

SECTION 32 90 00
PLANTING

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Scope of Work - Plantings: This work consists of furnishing and installing all planting materials required for landscaping hereinafter specified in locations as shown. Provide all landscape plantings of every description, as required by the Drawings. The work included consists of but is not limited to the following:
1. Exterior Plantings: Furnish and install, maintain, and warranty all trees and plantings, including shrubs, vines, perennials, and groundcovers.
 - a. Designated plantings will be pre-tagged by the Landscape Architect. The Contractor will make all arrangements for handling, shipping and receiving materials. The Contractor will bear the cost of the plant materials and shipping. These pre-tagged materials will be received, installed, maintained and warranted per these specifications.
 2. Mulch: Provide specified mulches.
 3. Supports: Provide all guys, stakes and other supporting appurtenances to maintain plants in a plumb and straight position. No initial guying or staking shall be required.
 4. Water Supply: Provide all required temporary water supply from source(s) provided by Owner.
 5. Warranty: Warrant plantings for a period of one year from substantial completion inspection.
 6. Initial Maintenance: Maintain all plantings until substantial completion.
- B. Scope of Work - Sod at Grade: Provide all sod in areas indicated on the Drawings, and as specified herein. Sod shall be referred to as Sod.
1. Water Supply: Provide all required temporary water supply from source(s) provided by Owner.
 2. Warranty: Warrant sodded areas for a period of one year from substantial completion inspection.
 3. Initial Maintenance: Maintain all sod until substantial completion.
- C. Scope of Work Soil Preparation and Placement: Furnish all materials and labor required to complete all soil preparation and installation work shown on the Drawings and specified herein, including but not limited to:

1. Soil Tests: Supply required soil test data on representative samples taken from the proposed topsoil, sand, and topsoil/ sand mix, as described herein.
 2. Soil Preparation: Provide specified topsoil mix as required to meet finish grade elevations. Soil mix shall consist of sand, and required soil amendments, including fertilizers and pH adjusters. Mix topsoil, sand, pH adjusters, fertilizers, and other amendments as required by Landscape Architect after analysis of soil test data.
 3. Placing Soil Mix: Provide, place and spread amended soil planting mix to depths shown on Drawings and to meet final finished grades.
 4. Finish Grading: Rake soil mix smooth and meet required finished grades within tolerances specified herein.
- D. Unit Price Work: Provide a unit price (per c.y.) at time of bid to import, test, amend and install supplemental topsoil.
- E. Sequence of Work: Contractor's bid shall include all cost increases due to delays in construction, including nursery price increases for material held beyond anticipated schedule.
- F. First Year Maintenance: Provide landscape maintenance specified herein for all trees and plantings shown on the Drawings, from substantial completion for a period of twelve months.

1.2 EQUIPMENT

- A. Maintain all equipment, tools and machinery while on the project in sufficient quantities and capacity for proper execution of the work.

1.3 QUALITY ASSURANCE

- A. Installer Qualifications: A single pre-approved Landscape Contractor with a minimum of 3 years experience on comparable project.
- B. Conformance with Laws: Comply with any State or Federal laws including regarding inspection of plant materials, sod for plant diseases and insect infestation. Use of horticulturally appropriate chemicals for treatment and any required inspection certificates shall accompany each shipment and on arrival, be filed with the Landscape Architect. It shall be the Contractor's responsibility to research any laws regarding the transportation of materials across state lines, and he shall conform. The Department of Agriculture, Division of Plant Industries, may have such information.
- C. Warranty - Plants: Warrant that all work in this section shall be free from defects of materials and workmanship for a period of one (1) year from the date of substantial completion of the project. Warrant all plant materials, including pre-tagged or pre-purchased materials, for a period of one year from the date of acceptance to be in good, healthy and flourishing condition. Correct any imperfect work whenever discovered until termination of warranty obligations. When the work is accepted in part, the warranty periods extend from each of the partial

TADI

VA 578-12-090

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17MAY12 (AMENDMENT 1)

acceptances to the terminal date of the last warranty period. Thus, all planting and sod warranty periods terminate at one time. The Contractor shall and warranty that all work in this section shall be free from defects of materials and workmanship. Maintain each area until Substantial Completion and the warranty period is formally started. Maintenance shall begin immediately upon delivery to the site and as each portion is installed, and shall continue for the specified period. The Owner will re-inspect all plants and sod at the end of the One Year Warranty.

- D. Warranty - Sod: Warrant Sod to be free from defects through 3 cuttings.
- E. Warranty - Soil: Warrant the final grades to be smooth and uniform according to the elevations and contours shown on the drawings, for a period of one year. Any irregularities shall be repaired, including any work repaired as a result of his work.
 - 1. Drainage Problems: If during the warranty period of one year, any drainage problems arising from Contractor's work; such as, but not limited to, low spots, slides, gullies and general erosion; the Contractor shall repair these areas as well as other work which may be damaged by these problems. All work shall be returned to a condition equal to their original specified conditions and shall assume future reoccurrence of drainage problems.
 - 2. Slopes: The Contractor shall be responsible for the stability of all finish grades and for all topsoil added to existing slopes under their contract. Contractor shall replace any which has become displaced due to carelessness or negligence on his part. The Contractor shall also take the appropriate steps, and provide the necessary protections to prevent the future reoccurrence of these problems as described above.
- F. Codes and Standards: Perform the mixing, transport, placement, and grading of soils and soil mixes in compliance with the requirements of the governing authorities having jurisdiction, except where more stringent requirements are shown on the Drawings or specified herein.
- G. Soil Testing: As soon as possible upon award of contract, employ at no additional expense a soil testing agency acceptable to the Landscape Architect. Using methods approved by the Association of Agricultural Chemists, conduct all tests, interpret results and prepare reports specified herein for supplemental topsoil. Soil tests shall indicate the mechanical make up of the soil according to the percentages of silt, clay, and sand. Each report shall state whether or not the test specimens conform to all requirements of the Contract Documents, and shall specifically note any deviations there from. Contractor shall secure this test in a timely fashion. On the basis of the above tests, soil amendments other than those specified herein may be authorized.
- H. Acceptance Procedure:

TADI

VA 578-12-090

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17MAY12 (AMENDMENT 1)

1. Completion of Work: Upon completion of the work, a review will be made by the Landscape Architect upon written notice requesting such a review submitted by the Contractor at least ten (10) days in advance of the anticipated date. The purpose of the review shall be to determine whether or not the Contractor has completed all of the work of this contract, including maintenance of all planted and sodded areas.
2. Review for Substantial Completion for Plantings: This review shall take place at the same time as the completion of work review. The Landscape Architect will review to begin the warranty of planting areas on the date requested, by the Contractor, as above specified, or as soon thereafter as possible. If the work is found to be in compliance with the Contract Documents, the Landscape Architect will notify in writing the Contractor and Owner of the beginning of the warranty period. The Contractor shall prepare an initial punch list for the Landscape Architect's review, noting any plant not in healthy condition at this time, recommending changes in maintenance procedures and creating a list for replacements. Contractor and Landscape Architect shall then review the work together on-site.
3. Substantial Completion Inspection for Sod: The Landscape Contractor and Landscape Architect shall complete the Substantial Completion inspection to determine sod not in conformance to plans and specifications. This inspection shall take place at the same time as the substantial completion review, and after at least one mowing of sod. The Landscape Architect will make a review to begin the warranty of sod areas on the date requested, by the Contractor, as above specified, or as soon thereafter as possible. If the work is found to be in compliance with the Contract Documents, the Architect will notify in writing the Contractor and the Owner of the beginning of the warranty period. The Contractor shall prepare an initial punch list for the Landscape Architect's review, noting any areas of sod not in healthy condition at this time, recommending changes in maintenance procedures and creating a list of replacement areas. Contractor and Architect shall then review the work together on-site.
4. Maintenance Review for Plantings: Maintenance review and substantial completion review shall take place simultaneously, if possible with the substantial completion inspection. If planting areas are found to be defective, make necessary replacements, continue initial maintenance for ten days, and request another inspection.
5. Maintenance Review for Sod: The Landscape Architect and Contractor shall make an inspection to determine whether landscape contractor is maintaining the landscape installation according to maintenance specification. Maintenance review and substantial completion review shall take place simultaneously, if possible. If sod areas are found to be defective, make necessary replacements, continue initial maintenance for at least another set of mowings, and request

TADI

VA 578-12-090

1 8 A P R 1 2 3 2 9 0 0 0 - 4

17MAY12 (AMENDMENT 1)

another inspection.

