elements.

B. Failed Materials:

1. Plant materials exhibiting conditions which are determined as being unacceptable due to workmanship by the Contractor shall be repaired and/or replaced at no additional cost to the Owner as determined by Landscape Architect.
2. Closely match replacements to adjacent specimens of the same species. Apply all requirements of this Specification to all replacements.
3. Contractor shall be held responsible for a maximum of two (2) replacements for each failed tree and shrub after final acceptance during warranty period.

C. Incorrect Materials:

1. During Warranty Period, replace at no cost to Owner all plants revealed as being untrue to name.
2. Provide replacements of a size and quality to match the planted materials at the time the mistake is discovered.

D Existing Tree Protection: In addition to any other criminal or civil penalty, if , as the result of the violation, the injury, mutilation, or death of a tree, shrub, or other plant located on the Owner's property is caused, the cost of repair or replacement of such tree, shrub, or other plant shall be borne by the party in violation. Replacement value of trees and shrubs shall be determined in accordance with the latest revision of "Valuation of Landscape Trees, Shrubs, and Other Plants," as published by the International Society of Arboriculture.

PART 2 - PRODUCTS

2.01 PLANT MATERIALS

A. General: Verify that all container stock has been grown in the containers in which delivered for at least two (2) months, but not over two (2) years for shrubs or one (1) year for perennial and groundcovers. Do not install container plants that have cracked or broken balls of earth when taken from container.

1. Growing Conditions: Plants shall be nursery-grown in accordance with good horticultural practices under similar climatic conditions to those of the project for at least two years unless otherwise specifically authorized. Collected material shall be identified for approval by the Landscape Architect.
2. Appearance: All plants shall be exceptionally heavy, symmetrical, tightly knit, and so trained or favored in development and appearance as to be superior in form for their species, with regard to number of branches, compactness and symmetry.
3. Vigor: Plants shall be sound, healthy and vigorous, well branched and densely foliated when in leaf. They shall be free of disease, insect pests, eggs, or larvae. They shall have healthy, well-developed root systems. Plants shall be free from physical damage or adverse conditions that would prevent thriving growth.

B. Condition of Root System: Samples must prove to be completely free of circling, kinked or girdling trunk surface and center roots and show no evidence of a root-bound condition.

C. Measurements:

1. General: Measure plants when branches are in their normal upright position. Height and

spread dimensions specified refer to main body of plant and not branch tip to tip. Take caliper measurement at a point on the trunk 6 in. above natural ground line for trees up to 4 in. in caliper and at a point 12 in. above the natural ground line for trees over 4 in. in caliper. Evergreen trees shall be measured from the base of the tree to the midpoint of the top central leader.

2. Size Range: If a range of size is given, do not use plant materials less than the minimum size. Not less than 40 percent of the plants shall be as large as the maximum size specified. The measurements specified are the minimum size acceptable and are the measurements after pruning, where pruning is required. Plants that meet the measurements specified, but not possess a normal balance between height and spread shall be rejected.
3. Substitutions: Substituted plants shall be true to species and variety and shall conform to measurements specified except that plants larger than specified may be used if accepted. Use of such plants shall not increase Contract price. If larger plants are accepted, increase the ball of earth in proportion to the size of the plant.

D. Pruning: Do not prune plants before delivery. For pruning after installation, see Section 32 0130 Landscape Maintenance.

E. Condition: Trees which have multiple leaders, unless specified, or damaged or crooked leaders will be rejected. Trees having a main leader shall not have been headed back. Trees with abrasions of the bark, sunscalds, disfiguring knots, or fresh cuts of limbs over 3/4 in. which have not completely callused, will be rejected.

2.02 COMMERCIAL FERTILIZERS

A. Top-dress Fertilizer: Complete fertilizer, 50 percent of the nitrogen to be derived from natural organic sources or urea-form. Available phosphoric acid shall be from superphosphate, bone or tankage. Potash shall be derived from muriate of potash containing 60 percent potash:

16% Nitrogen
6% Phosphoric Acid
8% Potash

B. Perennials: Diammonium Phosphate (18-46-0).

2.03 STAKING MATERIALS

A. Tree Stakes: Rough-sawn, sound, new hardwood, free of knots, holes, cross grain, and other defects, 2 by 2 inches by length indicated, pointed at one end.