6. Warranty Period: Make periodic inspections during the warranty period to determine what changes should be made to the maintenance program. Submit in writing to the Landscape Architect any recommended changes. Upon completion of the warranty period submit a request for a review at least ten (10) days in advance of the anticipated date.
7. Review for Final Acceptance: The Landscape Architect will make a review for Final Acceptance of the Contract work, including maintenance but exclusive of replacements. If the work is found to be in compliance, the Landscape Architect will recommend acceptance by the Owner, exclusive of possible replacement of plants and/or sod subject to warranty. If there are any deficiencies in the maintenance, the Contractor will be notified of these deficiencies in writing and the work shall be subject to re-review before acceptance.

1.4 SUBMITTALS

- A. General: Submit descriptions of materials to the Landscape Architect. For samples of plant materials see "Review" hereinafter. Submit descriptions of organic fertilizer, commercial fertilizer, burlap, and each source of supply prior to the beginning of work under this Section. Delivery of materials may begin only after descriptions or samples have been approved.
- B. Soil Tests: Prior to mixing, take soil samples and have soil tests performed for the required samples. Provide Landscape Architect with report of results of tests as described herein. Based on the results of these soil tests, the Landscape Architect will determine which soil amendments and in what quantities will be mixed into the soil mix. If the topsoil tested and proposed for use by the Contractor is unacceptable to the Landscape Architect, the Contractor will find and procure soil tests for alternative topsoils until one is found that is acceptable to the Landscape Architect. Contractor shall not place any topsoil on site without prior approval by Landscape Architect.
 1. Required Test: One Chemical Analysis and one Mechanical Analysis Test specified hereunder of each sample. Provide pH test (only) for sand.
 2. Required Sample: One sample each taken from on site stockpiled topsoil.
 - a. Stockpiled topsoil, if available.
 - b. Proposed supplemental topsoil.
 - c. Sand.
 3. Retest until results are acceptable.
- C. Soil Test Results: Bind all test results into a report and submit in duplicate to the Landscape Architect the following:
 1. Chemical Analysis: A full chemical analysis of the soil including

TADI

VA 578-12-090

1 8 A P R 1 2 3 2 9 0 0 0 - 5

17MAY12 (AMENDMENT 1)

pH, cation exchange capacity (CEC), Organic Matter (OM), phosphorous, total and available potassium, and essential nutrients, including trace elements, and any harmful residual chemicals.

- a. On topsoil which has had crops grown on it at any time during the last two years, provide test results for triazine and di-nitro-aniline herbicides.
 - b. On soil which is taken from a location within 200 feet of a road wider than two lanes, provide a test for soluble salts.
2. Mechanical Analysis: A mechanical analysis giving content by percent of clay, silt, and sand.
3. Lab Recommendations: Provide Testing Laboratory's recommendations for amending and fertilizing the soil, as well as any toxicity comments.
- D. Samples: Submit one quart size plastic container of proposed materials be used in soil mix with submittal of soil test data report.
1. Stockpiled topsoil, if any proposed for use.
 2. Proposed supplemental topsoil.
 3. Sand.
 4. Pine bark fines.

E. Plants:

1. Review: The Landscape Architect reserves the right to tag and/or review plant material for specified quality, size and variety, at place of growth, upon delivery to the site, or during progress of the work. All materials furnished for the work shall conform in every respect to reviewed samples. Plants which do not conform shall be removed from the site and immediately replaced with conforming material at Contractor's expense.
 - a. Pre-Tagging Material: The Landscape Architect and Contractor shall tag all material as soon as possible to be held until time of installation. All deposits required for material being held a season will be reimbursed by the Owner upon submittal of documentation of expenses.
2. Certificates: Furnish Certificates of Inspection as may be required by law to accompany shipments.
3. All plant material must be grown in zones similar to the project site and no further than 100 miles from site.

F. Mulches:

1. Bark Mulch: Submit sample of specified bark mulch to Landscape Architect for review prior to placement of mulch. Sample shall be submitted in plastic bag equal to one quart size, sealed and labeled as to contents, name, brand, type, and supplier.
2. Gravel Mulch: Submit 1 quart of specified gravel, sealed and labeled

TADI

VA 578-12-090

1 8 A P R 1 2 3 2 9 0 0 0 - 6

17MAY12 (AMENDMENT 1)

as above.

3. Steel Edge: Submit sample one foot length prior to installation.
- G. Sod Source: Submit supplier name and certification of sod content to Landscape Architect, including location of supplier.
- H. Sod Review: The Landscape Architect reserves the right to review sod for specified quality and variety, upon delivery to the site or during the progress of the work. All sod furnished for the work will conform in every respect to the reviewed samples. Sod which does not conform will be removed from the site and immediately replaced with specified material at the Contractor's expense.
- I. Certificates: Furnish required certificates accompanying shipments.
- J. Certificates of Conformance or Compliance: Before delivery, notarized certificates attesting that the following materials meet the requirements specified shall be submitted to the Landscape Architect for approval:
 1. Plant Materials: Department of Agriculture certification by State Nursery Inspector declaring material to be free from insects and disease.
 2. Fertilizers.
 3. Sod.
- K. Manufacturer's Literature and Data:
 1. Metal edging.
 2. Anti-desiccant.
 3. Erosion control materials.
 4. Proposed herbicides, insecticides or other horticultural chemicals.
 5. Geotextile fabric.
- L. Licenses: Submit one copy of License for Illinois Certified Arborist to the Resident Engineer.
- M. Lab Results and Recommendations: Soil laboratory testing results and any soil amendment recommendations from the testing laboratory.
- N. Required Maintenance Instruction: Submit a report detailing recommended maintenance up until substantial completion inspection.

1.5 DELIVERY AND STORAGE

- A. Delivery:
 1. Notify the Landscape Architect of the delivery schedule in advance so the plant material may be inspected upon arrival at the job site. Remove unacceptable plant material from the job site immediately.
 2. Deliver fertilizer to the site in the original, unopened containers bearing the manufacturer's warranted chemical analysis, name, trade name or trademark, and in conformance to state and federal law. In

TADI

VA 578-12-090

1 8 A P R 1 2 3 2 9 0 0 0 - 7

17MAY12 (AMENDMENT 1)

lieu of containers, fertilizer may be furnished in bulk and a certificate indicating the above information shall accompany each delivery.

- B. Delivery Handling and Storage of Soil Mix Materials: Do not deliver, amend, place, spread, or grade topsoil while in a frozen or muddy condition. Coordinate staging areas for soil mix materials with General Contractor.
- C. Pre-tagged Plant Materials: The Contractor shall arrange and be responsible for the successful moving of all plant materials which are pre-purchased by the Owner. Arrange for plant materials to be picked up and shipped from the nursery to the site, or an alternative off-site location if the site is not ready. Take up all questions regarding plant material shipping with the nursery prior to shipment taking place. Document all conversations with the nurseryman and submit to the Landscape Architect prior to shipment. Plants shall be dug, handled, shipped, held, and maintained at a location acceptable to Landscape Architect as specified herein.
1. Shipped Material: Protect carefully all plant material which is shipped from heat, freezing, desiccation and injury during transport.

D. Plants:

1. Digging: Do not dig plants until inspections are made. Balled and burlapped plants (B&B) shall be dug with firm, natural balls of earth of sufficient diameter and depth to include all fibrous and feeding roots. Treated burlap or nylon ropes around balls are not acceptable. Plants to be transplanted shall be balled and burlapped. See Drawings for additional information regarding digging.
2. Handling: Neither tagging nor delivery shall constitute acceptance of plants. Handle plant so as to avoid damage to any of its parts. Broken branches, bruised bark, broken balls or other damage shall constitute grounds for rejection. Handle plants from bottom of root ball only. Protect all plants from drying out. Plants that cannot be planted immediately or within 24 hours from delivery shall be kept in the shade, well protected, and moist. Do not transport plant materials in sub-zero weather. No plant with a frozen ball shall be accepted.
- a. Balled and Burlapped Plants: Carefully set and protect balled and burlapped plants with wet soil or moss until planting.
- b. Container Plants: Protect plants in their containers until time for planting, and then remove from their containers with a can cutter, not an axe or spade.
3. Pruning: Do not prune before delivery or prior to planting or transplanting. New plants which show evidence of having been pruned or new trees which have fresh cuts of limbs over 1-1/4" not completely

calloused shall be rejected.