B. Wire Ties: 11 gauge, single strand, galvanized steel.

C. Nylon Straps: 2” X 12” wide nylon/cotton weave with ¾” grommet at each end as accepted by Landscape Architect.

2.04 GUYING MATERIALS

A. Anchor and Hardware:

1. Standard Steel ‘T’ posts, dark green; 2’-6” long. Cut flush to the ground after guying trees.
2. Hardware: 11 gauge, single strand, galvanized steel wire ties with rubber, two-ply, dark-colored, ½”- 5/8” diameter protective hose loops or approved equal.
3. Plastic Guy Covers: 3/8 in. diameter x 3 ft. long white plastic tubing. Provide for all guyed installations as identified in the field by the Landscape Architect.

4. Provide for all guyed installations of evergreen trees.

2.05 WATER

A. Clean, fresh and potable, furnished and paid for by Owner.

2.06 MULCH

A. Organic mulch, free from deleterious materials and suitable as a top dressing of trees and shrubs, consisting of one of the following:

1. Type: Ground or shredded hemlock bark, dark brown in color.

2.07 ANTI-DESICCANT

A. Type: Anti-desiccants for retarding excessive loss of plant moisture and inhibiting wilt shall be sprayable, water insoluble vinyl-vinyledine complex which will produce a moisture retarding barrier not removable by rain or snow.

B Manufacturer: Wilt-pruf Formula NCF as manufactured by Nursery Specialty Products, Greenwich, CT, or accepted equal.

PART 3 - EXECUTION

3.01 REPLANT REVIEW

A. General: Do not commence planting work prior to acceptance of soil preparation.

B. Finish Grades: Finish grades for all planting areas shall have been established in accordance with Section 02210. Verify that all grades are within 1 in. plus or minus of required finish grade and that all soil amendments have been installed as specified under Section 32 9113 Soil Preparation. Fine rake planting beds prior to planting shrubs.

C. Notification: Submit written notification of all conditions inconsistent with specifications for soil preparation and mixing as described in Section 32 9113 - Soil Preparation.

3.02 DRAINAGE OF PLANTING AREAS

A. Surface Drainage: See Fine Grading - Section 02210

3.03 LAYOUT AND EXCAVATION OF PLANTING AREAS

A. Layout and Staking: Lay out all trees, shrubs and container locations as shown on Drawings. Owner and Landscape Architect reserves the right to review and adjust plant locations.

B. Review: Locations of plants will be checked in the field and will be adjusted to exact position before planting begins. Right is reserved to refuse review at this time if, in the Landscape Architect's opinion, an insufficient quantity of plants is available.

C. Equipment for Digging Plant Pits: Use of an auger or vernier spade to dig plant pits is prohibited. Backhoe is acceptable, with scarification of the tree pit after excavation - see below.

D. Plant Pits: Excavate tree and shrub to a minimum of twice the diameter of the ball or container, in accordance with Drawings.

3.04 PLANTING OPERATIONS

A. General:

1. Protect plants at all times from sun or drying winds.
2. Keep plants that cannot be planted immediately upon delivery in the shade, well-protected and well-watered.
3. Heel in and protect with burlap all B&B plant materials which cannot be planted upon delivery.

B. Handling and De-potting of Plant Materials:

1. Metal Containers: Cut can on two sides with accepted cutting tool. Do not use spade.
2. Plastic Containers: Tip container to horizontal orientation and carefully remove shrub. Support rootball during installation to prevent cracking or shedding of soil.
3. Balled and Burlap Plants: Avoid all damage to rootballs. If rootball is cracked or broken during handling, plant will be rejected. Lift and carry by bottom of ball only. Do not remove wrapping until plant is set in plant pit. Cut and remove all wire completely from around root ball and peel burlap away from upper 1/3 of rootball prior to backfilling.

C. Installation:

1. Scarification:
   a. Plant Rootball: After removing plant from container, scarify the sides of the rootball to a depth of 1 in. at four to six equally-spaced locations around the perimeter of the ball. Completely sever or remove all circling roots over 3/8 in. diameter.
   b. Plant Pit: Excavate deep enough to accommodate the ball and bed (no less than 6" depth) of prepared back fill mix. Compact before setting of plants. Scarify sides of plant pit, thoroughly breaking up all surfaces and eliminating all "glazed" areas.
2. Positioning: Backfill plant pit as required to allow setting crown of plant 2 in. above new finish grade. Thoroughly foot tamp all backfill. Position plant in planting pit, maintaining plumb condition.
3. Backfilling:
   a. Use backfill mix as specified in Section 02920 - Soil Preparation, to backfill plant pits. Brace each plant plumb and rigidly in position until planting soil has been tamped solidly around the ball and roots.
   b. When plant pits have been backfilled approximately 2/3 full, water thoroughly and saturate rootball, before installing remainder of the backfill mix to top of pit, eliminating all air pockets.
4. Staking and/or Guying: When required, stake or guy as detailed.

D. Adjustment: Adjust plants so that after full settlement has occurred, the grade at the base of the plants is 2 in. above the adjacent planting finish grade.

E. Watering Basin: Form saucer with 3 in. high berm centered around tree and shrub pits 12 in. wider than ball diameter.

F. Watering: Water all plants immediately after completion of planting operations.

G. Labels: Remove all nursery-type plant labels, wires and ties from plants.

3.05 STAKING AND GUYING

A. General:

1. Trees shall be able to stand upright without support, and shall return to the vertical after their tops have been deflected horizontally and released. Stake or guy trees which do not meet this qualification.
2. All plant materials shall remain plumb and straight for all given conditions from installation through the guarantee period.

B. Staking (Deciduous Trees):

1. Locate stakes in a line with trunk of tree, perpendicular to prevailing wind and as close to the main trunk as is practical, avoiding root injury. Drive stakes at least 30 in. into firm ground. See Planting Details.
2. Wire support straps shall be placed around the trunk in a single loop. Run wire through grommets on support strap, tighten, and keep taut.

C. Guying (Evergreen Trees):

1. Guy Evergreen trees at points of branching height of tree, with three (3) guys spaced equally around and outside perimeter of ball, in accordance with Drawings.
2. Guys: Provide one turnbuckle for each guy. Use 2 cable clamps at each cable connection. Place Plastic Guy Covers on all guys.

3.06 PRUNING: See Section 32 0130 - Landscape Maintenance

3.07 MULCHING

A. Install a 2 in. deep layer of specified mulch over all planting areas including tree and shrub watering basins unless otherwise noted on drawings.

3.08 GROUNDCOVER AND PERENNIAL PLANTING

A. Planting: Plant groundcover plants at optimum depth for proper growth. Avoid air pockets. Equally spaced triangularly, at distances called for in the Drawings. See Planting Details.

B. Fertilizers: Apply top-dress fertilizer at the rate of 3 pounds per 1,000 square feet immediately after planting.

C. Watering: Water bed thoroughly after fertilizer application. Wash all fertilizer from leaves of plant materials.

3.09 BULB

A. Bulbs: Install per generally accepted standards for specific species. Depths will vary by species.

B. Location: Locate per direction of Landscape Architect.

3.10 CLEAN-UP

A. Keep all areas of work clean, neat and orderly at all times.

B. Clean up and remove all deleterious materials and debris from the entire work area prior to Final Acceptance.

END OF SECTION

SECTION 02970

LANDSCAPE MAINTENANCE

PART 1 - GENERAL

1.01 DESCRIPTION

A. Related Requirements: Review the General Contract Conditions and Division One, General Requirements, which contain information and requirements that apply to this Section.