- E. Sod Handling: Transport sod either in a closed van or in open truck which has been properly covered. Deliver and install within a period of 48 hours. Do not harvest or transplant when moisture content (excessively dry or wet) may adversely effect sod survival. Protect sod from exposure to sun, wind and freezing prior to placing. Sod shall be in a moist condition at the time of cutting and until it is placed. Any sod that has dried out shall be immediately removed from the job site and replaced per specifications.
- F. Maintenance Materials: Deliver anti-desiccant spray in containers of the manufacturer; mix and use according to manufacturer's direction. Deliver insecticide spray in the manufacturer's containers; mix and spray according to manufacturer's directions. Deliver fungicide in manufacturer's containers; mix and apply according to manufacturer's directions only with the acceptance of the Landscape Architect. Deliver herbicide in the manufacturer's containers; apply per manufacturer's directions, only with the acceptance of the Landscape Architect.
- G. Soil Separator: Handle and store soil separator per manufacturer's instructions. Handle separator with care so as not to stretch or tear the fabric. Store out of the direct rays of the sun in its wrapper until use.
- H. Confirm Water Source: Landscape Contractor shall confirm water source and that there is sufficiently supplied moisture during the establishment period.
- I. Protection of the Work. Landscape Contractor shall protect newly sodded areas from damage by other trades or mechanical damage and pedestrian traffic - fencing shall be installed if necessary.
- J. Other Materials: Store all other materials so as to keep them clean and protected from damage, according to manufacturer's recommendations.
- K. Storage:
 - 1. Keep fertilizer in dry storage away from contaminants.
 - 2. Store plants not installed on the day of arrival at the site as follows:
 - a. Shade and protect plants from the wind when stored outside.
 - b. Protect plants stored on the project from drying out at all times by covering the balls or roots with wood chips, shredded bark, or other similar mulching material.
 - c. Keep plants, including those in containers, in a moist condition until planted, by watering with fine mist spray.

1.6 JOB CONDITIONS

- A. Availability of On-Site Topsoil: There is insufficient on-site stockpiled topsoil. Provide supplemental topsoil for landscape plantings soil mixes and to achieve intended finish grades. Landscape Contractor shall

TADI

VA 578-12-090

1 8 A P R 1 2 3 2 9 0 0 0 - 9

17MAY12 (AMENDMENT 1)

coordinate mixing and placement of all proposed topsoil with project General Contractor.

1. Most topsoil shall be imported supplemental topsoil.

B. Planting Depths: Verify that the new landscape areas elevations, configurations, and dimensions conform to what is shown on Drawing.

Shrub Beds:	18" below finished grade.
Perennial Beds:	12" below finished grade.
Groundcover:	12" below finished grade.
Sod Areas:	6" below finished grade, mixed with existing soil.

If the on site conditions do not match what is shown on the Drawings, Contractor must notify Landscape Architect immediately, and not proceed with installation of soil mix in the effected area. It is also understood that the data in the Drawings are not intended as representations or warranties of exact conditions that may be encountered at the time of construction. It is expressly understood that the Owner and Landscape Architect will not be responsible for interpretations or conclusions drawn there from by the Contractor. The Contractor shall examine the construction site, coordinate his work with other trades and/or the General Contractor, and determine, to his satisfaction, the conditions on the entire job site.

C. Protection of the Drainage Courses: Provide for the protection of and prevent damage to drainage courses including soil separator fabric, insulation board, and drainage pipe during all operations.

D. Protection of Adjacent Property and Dust Control: Prevent any substances from blowing, spilling, dropping, or depositing on adjacent property. Keep the construction area sufficiently dampened to control dust caused by operations.

E. Utilities: Prevent any damage to any permanent or temporary installation of public or private utilities found anywhere on or around the job site. If the contractor is responsible for damage to any utility structure of line as described herein, the Contractor shall repair or cause to have repaired all damage to the Landscape Architect's and Owner's satisfaction.

F. Soil Slope Maximum: Slope soil and grade to meet finish elevations as shown on Drawings and specified herein.

G. Review of Site: Thoroughly review the site to determine if all grading and soil preparation has been satisfactorily achieved. Report unsatisfactory conditions to the Landscape Architect and make repairs prior to start of work.

H. Water Source: Provide all required temporary water supply from source(s) provided by Owner. See Drawings for permanent locations of water sources such as hose bibs.

I. Protection of the Work: Protect the entire project area against traffic, damage, erosion or other use by means accepted by the Landscape

TADI

VA 578-12-090

1 8 A P R 1 2 3 2 9 0 0 0 - 1 0

17MAY12 (AMENDMENT 1)

Architect. The Contractor shall not be responsible for repairing damage caused by Acts of God or acts of vandalism or malicious intent. Any barricades or temporary fencing and signs shall be maintained until acceptance. Upon final acceptance of the work, remove said barricades or temporary fences, or leave them if so desired by the Owner. Damage to existing structures, utilities, trees, lawns, shrubs, pavements or other property caused by the Contractor shall be restored to original conditions at the Contractor's expense.

J. Utilities: Have Utility Owners stake locations prior to excavation of plant pits or beds.

K. Weather: Do not sod during periods of excessive heat.

L. Notices Required: Prior to or immediately following application of lawn care products, post all points of entry a white marker consisting of a 4" x 5" sign attached to a dowel or supporting device, at least 12" above the sod. The marker shall state with application -- Stay off Grass until Dry -- For information, Contact: (Insert your name and business phone number). Follow federal guidelines when applying all horticultural chemicals.

1.7 APPLICABLE PUBLICATIONS

A. The publications listed below, form a part of this specification to the extent referenced. The publications are referenced in the text by basic designation only.

B. American National Standards Institute (ANSI) Publications:

ANSI Z60.1-04Nursery Stock or later editions

ANSI Z133.1-06Tree Care Operations-Pruning, Trimming,
Repairing, Maintaining, and Removing Trees and
Cutting Brush- Safety Requirements

C. Hortus Third, A Concise Dictionary of Plants Cultivated in the U.S. and Canada.

D. American Society for Testing and Materials (ASTM) Publications:

C136-06.....Sieve Analysis of Fine and Coarse Aggregates

C516-02 Vermiculite Loose Fill Thermal Insulation

C549-06 Perlite Loose Fill Insulation

D977-05 Emulsified Asphalt (AASHTO M140)

D2028-97 (Rev. 2004) Cutback Asphalt (Rapid-curing Type)

D2103-05 Polyethylene Film and Sheeting

E. Sodgrass Producers International: Sodgrass Sodding.

PART 2 - PRODUCTS

2.1 GENERAL

A. All plant and sod material will conform to the varieties specified or

TADI

VA 578-12-090

1 8 A P R 1 2 3 2 9 0 0 0 - 1 1

17MAY12 (AMENDMENT 1)

shown in the plant list and be true to botanical name as listed in Hortus Third.

2.2 PLANTS

- A. Plants: Refer to the Plant List, or Drawings, for specific types and quantities of plants to be furnished. Quantities are included for convenience only. In the event that discrepancies occur, the actual plant designations as drawn on the Drawings shall govern.
1. Source: Plants shall be nursery grown in northern Illinois, not field collected, in accordance with good horticultural practices, and root pruned within the last two years.
 2. Plant Hardiness: All plants provided by the Contractor shall be grown under climate conditions similar to those in the locality of the project in Northern Illinois for at least two years.
 3. Quality: All plants shall be true genus, species and variety and have a normal habit of growth. They shall be sound, healthy and vigorous, well branched and densely foliated when in leaf, be free of disease, insect pests, eggs or larvae, and have healthy well developed root systems. They shall be free from physical damage or adverse conditions that would prevent thriving with the specified result. They shall be of specimen quality, exceptionally heavy, symmetrical, tightly knit and so trained or favored in development and appearance as to be unquestionably and outstandingly superior in form, number of branches, compactness and symmetry. Under-grown, overgrown or root bound plants are not acceptable quality. All plants shall show evidence of satisfactory growth prior to Final Acceptance.
 - a. Trees: All trees shall have straight trunks with all old abrasions completely calloused over, free of objectionable disfigurements. Trees which have a damaged or crooked leader, or multiple leaders, unless specifically specified, or trees with abrasions of the bark, sun scalds, or disfiguring knots, are not acceptable quality. Such trees shall be pruned per the direction of the Landscape Architect to achieve this effect.
 - b. Shrubs: Full plants with many branches after planting, as described above. Bare root plants shall have many fine hair-like roots.
 - c. Container Plants: Thoroughly rooted within the grow container, for at least one growing season.
 - d. Perennials and Vines: Vegetatively propagated to insure genus, species and variety.
 - e. Bulbs: Top size bulbs.
 4. Size: Conform to the measurements specified in the Plant List or on the Drawings measured before pruning when their branches are in their

TADI

VA 578-12-090

1 8 A P R 1 2 3 2 9 0 0 0 - 1 2

17MAY12 (AMENDMENT 1)

normal position. Height and spread dimensions specified refer to the main body of the plant and not from root tip to top. Tree caliper measurement shall be taken at a point on the trunk, 6" above natural root zone, for trees up to 4" in diameter, and at a point 12" above the natural root zone for trees over 4" in diameter. Remove all excess soil on root ball prior to measuring or digging. Plants that meet the measurements specified, but do not possess a normal balance between height and spread, are not acceptable quality.

5. Substitutions: Substitutions may be permitted, only if proof is submitted that any plant specified is not obtainable. A proposal will be considered for use of nearest equivalent size of variety with an equitable adjustment of contract price. Such proof shall be submitted in writing and shall be subject to verification by the Landscape Architect.

B. Plants shall be in accordance with ANSI Z60.1, except as shown on the Drawings. Where the Drawings or specifications are in conflict with ANSI Z60.1, the Drawings shall prevail.

C. Planting Fertilizers:

1. Commercial Fertilizers: Complete fertilizer, uniform in composition, free flowing and suitable for application with approved equipment. Type and application rate shall be determined by testing agency's soil test, but may contain the following percentages by weight: 10% nitrogen, 10% phosphorous, and 10% potash.
2. Super Phosphate: A soluble mixture of treated minerals, 20% available phosphoric acid.
3. Bone Meal: Commercial, raw, finely ground; 4% nitrogen and 20% phosphoric acid.

D. Plant Maintenance Materials:

1. Anti-desiccant Spray: An emulsion which provides a protective film over plant surfaces, permeable enough to permit transpiration, such as "Wiltpruf", NCF Nursery Specialty Products, Inc., Groton Falls, N.Y., or equivalent.
2. Insecticides, Herbicides, Fungicides: Materials used for the control of pests shall be appropriate to the pest or pests which pose a problem to the materials, and shall be used by licensed personnel in strict accordance with the manufacturer's recommendations. No phytotoxic materials shall be used. Follow Federal guidelines when applying horticultural chemicals.
3. Tree Paint: Not acceptable.

E. Plant Support Appurtenances:

1. Ground Anchors: 30" stamped steel all-purpose tree stake as manufactured by A.F. Chance Co., Centralia, Mississippi; or Duckbill Earth Anchor, or equivalent. Use three anchors per tree. Bury a

TADI

VA 578-12-090

1 8 A P R 1 2 3 2 9 0 0 0 - 1 3

17MAY12 (AMENDMENT 1)

minimum of 30" in compact soil.

2. Guy Cable: 1/4" galvanized twisted seven strand rope.
3. Guying Wire: 10 gauge annealed galvanized steel double strand.
4. Hose: 8" to 10" lengths of 2-ply, reinforced black rubber hose, at least 3/4" diameter. Use white rubber hose to flag all wires and cables used.
5. Turnbuckles: Galvanized or dip-painted, with 3" minimum lengthwise opening, fitted with screw eyes.
6. Ties: Constructed of No. 10 gauge galvanized wire, single strand through an 8" to 12" length of plastic hose.

2.3 SOD

A. Sod:

1. Variety: Unless otherwise specified on the Drawings, sod shall be Black Beauty Fescue Sod, as supplied by Central Sod Farms, Inc.

www.centralsod.com

2. Quality: The sod used shall be mineral grown grass, native to the locality of work. It shall be either nursery grown or field grown and be well rooted. Sod that has been grown on soil high in organic matter, such as peat sod is not acceptable quality. The consistency of adherent soil shall be such that it shall not break, crumble, or tear during handling and placing of sod. Each piece of sod shall be well covered with sod grass, free from noxious weeds and other objectionable plants, and shall not contain substances injurious to growth. The grass shall be cut to a length of not less than 1-1/2", nor more than 4" before the sod is cut.
3. Size, Thickness and Strength: Individual pieces of sod shall be cut to the supplier's standard width and length. Maximum allowable deviation from standard widths and lengths is 5%. Sod pads shall not be broken, torn or have uneven ends. Sod shall be machine cut at a uniform soil thickness of 3/4", plus or minus 1/4", at the time of cutting. Measurement for thickness shall exclude top growth and thatch. Standard size sections of sod shall be strong enough to support weight and retain size and shape when suspended vertically from a firm grasp on the upper 10% of the section.

B. Sod Maintenance Materials:

1. Weed Killer: A broad-leaf, broad-spectrum herbicide, not a pre-emergent, appropriate to the treatment of the specific pest, applied by licensed personnel per manufacturer's recommendations.
2. Fungicide: A fungicide appropriate to the treatment of the specific fungus identified as a pest, applied by licensed personnel per manufacturer's recommendations.
3. Insecticide: An insecticide appropriate to the treatment of the

TADI

VA 578-12-090

1 8 A P R 1 2 3 2 9 0 0 0 - 1 4

17MAY12 (AMENDMENT 1)

specific insect identified as a pest, applied by licensed personnel per manufacturer's recommendations.

4. Commercial Fertilizers: Complete fertilizer, uniform in composition, free flowing with elements partially derived from organic sources, and suitable for application with approved equipment.

- a. For General Maintenance: Type and application rate shall be determined by testing agency's soil test, but may contain the following percentages by weight: 10% nitrogen, 10% phosphorous, and 10% potash.

2.4 OTHER MATERIALS

- A. Bark Mulch: Clean triple-shredded hardwood bark, not to exceed 2" in its largest dimension, free of foreign matter, sticks, stones and clods.
- B. Washed Drainage Gravel: Water-worked, hard, durable non-limestone gravel, washed free of loam, sand, clay and other foreign substances.
- C. Pea Gravel: 1/2" minimum, 1 1/2" maximum.
- D. Soil Separator: 100% continuous filament polyester non-woven needle-punched landscape filter fabric with a weight of 4.2 oz./yd., 70 mils thick, with needlepoint puncture bonding, such as Ling 125 EX Geotextile, as manufactured by Ling Industrial Fabrics, Inc., or equivalent. Do not use woven, knitted, heat bonded or polyethylene soil separator.
- E. Sand: Clean, sharp, well-graded, coarse sand passing 1/4" mesh screen, free of foreign and organic matter, with a pH of 5.5 to 6.5.
- F. Gravel Mulch: New York Bluestone Chips, clean, dust free and free of foreign matter, sticks, stones and clods, as supplied by Town & Country Landscape Supply Co., 3900 W. 167th St., Markham, IL 60426
- G. Steel Edge: 1/4" x 5" black steel strip, held in place with 15" long steel stakes which are manufactured for the purpose of securing said strip; such as Border Concepts, as supplied by Midwest Trading, Lurvey's American Green, Skokie Valley Material, Wilson Landscape Nursery or Shemin Nurseries.
- H. Labels: Each plant, or group and bundles or containers of the same species, variety, and size of plant, shall be legibly tagged with a durable, waterproof and weather-resistant label indicating the correct plant name and size specified in the plant list. Labels shall be securely attached and not be removed.

2.5 TOPSOIL AND SOIL MIX MATERIALS

- A. Landscape Soil Mix #1: A mix three parts topsoil and one part coarse sand as specified hereunder, for general use in all sodded areas.
 1. Topsoil: A sandy loam, fertile, friable natural topsoil typical of the locality and without mixture of subsoil, having a pH of 6.3 to 6.8. and organic matter at 3.5% minimum. Clay soils shall not be acceptable. Soil shall be free of lumps, stones, debris and noxious weeds. Soil mix shall be adjusted with soil amendments to adjust pH

TADI

VA 578-12-090

1 8 A P R 1 2 3 2 9 0 0 0 - 1 5

17MAY12 (AMENDMENT 1)

(quantity determined by soil test and thoroughly mixed by hand or mechanical means, at a predetermined on site location prior to placement. Contractor shall coordinate exact location with General Contractor.