B. Work Included: Provide Landscape Maintenance, complete as specified.

1. Work in this Section includes, but is not limited to, furnishing all labor, materials, equipment and incidentals needed to provide complete landscape and irrigation maintenance program to the Owner during the installation period and for (90) days following date of Final Acceptance. Maintenance items shall include all items constructed under this Contract.
2. Work specifically included for maintenance includes:
   a. Watering, pruning, weed control and replacement of mulch for trees, shrubs, groundcovers, and perennials.
   b. Mowing, edging, fertilization, watering and weed control within turf areas.
   c. Winter watering as required.
   d. Monthly site inspection of potential insect, pest and disease problems and filing of monthly status report.
   e. Weekly clean-up of trash, litter and debris.
3. Work which may be required under this Section, but which if required will be considered a claim for extra work (see General Conditions), include the following:
   a. Insect, pest and disease control.
   b. Plant replacement due to theft, vandalism, or accidental damage by others after final acceptance. (Supplemental unit prices will apply for one (1) year following final acceptance).
   c. Repair of damages to the irrigation system which have not been caused by Contractor's maintenance practices or negligence.

C. Related Work in Other Sections:

Soil Preparation - Section 02916
Seeding - Section 02922
Trees, Shrubs and Groundcover - Section 02930

1.02 QUALITY ASSURANCE

A. Requirements of Regulatory Agencies

1. Perform all work in accordance with all applicable laws, codes, and regulations required by authorities having jurisdiction over such work.
2. Provide for all inspections and permits required by Federal, State, or local authorities in furnishing, transporting, and installing of all agricultural chemicals.

B. Applicable Standards: Workmanship and overall maintenance program shall conform to the highest level of industry standards.

C Work Force:

1. Experience: The landscape maintenance firm shall have a full time foreman assigned to the job for the duration of the contract. He shall have a minimum of four years experience in landscape maintenance supervision, with experience or training in entomology, pest control, soils, fertilizers and plant identification.
2. Labor Force: The landscape maintenance firm's labor force shall be thoroughly familiar and trained in the work to be accomplished and perform the task in a competent, efficient manner acceptable to the Owner.
3. Supervision: The foreman shall directly employ and supervise the work force at all times. Notify Landscape Architect of all changes in supervision.
4. Identification: Provide proper identification at all times for landscape maintenance firm's vehicles and labor force.

1.03 SUBMITTALS

A. Submit two (2) copies each of the following items:

1. Schedule of maintenance operations and monthly status report including list of all equipment and materials proposed for the job.
2. All licenses and insurances required by the local governing authority and the State of Vermont pertaining to this work.
3. Monthly record of all herbicides, insecticides and disease control chemicals used for the project.

1.04 PROJECT CONDITIONS

A. Site Visit: At beginning of maintenance period, visit and walk the site with the Landscape Architect to clarify scope of work and understand existing project/site conditions.

B. Documentation of Conditions: Document general condition of existing trees, shrubs, vines, groundcovers and lawn recording all plant materials which are damaged or dying, if any.

C. Irrigation System: Document general condition of existing irrigation system, making sure that faulty electrical controllers, broken or inoperable sprinkler heads or emitters are reported.

1.05 SCHEDULING

A. Perform all maintenance during hours mutually agreed upon between Owner and Contractor.

B. Work force shall be present at the project site at least once a week and as often as necessary to perform specified maintenance in accordance with the approved maintenance schedule.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. Fertilizers:

Sierra Chemical Company
1001 Yosemite Drive
Milipitas, CA 95035
(408) 263-8080

W.R. Grace and Co.
Agricultural Chemicals Group
Memphis, TN 38101

BFC Chemicals, Inc.
Wilmington, DE 19805
Or Approved Equal Product

B. Herbicides:

Chevron Chemical Company
575 Market Street
San Francisco, CA 94105
(415) 894-0880

Rhone-Poulenc Chemical Company
Agro Chemical Division
P.O. Box 125
Mon Mouth Junction, NJ 08852
(201) 297-0100

Ciba-Geigy Corporation
Agricultural Division
P.O. Box 1830
Greensboro, NC 27419
(919) 292-7100

Elanco Products Company
740 S. Alabama St.
Indianapolis, IN 46285
(317) 261-3638

The DOW Chemical Company
P.O. Box 1706
Midland, MI 48640
(517) 636-0236

3M Company-Agri Chemicals Project
3M Center, Bldg. 223-6SE
St. Paul, MN 55144
(317) 261-3000

Or Approved Equal Product

2.02 MATERIALS

A. General: All materials and equipment, unless otherwise indicated, shall be provided by the Contractor.

B. Water: Clean, potable and fresh, furnished and paid for by the Owner.

C. Fertilizers:

1. Tightly-compressed, slow-release and long-lasting complete fertilizer tablets bearing

manufacturer's label of guaranteed analysis of chemicals present.

2. Balanced, once-a-season application controlled-release fertilizers with a blend of coated prills which supply controlled-release nitrogen, phosphorus and potassium, and uncoated, rapidly soluble prills containing nitrogen and phosphorous.

D. Herbicides, Insecticides, and Fungicides:

1. Obtain best quality materials with original manufacturers' containers, properly labeled with guaranteed analysis.
2. Use non-staining materials.

E. Annuals/Perennials: Nursery-grown in 4 in. or 6 in. pots, full, healthy plants just ready to bloom.

F. Lawn Seed for Reseeding: Match seed mix specified for project..

G. Replacement Tree Guys, Stakes, Ties and Wires: Match existing materials on the site. Provide detail(s) in 8-1/2 in. x 11 in. format if necessary.

PART 3 - EXECUTION

3.01 GENERAL

A. Duration: Continuously maintain each plant and each portion of groundcover area after installation, during progress of work, and for a period of 90 days after completion of all planting work until Final Acceptance.

B. Protection:

1. Protect all planting areas from damage of all kinds from beginning of work until Final Acceptance.
2. Maintenance includes temporary protection fences, barriers and signs as required for animal protection.

C. Replacements:

1. Immediately treat or replace all plants which become damaged or injured as a result of Contractor's operations or negligence, as directed by Landscape Architect at no additional cost to Owner.
2. Replacement plants shall be of acceptable size, condition and variety.

3.02 TREES, SHRUBS AND VINES

A. Watering Basins:

1. Maintain all watering basins around plants so that enough water can be applied to establish moisture through major root zones.
2. For supplemental hand watering of watering basins, use a water wand to break the water force. Do not permit crown roots to become exposed to air through dislodging of soil and mulch.
3. Maintain originally called for depth of mulch to reduce evaporation and frequency of watering.
4. In rainy season, open basins to allow surface drainage away from the root crown where excess water may accumulate. Restore watering basins at end of rainy season.

B. Resetting: Reset plants to proper grades or upright position.

C. Weed Control:

1. All areas between plants, including watering basins, shall be weed free.
2. Control weeds through proper cultural practices including cultivation, hand removal and hoeing, being careful to avoid damage to plant material.