2. Sand: Clean, sharp, well-graded, coarse sand passing 1/4" mesh screen, free of foreign and organic matter, with a pH of 6.5 to 7.0.
- B. Landscape Soil Mix #2: For all shrub, trees, perennials, and ground cover, planting areas use a mix of three parts topsoil and one part coarse sand as specified herein above, and one part horticultural grade pine bark, as specified hereunder.
 1. Pine Bark: Horticultural grade, finely shredded southern pine bark fines with particle size varying between 3/8" to 3/4" with cambium and wood fiber removed.
- C. pH Adjustments: Adjustments to soil pH shall be pursuant to soil test recommendations to achieve a slightly acid soil, with a pH of 6.5 to 7.0.
 1. Limestone: Ground limestone (calcium carbonate) if required, shall have the following analysis: At least 50% shall pass a No. 200 USS mesh sieve. At least 90% shall pass a No. 100 USS mesh sieve. 100% shall pass a No. 10 USS mesh sieve. Total carbonates shall not be less than 80% or 44.8% calcium oxide equivalent; for purposes of calculation total carbonates shall be considered as calcium carbonates. Do not incorporate limestone into soil mix without acceptance of Landscape Architect.
 2. Sulphur: Sulphur shall be granular sulphur as specified by the Landscape Architect, according to the soil test recommendations and to the types of plantings in the area requiring amendments.
- D. Organic Matter: If organic matter is less than required minimum, amend to minimum requirements with pine bark, prior to creating soil mixes.
- E. Obtain material from stockpiles, if any is available, established under Section 31 20 00, EARTH MOVING, subparagraph, Stripping Topsoil, that meets the general requirements as stated above. Amend topsoil for use in soil mixes which do not meet the pH range specified by the addition of pH Adjusters.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Protection of Facilities: Protect all existing or new surfaces, conduit, plumbing lines, waterproofing, insulation board, gravel drainage layers, soil separator, and any other structures in or around the project that are effected by the work of the Contractor. If the Contractor is responsible for any damage to these or any other items he will repair or arrange for repair to the satisfaction of the Landscape Architect and Owner.

TADI

VA 578-12-090

1 8 A P R 1 2 3 2 9 0 0 0 - 1 6

17MAY12 (AMENDMENT 1)

- B. Preparation of Planting Areas for Soil Mix Placement: Clear top of drainage course layer and bottoms of planters of all trash and debris before placement of soil mix. Remove and dispose of all debris off site.
- C. Planting - General: Prior to planting, clear surface of trash, debris and stones larger than 1-1/2" in diameter, and all roots, brush, wire, grade stakes and other objects which would interfere with planting and maintenance operations.
- D. Planting - Maintain Grades: Verify grades established during final soil preparation as being true to finish contours shown, and maintain such areas until the effective date to begin planting. Level any undulations or irregularities in the surface resulting from soil amendment operations prior to planting.
- E. Planting Season: Planting shall be done only within the following dates. Special conditions exist which may warrant a variance in the planting dates. Submit a written request for such variance to the Landscape Architect. "Workable ground" is defined as site soil conditions which are neither frozen nor muddy.
1. Deciduous Trees and Shrubs: Workable ground to June 15th and September 1st to October 15th, except as noted on plans. Ground cover can be planted no later than October 1st.
 2. Evergreen Trees and Shrubs: Spring only - workable ground to June 15th. Trees shall be planted only while in a dormant state, unless otherwise directed by the Landscape Architect. The determination as to when the ground can be worked shall be made by the Landscape Architect, and such determination shall be conclusive of this question.
 3. Evergreen Groundcovers: Spring only - workable ground to May 15th. Plant evergreen groundcovers only while in a dormant state, unless otherwise accepted by Landscape Architect.
 4. Spring Only Materials: Plant oaks, maples, dogwoods, and other designated Spring-Only plants only in the spring - workable ground to May 15 - and only in a dormant state unless otherwise accepted by Landscape Architect. See Drawings.
 5. Perennials: Plant perennials from late spring to early fall. If construction delays prevent early fall planting, perennials shall be planted the following spring.
- F. Pre-planting Operations:
1. Layout: Mark on ground and stake locations for trees, shrubs, and outlines of areas to be planted before any excavation is made. All locations shall be reviewed by the Landscape Architect before excavating pits, making necessary adjustments. Trees and shrubs not dimensioned as to precise locations on the Drawings shall be scaled from the Drawings and the plant placed in the appropriate relationship indicated. All drained trees shall be located to insure

TADI

VA 578-12-090

1 8 A P R 1 2

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17MAY12 (AMENDMENT 1)

positive drainage, minimum 1% slope, to pipe stubs. Notify Landscape Architect prior to planting if discrepancy exists.

2. Excavation of Pits and Beds: Refer to Section 02920.
 3. Tree Pit Preparation: Confirm tree pits are located as shown on the Drawings, circular or rectangular in outline as shown, allowing specified space between tree pit edge and root ball, with root ball centrally placed in pit. Soil mix shall fill this area in between the root ball and tree pit. The tree pit shall be formed and prepared as shown on the Drawings.
 4. Plant Bed and Pit Preparation: Confirm plant pits or beds as shown on the Drawings, allowing enough depth to accommodate a depth of roots set on +2" or +4" settling beds as detailed on the Drawings.
 5. Test Drainage: Test drainage of pits by filling with water. Conditions permitting the retention of water in pits for more than 24 hours shall be brought to the attention of the Landscape Architect before planting is done. The Contractor shall be responsible for providing adequate drainage. State conditions and submit proposal for correcting condition.
- G. Sod - General: Prior to installation, clear surface of all stones larger than 1-1/2" in diameter, and all trash, debris, roots, brush, wire, grade stakes and other objects that would interfere with planting or maintenance operations. Keep prepared soil in friable condition by cultivation until work in this section is installed.
- H. Sod - Verification of Grades: Verify grades established during final soil preparation as being true to finish contours shown, and maintain such areas until the effective date to begin installation. Level any undulations or irregularities in the surface resulting from fertilizing, liming, tilling, or other causes. Reconstruct flooded, washed out areas or areas damaged otherwise and reestablished grades in accordance with the Contract Documents. Keep grade down at adjacent paving areas so as to not expose edge of sod pad. Grade small slope away from buildings and walkways.
- I. Sod - Treated Soil: Do not place sod on soil which has been treated with soil sterilizers until sufficient time has elapsed to permit dissipation of toxic materials. The Contractor shall assume full responsibility for any loss or damage to sod arising from improper use of sterilizers or due to his failure to allow sufficient time to permit dissipation of toxic materials, whether or not such sterilizers are herein specified.
- J. Sod Season: The spring season for sodding lawns shall be from workable ground conditions and sod can be cut, from approximately April 1 through June 30; and from August 15 to November 21. Sod may be installed throughout the planting season except on days of +85 degrees and providing sufficient moisture is added to prevent drying out. "Workable" ground condition is defined as ground conditions which are

TADI

VA 578-12-090

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17MAY12 (AMENDMENT 1)

neither frozen nor muddy. Sod shall not be placed when the sod or ground surface is frozen or during extended drought. Special conditions exist which may warrant a variance in the sodding dates. Submit a written request for such variance to Architect.

- K. Sod - Moistening the Soil: During periods of high temperatures and after all unevenness in the soil surface has been corrected, the soil shall be lightly irrigated immediately prior to laying the sod.

3.2 INSTALLATION:

- A. Mix Topsoil and Sand: Prior to mixing, confirm soil mix and amendments with, Landscape Architect. Provide and mix approved topsoil, coarse sand, and amendments as described herein, in an off site location, Do not mix frozen, muddy or unworkable soil, sand or amendments.
- B. Verification of Depths of Planting Areas: Contractor shall verify that the elevations, configurations, and dimensions of the landscaped areas match those shown on the Landscape Architectural Drawings. If the on site conditions do not match what is shown on the Drawings, the Contractor must notify the Landscape Architect immediately and do not install soil mix in the effected area.
- C. Tillage: Thoroughly till the soil to a depth of at least 100 mm (4 inches) by scarifying, disking, harrowing, or other approved methods. This is particularly important in areas where heavy equipment has been used, and especially under wet soil conditions. Remove all debris and stones larger than 25 mm (one inch) remaining on the surface after tillage in preparation for finish grading. To minimize erosion, do not till areas of 3:1 slope ratio or greater. Scarify these areas to a 50 mm (one inch) depth and remove debris and stones.
- D. Spread Soil Mix: After tilling the soil for bonding of soil mix with the subsoil, spread the soil mix evenly to a minimum depth of 6 inches for lawn mixed with existing soils, 12 inches for perennial beds, 18 inches for shrubs beds, and to the bottom of the tree rootball for all trees. Incorporate soil mix at least 50 to 75 mm (2 to 3 inches) into the subsoil to avoid soil layering. Do not spread soil when frozen or excessively wet or dry.
- E. Install Soil: See Drawings (including civil) for finish grades of all soil areas. See Job Conditions for information regarding the protection of facilities. Provide enough soil mix so that finish grades and elevation will be met after settlement. Soil depth shall be a minimum of 12" inches for all sod and perennials areas, 18" for all shrub areas, and to the bottom of the tree root ball for all trees.
- F. Finish Grading: Rake smooth and finish grade all planted areas. Crown of berms shall be raked smooth so that they form a convex curve, not a point. Correct irregularities in finished surfaces to eliminate depressions. Any undulations or irregularities on the surface shall be raked to smooth planes prior to planting. All areas shall slope to drain

TADI

VA 578-12-090

1 8 A P R 1 2 3 2 9 0 0 0 - 1 9

17MAY12 (AMENDMENT 1)

as indicated on Drawings. Elevations in landscape areas after planting shall be +/- .10 foot of the finished grades shown on the drawings. Contractor shall refer to Drawings (including civil) for all grading contours and elevations. Contractor may be required by Landscape Architect to verify elevations of final grades by field surveys, and staking.

- G. Final Grades: Final finish grades of all planting areas after settling, shall be as shown on the Drawings (including civil), unless indicated otherwise. Required final grades and elevations shall be as shown by figured elevations or dimensioned depths; or where none are indicated, final grades and elevations shall be even lines or planes between such figured elevations, or between figured elevations and tops of paving or curbs. Verify grades established during final grading as being true to finish contours shown, and maintain such areas until the effective date to begin any operations. Protect finished areas from damage by vehicular or pedestrian traffic. Complete sod work only after areas are brought to finished grade.

H. Planting:

1. Setting and Planting: Set trees and shrubs in center of pits on layer of soil mix, plumb and straight and at such level that, after settlement, the crown of the tree root balls shall be 2" above the adjacent finished grade, and shrub root balls shall be at finish grade. Do not backfill beds with planting soil until they have been reviewed by the Landscape Architect. Brace plants rigidly in position until the planting soil has been tamped solidly around the ball and roots. Tamp thoroughly before installing remainder of the planting soil to the top of pit, eliminating all air pockets. Never plant groundcover or other plants over top of root ball of tree or other plant.
 - a. Trees in Tree Pits: Place trees centrally in pits so that all tree trunks are straight and plumb. When shown in-line, plant trees so that they are in alignment when viewed from end of row.
 - b. Balled and Burlapped Plants: For balled and burlapped plants, leave low profile baskets, burlap wrapping and ropes intact around balls. Remove any burlap or twine remaining at end of guarantee period.
 - c. Container Plants: Set container grown stock as specified for balled and burlapped work. Plant groundcover and perennial plants, triangularly spaced unless otherwise shown on the Drawings.
2. Watering: Thoroughly water all plantings immediately after planting using the injection water method with a "Ross Root-Feeder". Groundcover and perennial beds may be sprinkled directly with a hose that has a water dispersing attachment, taking care not to wash soil away from roots. Gator bags shall be provided for each tree and shall be kept filled during periods of drought.

TADI

VA 578-12-090

1 8 A P R 1 2 3 2 9 0 0 0 - 2 0

17MAY12(AMENDMENT 1)

3. Relationship to Grade: After planting and settlement, trees shall be 2" above adjacent finished grade. Where soil mix exceeds 4" in depth between drainage course and bottom of root ball, install high enough to achieve this relationship after settlement. All other plants shall bear the same relationship to finish grade after planting and settlement as they did in the nursery.
4. Mulching: Mulch all plantings immediately after planting, as planting progresses. Mulch all planting beds with a 2" layer of specified wood mulch. Mulch perennial and groundcover to a depth of 2 inches. Mulch all planting beds in their entirety, including trees in all beds to cover a concentric circular or rectangular area equivalent to the size of the tree or plant pit. Mulch all plant beds, including beds for shrubs, groundcovers and perennials in their entirety. When mulching groundcover beds, do not bury leafy stems or vines under mulch material. Volcano mulching is never permitted.
5. Install tree irrigation bags immediately after planting by zipping together around base of tree trunk. Fill bags with water immediately upon installation. Re-fill bags on a weekly basis during initial maintenance. Remove bags November 15.

I. Post-Planting Operations:

1. Anti-Desiccant Spray: If deciduous trees or shrubs are accepted by Landscape Architect to be moved full leaf, spray with anti-desiccant at nursery before moving and again 2 weeks after planting. Apply anti-desiccant using power spray to provide an adequate film over trunks, branches, stems, twigs and foliage, immediately after planting.
2. Pruning: Prune, thin out and shape trees and plants in accordance with standard horticultural practice, under the direct observation of the Landscape Architect, to preserve the natural character of the plant and to compensate the loss of roots during transplantation. Do not prune before delivery or planting of plants. Perform pruning with clean, sharp tools. Required height and spread sizes are after pruning except as accepted by the Landscape Architect.
3. Guying: No initial guying is required. However, if during the initial maintenance or warranty period, any plant fails to maintain a straight and plumb position, furnish specified supports and install per Drawings at no additional cost to the Owner. Perform guying and staking only after review and consultation with the Landscape Architect.
 - a. Guying: Guy per details all specimen trees of 4" in caliper or more. Guy wires shall run out from tree in 3 opposed directions and each guy wire shall have a white "flag" as a warning of existing obstruction. Tighten guy wires to firm tensions by approved methods.
4. Other Supports: Securely install all other planting support systems, such as for perennials or vines, as detailed on the Drawings. H.

TADI

VA 578-12-090

1 8 A P R 1 2 3 2 9 0 0 0 - 2 1

17MAY12 (AMENDMENT 1)

J. Sodding:

1. Laying the Sod: Lay sod so that no voids occur, tamp and roll, and then thoroughly water. The completed sodded surface shall be true to finished grade, even and firm at all points. Lay the first row of sod in a straight line with subsequent rows placed parallel to and tightly against each other. Stagger lateral joints to promote more uniform growth and strength. Do not overlap or stretch sod. Butt tight all joints in order to prevent voids at exposed pad bottoms which would cause air drying of the roots.
 - a. Slopes: Place sod in ditches with the longer dimension perpendicular to the flow of water in the ditch. Place sod on slopes, starting at the bottom of the slope, with the longer dimension parallel to the contours of the ground. Bury the exposed edge flush with the adjacent sod.
2. Watering and Rolling: Water sod immediately after installation to prevent excessive drying during the progress of the work. As sodding is completed in any one section the entire area shall be rolled. Thoroughly irrigate to a depth sufficient so the underside of the new sod pad and the soil immediately below the sod are thoroughly wet. Keep watering sufficiently up until 3rd cutting.
3. Edges: Where sod abuts hard edging, such as sidewalks, curbs, steel or wood edges, butt sod tightly to edge, leaving no gaps. Where sod abuts a soft edge, such as at plant beds or tree pits, trim the sod to form neat lines accurately placed according to the Drawings. Where sod edge is shown as parallel or perpendicular, construct edge straight and true to line to within one inch tolerance. Where sod edge is shown as curvilinear, blend edge to create a smooth line with no bumps.

3.3 INSTALL DECORATIVE GRAVEL MULCH AND EDGING

- A. Installing Steel Edge: Anchor edge with stakes spaced not more than 3'-0" on center, driven at least 1" below top elevations of the edging. Multiple stake and clinch to avoid any variance of line at connections. Top of edging shall be no more than 1" above finish lawn and planter grades. Where steel edge is used against paving, edging shall be flush to paving or no more than 1" below paved surface and in no instance extend above the finish surface elevation of the paving. Use a string line for straight alignments. Alignment and grade of all edging shall be subject to the Landscape Architect's review. Correct defective work prior to review.
- B. Installing Gravel Mulch: Prepare compacted subgrade to 3" below finished grade. Install specified polyethylene film over subgrade as shown on Drawings, except in the area immediately surrounding each tree (at least 2'-6" on all sides of trunk). Install in a continuous length wherever possible. If sectioning is required, overlap sections by 12" (minimum). Install gravel to full 3" coarse thickness in one operation.

TADI

VA 578-12-090

1 8 A P R 1 2

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17MAY12 (AMENDMENT 1)

Hand place as necessary to achieve a neat appearance. The finished surface shall be reasonably stable, free of mounds, dips or windows.