D. Pruning:

1. Prune trees to select and develop permanent scaffold branches that are smaller in diameter than the trunk or branch to which they are attached, and which have vertical spacing of 18 in. to 48 in. in radial orientation so as not to overlay one another.
2. Prune trees to eliminate diseased or damaged growth, and narrow V-shaped branch forks that lack strength. Reduce toppling and wind damage by thinning out crowns.
3. Prune trees to maintain growth within space limitations, maintaining a natural appearance and balancing crown with roots.
4. Stripping of lower branches ("raising up") of young trees will not be permitted.
5. Retain lower branches in a "tipped back" or pinched condition to promote caliper trunk growth (tapered trunk). Do not cut back to fewer than six buds or leaves on such branches. Only cut lower branches flush with the trunk after the tree is able to stand erect without staking or other support.
6. Thin out and shape evergreen trees when necessary to prevent wind and storm damage. Do primary pruning of deciduous trees during the dormant season. Do not permit any pruning of trees prone to excessive "bleeding" during growth season.
7. Prune damaged trees or those that constitute health or safety hazards at any time of year as required.
8. Make all cuts clean and close to the trunk, without cutting into the branch collar. "Stubbing" will not be permitted. Cut smaller branches flush with trunk or lateral branch. Make larger cuts (1 in. in diameter or larger) parallel to shoulder rings with the top edge of the cut at the trunk or lateral branch.
9. Branches too heavy to handle shall be precut in three stages to prevent splitting or peeling of bark. Make the first two cuts 18 in. or more from the trunk to remove the branch. Make the third cut at the trunk to remove the resulting stub.
10. Do not prune or clip shrubs into balled or boxed forms unless specifically called for by design.
11. Clip shrubs to be hedged when branches project 2 in. beyond limit of clipped hedge shown on the Drawings.

E. Staking or Guying of Trees:

1. Inspect stakes and guys at least once a month to check for rubbing that causes bark wounds.

2. Conform to the recommended procedures of staking and guying as outlined in Section 32 9300 Trees, Shrubs and Groundcovers.

F. Maintenance of Existing Trees and Shrubs to Remain:

1. General: Conform to all applicable paragraphs regarding pruning, watering, spraying and fertilizing of new plant materials as specified in this section.
2. Be alert to symptoms of construction damage to root systems of existing trees and shrubs

as evidenced by wilting, unseasonal or early flowering or loss of leaves, and insect or disease infestation due to declining vigor.

3. Give notification in writing of all evidence of declining tree or shrub vigor immediately upon discerning the problem. Take appropriate interim measures to mitigate the severity of the problem as specified in this section.
4. Submit written proposal and cost estimate for the correction of all conditions before proceeding with permanent correction work.

3.03 GROUNDCOVERS

A. Watering:

1. Check for moisture penetration throughout the root zone at lease twice a month.
2. Water as frequently as necessary to maintain healthy growth of groundcovers.

3.04 LAWNS

A. Watering:

1. Water lawns at such frequency as weather conditions require, to replenish soil moisture to 6 in. below root zone.
2. Provide a total of 2 in. of water weekly during hot summer weather, in three (3) applications per week.
3. Water at night if irrigation system is electrically controlled. Otherwise, watering shall be done during early mornings.

B. Weed Control:

1. Control weeds through proper cultural practices including cultivation, hand removal and hoeing.

C Mowing and Edging:

1. Mow lawns when they reach 2 in. high.

D Reseeding of Lawn Areas: Match existing seed mix of adjacent areas.

E Renovating:

1. Top Dress Fertilizer: See Section 02930 - Lawns and Grasses.

3.05 SEEDED GRASSES

A Watering:

1. Water lawns at such frequency as weather conditions require, to replenish soil moisture to 6 in. below root zone.
2. Provide a total of 1 in. of water weekly during hot summer weather, in one (2) applications per week.
3. Water at night if irrigation system is electrically controlled. Otherwise, watering shall be done during early mornings.

B. Weed Control:

1. Control broadleaf weeds, primarily Canadian Thistle with selective herbicides.
2. In areas where crabgrass has infested the lawn, apply a selective post-emergent herbicide as soon as possible, and prior to flowering.

3. Apply pre-emergent herbicides such as Dacthal, Balan, or Betasan prior to crabgrass germination.
4. Do not irrigate for 48 hours after application of all herbicide sprays.
5. Coordinate application of herbicides with thatch control and reseeding schedule as described below.

C. Mowing and Edging:

1. Mow grasses as directed by the Owner.

D. Reseeding of Lawn Areas: Match existing seed mix of adjacent areas.

E. Renovating:

1. Top Dress Fertilizer: Top dress with 1/4" of compost in early spring.

3.06 ANNUALS AND PERENNIALS

A. Watering:

1. Species, sizes of plants, container sizes and orientation shall dictate frequency of watering. Submit to Owner a watering schedule for different seasonal requirements.

B. Weed Control: All planting beds with annuals and perennials shall be weed-free at all times.

C. Pruning:

1. Limit pruning to removal of damaged or dead twigs and foliage.
2. Remove spent flowers on a weekly basis.

D. Replacements of Annuals:

1. Replace annuals when materials exhibit a "spent" condition.
2. Thoroughly cultivate soil after removal of "spent" or "dead" plants prior to planting new materials.
3. Incorporate slow release fertilizers and rake smooth.

3.07 INSECTS, PESTS, AND DISEASE CONTROL

A. Inspection: Inspect all plant materials for signs of stress, damage and potential trouble from the following:

1. Presence of insects, moles, voles, gophers, ground squirrels, snails and slugs in planting areas.
2. Discolored or blotching leaves or needles.
3. Unusually light green or yellowish green color inconsistent with normal green color of

leaves.

B. Personnel: Perform spraying for insect, pest and disease control only by licensed, qualified, trained personnel.

C. Application: Spray with extreme care to avoid all hazards to any person or pet in the area or adjacent areas.

3.9 THE 90 DAY MAINTENANCE PERIOD

A. Preliminary Review: As soon as all plantings are completed per Contract Documents, hold a preliminary review to determine the condition of the work.

B. Date of Review: Submit a written request at least five (5) working days prior to anticipated date of review.

C. Beginning of the 90 Day Maintenance Period: The date on which the Landscape Architect issues a letter of Preliminary Acceptance to the Contractor.

3.10 FINAL ACCEPTANCE

A. Acceptance:

1. Work will be accepted by the Landscape Architect upon satisfactory completion of all work, including maintenance period, but exclusive of replacement of materials under the Warranty Period.
2. Submit a written request to Landscape Architect for review of Final Acceptance at least five (5) working days prior to anticipated Final Review date, which is at the end of the Maintenance Period.

B. Corrective Work:

1. Work requiring corrective action or replacement shall be performed within ten (10) calendar days after the Final Review.
2. Perform corrective work and materials replacement in accordance with the Drawings and Specifications, and shall be made by the Contractor at no cost to the Owner.
3. After corrective work is completed, the Contractor shall again request a Final Review for Final Acceptance as outlined above.
4. Continue maintenance of all landscaped areas until such time as all corrective measures have been completed and accepted.

C. Conditions for Acceptance of Work at End of Maintenance Period:

1. Each plant shall be alive and thriving, showing signs of growth and no signs of stress, disease, or any other weaknesses.
2. All plants not meeting these conditions shall be replaced and a 90 Day Maintenance Period commenced for such plants.

D. Final Acceptance Date: The date on which the Landscape Architect issues a Letter of Final Acceptance. Upon Final Acceptance, the Owner will assume responsibility for maintenance of the work.

3.11 WARRANTY PERIOD AND REPLACEMENTS OF PLANT MATERIALS

A. Specific Requirements:

1. Seeding and Sodding - Refer to Section 32 9200.
2. Trees, Shrubs and Groundcover - Section 32 9300.
   a. Vigor: Warrant that all trees and shrubs planted under this Contract will be healthy and in flourishing condition of active growth one year from date of Final Acceptance. Similarly warranty perennial and groundcover for one full growing season from date of Final Acceptance.
   b. Condition of Plants: Plants shall be free of dead or dying branches and branch tips, with all foliage of a normal density, size and color.
   c. Replacements: As soon as weather conditions permit, replace, without cost to Owner all dead plants not in a vigorous, thriving condition, as determined by Project Manager during and at the end of Warranty Period. Replacement trees shall extend warranty period correspondingly for one year from date of replacement planting.
   d. Exclusions: Contractor shall not be held responsible for failures due to neglect by Owner, vandalism, etc., during Warranty Period. Report such conditions in writing to the Landscape Architect.
3. **Warranty period shall begin when Landscape Architect issues letter for Final Acceptance.**

END OF SECTION