3.4 PROTECTION, REPAIR AND CLEANING

- A. Disposal of Materials: All unclassified excavated cut material and any fill material in excess of required volumes, including excess topsoil, supplemental topsoil, and soil mix materials, shall be removed and legally disposed of off the site with consent of Owner. Dispose of surplus and waste materials off the site resulting from planting and sodding operations daily and as the work progresses.
 - B. Protection: Protect plants against damage, including erosion and trespass, and provide proper safeguards as needed. Replant damaged areas. Repair or replace all such defective work, and all other work damaged thereby, which becomes defective until substantial completion. Advise Landscape Architect at that time as to whether continuing protections are required, and leave in place, if acceptable.
 - C. Repair: Maintain grades and slopes until plantings are established. Repair and re-establish grades in settled areas. Repair any washouts, eroded areas or areas damaged otherwise immediately to requirements as specified.
 - D. Clean-Up: Remove and properly dispose of any resultant soil and debris. Sidewalks and other paved areas shall be kept clean. Upon completion of work, promptly remove all equipment and unused materials provided for work, and put the premises in a neat and clean condition.
 - E. Review: Review required grades with Landscape Architect prior to planting operations, and again after planting operations.
 - F. Repair of Grade Relationship: Plants that do not bear the correct relationship to finished grade after settlement shall be raised or lowered, regardless of size, at no additional cost to Owner, throughout the specified warranty period.
 - G. Plant Replacements: Replace, without cost to the Owner, and as soon as weather conditions permit and within a specified planting period, all dead plants and those which are not in a vigorous, thriving condition during and at the end of the warranty period. "Vigorous, thriving condition" is defined as a live, symmetrical plant which is free of dead or dying branches and branch tips, and which bears foliage of normal density, size, and color. Through the specified period, assume full responsibility for failure to maintain in good condition all landscape plantings. Remove and replace excessively pruned or mis-formed stock resulting from improper pruning. Replacements shall closely match adjacent specimens of the same species. They shall be furnished, planted, mulched, wrapped, staked or guyed, watered, basined, maintained and warranted as specified, and shall be subject to all requirements stated in the Contract Documents. Make all necessary repairs due to plant replacements at no extra cost to the Owner.
1. Pre-Tagged Materials: Pre-tagged materials are subject to the same

TADI

VA 578-12-090

1 8 A P R 1 2 3 2 9 0 0 0 - 2 3

17MAY12 (AMENDMENT 1)

conditions specified above. All costs, including purchase of materials and shipping, shall be born by the contractor.

- H. Work Damaged by Others: In the circumstance whereby the Owner requests repair of planting areas which have been damaged by others, repair said areas designated by the Landscape Architect upon issuance of a written change order which specifies the cost to the Owner. Replanting shall cause a minimum of disturbance to the existing plantings. This work shall be installed, maintained and warranted according to the same conditions as specified herein.
- I. Protection of Installed Sod: Protect sod against damage, including erosion and trespass, and provide proper safeguards as needed. Replant damaged areas. Repair or replace all such defective work and all other work damaged thereby, which becomes defective during the term of the specified warranty.
- J. Sod Replacements: Replace, without cost to the Owner, as soon as weather conditions permit and within a specified sodding or seeding period, all areas not in a vigorous, thriving condition, during and at the end of the warranty period. "Vigorous and thriving condition" is defined as sod which bears foliage of a normal density, size and color. Replacements shall closely match adjacent specimens of sod. They shall be furnished, planted, maintained and warranted as specified, and shall be subject to all requirements stated in this Specification. Make all necessary repairs due to replacements at no extra cost to the Owner.
- K. Disposal of Surplus Material: Surplus and waste materials resulting from operations shall be disposed of by the Contractor daily as the work progresses.
- L. Completion Cleaning: Furnish all labor and materials to perform daily cleaning operations as the work progresses and at the conclusion of work. During the progress of the work, remove and properly dispose off site any resultant dirt and debris. Keep sidewalks and other paved areas clean of debris. Upon completion of the work, remove all equipment and unused materials provided for work, and put the premises in a neat and clean condition.
- M. Tree Seal Removal: Remove trees seals just prior to end of warranty period.
- N. Patching: In the circumstance whereby the Owner requests repair of an area which has been accepted and then damaged by others, the Contractor shall repair said areas designated by the Landscape Architect, upon issuance of a written change order which specifies the cost to the Owner. Sod repair shall be accomplished in a manner which shall cause a minimum of disturbance to the existing stand of grass. This work shall be installed, maintained and warranted according to the same conditions as specified herein.

3.5 MAINTENANCE

- A. Maintenance Periods: Perform landscape maintenance, as specified

TADI

VA 578-12-090

1 8 A P R 1 2 3 2 9 0 0 0 - 2 4

17MAY12 (AMENDMENT 1)

hereunder, for the following periods:

1. Initial Maintenance: The Contractor is responsible for maintenance of each area until it has been accepted by the Landscape Architect and the warranty period is formally started. Begin maintenance immediately upon delivery to the site and as each plant and each portion is planted and sodded, and continue until the start of the warranty. All maintenance work shall be coordinated with Owner's representative. The Owner will re-inspect all plants and sod at the end of the One Year Warranty.
 2. First Year Maintenance Bid: Perform landscape maintenance for a one year period, commencing with substantial completion and ending with Final Acceptance of the project by the Owner.
 3. Definition of Annual: The term "annual" is used herein for the convenience of describing operations which take place yearly by the maintaining Contractor, and does not imply any performance obligation beyond the specified maintenance periods.
- B. Work Subject to Maintenance: The work installed under this Contract for the entire project site area.
- C. Maintenance of Plant Materials: Maintain all plantings in a healthy flourishing condition. Maintenance of new planting consists of pruning, watering, cultivating, replanting, weeding, mulching, tightening and repairing of guys, repair of wrapping, cleaning, edging, and furnishing and applying sprays as are necessary to keep the plants free of insects and disease. First Year Maintenance also includes "annual" soil tests, pH adjustments, fertilizations, "annual" pruning and two clean-ups per season specified.
1. Objectives: The objectives of the landscape maintenance program are to present a landscape that preserves in manner and proportion the effect intended by the Landscape Architect. Utilize the best horticultural practices of the trade, the best methods, materials and equipment. Perform all tests necessary to maintain plants in a healthy, flourishing, condition. The Contractor shall be so familiar with all elements of the landscape in his care that if a problem arises, the problem is resolved by the Contractor before it progresses beyond control.
 2. Landscape Maintenance Season: The landscape maintenance season is defined as the months during which landscape maintenance operations are required, and extends from April 1 to November 30 of any given year. When substantial completion occurs after April 1, the season extends from substantial completion through November 30.
 3. Watering: Provide all necessary watering to insure the success of all plantings by supplying a sufficient quantity of water to penetrate the root systems of the plants on a frequent enough basis so as to avoid any moisture related stress. Monitor the application

TADI

VA 578-12-090

1 8 A P R 1 2 3 2 9 0 0 0 - 2 5

17MAY12 (AMENDMENT 1)

of water to prevent any too-dry or too-wet condition from occurring. Immediately bring any excessive moisture condition to the attention of the Landscape Architect. Regardless of watering method, it is the responsibility of the Contractor to monitor the application of water and to correct and adjust its application to insure success of the plantings.

- a. Confirm Water Source: See Job Conditions Section of this specification.
 - b. Pits and Beds: Auger test root balls of trees and plants on a weekly basis to assure consistent and adequate moisture content for their survival. Shrubs may be routinely watered with soakers, provided that the Contractor thoroughly saturates the root zones. Otherwise, he shall use a "Ross Root Feeder". Hand sprinkling of the shrubs is not acceptable. Use a "Ross Root Feeder" for trees to assure adequate saturation of the root balls.
 - c. Other Plantings: Groundcovers and perennial beds may be watered with a hose that has a water dispersing attachment, provided that the beds are adequately and frequently watered to assure the success of those plantings.
4. Tree Pit and Plant Bed Maintenance: Maintain a circular outline at the base of all trees where practical and possible until the trees have become established. Cultivate all shrubs, evergreens, shrub beds, ground cover beds and other planting beds as required to keep areas free of weeds and grass. Keep tree pits free of weeds. On a weekly basis, clean all planted areas of litter including cigarette butts and paper items.
5. Pruning: Landscape Architect will review all plantings with Contractor at the maintenance review to determine the need for pruning. Special reviews shall be made by the Contractor after severe storms to determine damage. Remove all rubbing, dead, broken or down limbs immediately. Prune to preserve growth lines of shrubs, evergreens and trees to conform with the objectives of the landscape design. Do not shear or tip-prune any plants without first consulting with the Landscape Architect. Use clean implements, disinfecting between each cut, if necessary. Remove all debris resulting from pruning operations and legally dispose of off the site as the work progresses, at least daily.
- a. Trees: Prune trees to retain required height and spread. Do not cut tree leaders. Remove all dead wood, suckers and broken or badly bruised branches; remove only injured or dead branches from flowering trees, if any. Malus and Prunus shall have only broken, dead or rubbing branches removed. At Contractor's own discretion, he may paint cuts over 1/2" in size with specified tree paint, covering exposed tissue. Keep tree paint away from adjacent bark. After pruning is completed, and before wrapping, inspect tree

TADI

VA 578-12-090

1 8 A P R 1 2

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17MAY12 (AMENDMENT 1)

- trunks for injury, improper pruning and insect infestation and take corrective measures required. If needed, apply specified insecticide according to manufacturer's instructions, and in accordance with local and state laws.
- b. Shrubs: Prune shrubs to retain natural character and accomplish their use in the landscape design. Remove all dead wood, suckers and all broken or badly bruised branches. Formal, Pom-Pom or shearing of plantings is not acceptable pruning.
 - c. Perennials: Remove perennial flower scapes after bloom at each watering, or at least once a week minimum.
6. Annual Pruning: Commence annual pruning operations with the start of the First Year Maintenance Period. Contact Owner to review on-site aesthetic considerations and techniques prior to performing annual pruning maintenance. Light annual pruning shall be required on all trees and shrubs. Prune groundcover beds annually in late spring as required for keeping a neat and trim appearance, to remove winter-burn, to prevent a buildup of thatch and to have a clean edge at pavements.
7. Annual Soil Tests for Plant Beds: Commence annual soil tests with the start of the First Year Maintenance Period and resubmit thereafter at the start of each maintenance period, in early spring. Submit soil test data from four locations on the project site to be designated by the Landscape Architect or Owner. Annual soil tests include a chemical analysis which includes pH, N, P and K, other essential nutrients, and soluble salts, and provide recommendations for fertilizations and pH adjustment for Landscape Architect's or Owner's review.
8. Plant Fertilization and pH Adjustment of Plant Beds: Perform annual fertilizations and pH adjustments according to the recommendations of the testing agency after review of soil test data by Landscape Architect or Owner. Type and application rates of fertilizer and pH adjuster are dependent on results of tests.
- a. Deciduous Trees and Shrubs: Fertilize once between March 15 and April 15 each period, commencing with the start of the First Year Maintenance Period.
 - b. Evergreen Trees, Shrubs, and Groundcovers: Fertilize once between March 15 and April 15 each period.
 - c. Perennials and Annual Flowers: Fertilize once a month during season with low nitrogen fertilizer.
- D. Sod Maintenance: Maintain all sod areas by watering, weeding, replanting, mowing, trimming, edging, and other operations necessary to keep lawn areas green and uniform in appearance. All maintenance which is termed "annual" means those operations which take place yearly by the maintaining Contractor as specified under "Maintenance Period" herein.

TADI

VA 578-12-090

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17MAY12 (AMENDMENT 1)

1. Annual Soil Tests: Sod soil shall be tested once a year at the beginning of the season in several locations for pH and essential nutrients. Submit test results and lab recommendations to the Owner. Appropriate tests to determine fertilization needs of sod areas.
2. Watering Sod: The Contractor shall provide all necessary watering to insure the success of all lawn areas. During the first week, keep sod pad areas moist at all times. In the absence of adequate rainfall, perform watering daily or as often as necessary during the first week, and thereafter for another week in sufficient quantities to maintain moist soil to a depth of at least 4". In subsequent weeks, water sod areas as required to maintain adequate moisture in the upper inches of the soil necessary for the promotion of deep root growth. Water the sod areas prior to the heat of the day to prevent wilting. Watering is required prior to acceptance of the work. Water the areas at the rate necessary to keep installed sod in thriving condition, as defined hereinabove.
 - a. Monitor Moisture: Monitor the application of water to prevent an too-dry or too-wet condition from occurring. Report immediately any excessive moisture condition to the Architect. Contractor shall be so familiar with the state of sod area moisture that he shall notify Architect immediately if sod is endangered.
2. Sod Mowing: The first mowing shall not be attempted until the sod is firmly rooted and secure in place. Perform all mowing in a neat and orderly manner. Remove no more than 1/3 of the grass leaf. Grass height shall be maintained between 1-1/2" - 2-1/2" unless otherwise specified, with frequency of cuttings to be determined by growth rate of sod. Keep mowers sharp and in good adjustment. Cut sod cleanly and sharply, mow evenly so that no ridges are evident. All clippings shall be caught and removed from the site.
3. Edging and Trimming: All sod areas adjacent to paving or cultivated areas shall be kept neat and attractive by edging and trimming. Under no circumstances shall the Contractor trim at the base of trees with a "weed-eater" type of trimmer.
6. Weed Control in Sodded Areas: Keep sod areas free from weeds. If weeds or other undesirable vegetation threaten to smother the planted sod or seed, spray or drench said vegetation with weed killer, or in the case of rank growth, uproot manually, rake and remove from the site. If weed killer is used, apply per manufacturer's recommendations. Sprinkling shall not resume for a 24 hour period following application, or as manufacturer recommends. Contractor shall notify the Owner and Landscape Architect of his intent to use weed killer. Follow Federal guidelines for the application of horticultural chemicals.
7. Annual Sod Fertilization: Apply to all sod areas per soil test

TADI

VA 578-12-090

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17MAY12 (AMENDMENT 1)

recommendations, in mid-spring after early flush of growth and again during late summer or early fall. Sod fertilizer application shall be limited to the outside of tree root zones.

8. Annual pH Adjustment for Sodded Areas: Apply to all sodded and seeded areas per soil test recommendations, in multiple applications if necessary. Do not exceed 5 pounds per 1,000 square feet sulphur per application.
9. Lawn Aeration: The Contractor shall aerate all lawn areas once in the spring and once in the fall with core aerator. Cores shall be disposed of legally, offsite. The Contractor shall have equipment capable of aerating both large and small areas of lawn.
- E. Pest Control: Perform all pest control operations to maintain all trees, shrubs, and plant beds in a flourishing condition, including control of insects, fungus and other diseases. Control pests such as insects or fungus diseases to keep sod and seed areas in a thriving condition. Do not use phytotoxic materials on plants. Use appropriate spray applied by licensed personnel per manufacturer's recommendations. Notify Owner of intent to spray prior to performing this work. Follow Federal guidelines for the application of horticultural chemicals.
- F. Control of Damage: Keep all drain inlets in plant beds clean and draining freely, and make frequent inspections to assure proper drainage.
- G. Weed Control in Tree Pits and Beds: Perform weed control in all planted, mulched or gravel areas by pulling or cultivation. Spraying or drenching may be allowed only if accepted by Landscape Architect and when susceptible vegetation is protected.
- H. Other Maintenance Operations: Clean, rake and maintain all mulch areas at specified depths throughout the maintenance period. Monitor growth and adjust supports for trees, vines and perennials. Sweep or rake up and re-deposit gravel mulches, such as at tree grates or drip strips, which has spilled off of the gravel areas.
- I. Clean-Up: Cleaning operations shall be performed at least daily during and after all maintenance operations, so that the project site is kept in a neat and tidy condition at all times. Clean up after all maintenance operations by removing and legally disposing of any resultant dirt and debris. Keep the sidewalks and other paving clean of material resulting from maintenance work. The Owner will provide general maintenance of sidewalks. Put site in a neat and clean condition after all operations, including removal of pruned vegetation and all other resultant refuse.
- J. Annual Seasonal Clean-ups: Furnish necessary labor and equipment to perform a general clean up of the project area, commencing with the First Year Maintenance Period.
 1. Early April Clean-up: Clean perennials and vines of all dead stalks

TADI

VA 578-12-090

1 8 A P R 1 2 3 2 9 0 0 0 - 2 9

17MAY12 (AMENDMENT 1)

and leaves. Rake beds, sodded and seeded areas. Remove and legally dispose of accumulated debris, dead leaves, twigs and other materials. Remove burlap wrap from trees after first wintering, and each spring thereafter.

2. Early November Clean-up and Mulching: Rake beds, sodded and seeded areas. Remove and legally dispose of accumulated debris, dead leaves, twigs and other materials. Mulch all of the plant beds and tree pits after clean-up, to protect plants during winter months. Re-wrap frost-crack susceptible trees (such as Bradford Pear, Norway Maple or London Plane) with specified burlap wrap.

3.6 ENVIRONMENTAL PROTECTION

- A. All work and Contractor operations shall comply with the requirements of Section 01 57 19, TEMPORARY ENVIRONMENTAL CONTROLS.

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VA 578-12-090

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