Landscaping

Part 1 – GENERAL

1.1 DESCRIPTION

A. Work Included: Landscape installation required for this work is indicated on the Drawings and, in general, includes all planting and other groundcover installation throughout the Work.

B. Review the General Contract Conditions and Division 1, General Requirements, which contain information and requirements that apply to this section.

1.2 QUALITY ASSURANCE

A. Qualifications of workmen:

1. Provide at least one person/foreman who shall be present at all times during execution of this portion of the Work and who shall be thoroughly familiar with the type of materials, design methods, details, etc. being installed and the best methods for their installation and who shall direct all work performed under this Section.

2. This designated person/foreman shall be present at all landscape pertinent pre-construction meetings, scope review meetings, Owner Architect Contractor (OAC) meetings, and on-site throughout the duration of the landscape portion of the project. This designated individual is the main point of contact between all parties involved as it relates to his/her construction procedure.

3. This designated person/foreman shall also be the main point of contact for all submittals, samples and project notifications as outlined herein.

4. This designated person/foreman shall be familiar with all Drawings and Specifications included in the Contract Documents to ensure continuity for the project, and provide clear direction for all consultants involved.

B. Experience Requirement:

1. The person/foreman outlined above must meet the following requirements for approval as the main point of contact for the project:

   a. Minimum of 5 years of successful and continuous experience on projects of this type.
   b. Minimum of 5 successful project types of this size and scope including cost
   c. Contractor to provide proof of the above requirements including project examples
d. If applicable demonstrate previous successful project installations for the Cleveland Clinic

2. For tree planting the contractor shall meet the following qualifications:

a. Certified arborist consultant available for guidance on the project
b. Local representation and offices in the State, or an adjoining State, where the work is to be performed
c. Minimum of 5 years of experience planting and stabilizing trees of the same size, species and quantity as shown on the plans

C. Codes, Regulations and Standards:

1. All plants and planting material shall meet or exceed the Specifications of Federal, State and County laws requiring inspection for disease and insect control.

2. Quality and Size:
   a. General: Quality and size shall conform to the current edition of ‘Horticultural Standards’ for number one grade nursery stock as adopted by the American Association of Nurseriesmen.
   b. Deciduous Trees: Deciduous trees will measure in units of an average caliper at point 6-12 inches above the ground.
   c. Evergreen trees will measure in units of average height in feet above the ground.
   d. Plant stock: Each ball shall be of sufficient size to insure successful fibrous feeding roots necessary to insure successful recovery and development of the plant.
   e. Topsoil shall conform to ASTM D 5268-92.

D. Work Scheduling:

1. The Construction Management (CM) team is to provide the design team and all consultants with a complete project schedule prior to any construction operations and site/clearing/demolition. All work included in this section shall be in coordination and in strict compliance to the project benchmark dates. The Owner and the Landscape Architect shall approve any deviation from the proposed project schedule.

   a. Proceed with the work as rapidly as the site becomes available, consistent with normal seasonal limitations for planting work.
   b. Coordinate planting schedule with construction management team in order to ensure plant material is installed under the most optimum conditions.

1.3 SUBMITTALS

A. Plant Material List: Within 35 days after award of Contract, and before any planting materials are delivered to the job sites, submit to the Architect a complete list of nurseries where plants are to be obtained and any substitutions proposed to be installed.
1. Make submittal in accordance with the provisions of Division 1 of these Specifications as outlined by the Cleveland Clinic Foundation, Office of Construction.

2. Include complete data on source location, size, quality and photos of plant material listed on company/nursery letterhead as an official document. No email messages or informal notes will be accepted. The document shall list, at a minimum, the nursery location including address, telephone, fax, and email and contact name.

3. Demonstrate complete conformance with the requirements of this section.

4. This shall in no way be construed as permitting for specific items described in the drawings or these specifications unless the substitution has been approved in advance by the Architect.

5. Trees and shrubs will be tagged by the Landscape Architect and/or Owner’s Representative at the tree grower nursery prior to purchase, digging and delivery to the site if required by the Owner. (See Section 1.6-D)

6. The Landscape Architect and Owner’s Representative reserve the right to reject any plant material delivered to the site that is not in conformance with the requirements of this section. Remove rejected trees or shrubs immediately from the Project site.

B. Certificates

1. Submit certificates of inspection required by law for transportation of each shipment of plants along with proper invoicing and State certification.

2. Upon completion of the installation, deliver all certificates to the Architect.

3. File copies of certificates after acceptance of material. Inspection and approval at source does not preclude rejection of plants at the project site.

4. Plant material tags/labels shall remain fixed to all plantings until final approval by the Architect. Once final approval has been made, Contractor shall remove plant material tags/labels at the direction of the Owner and/or Landscape Architect.

C. Plant Measurement:

1. Measure according to ANSI Z60.1. Spread, height or container sizes shown on the Drawings are minimum acceptable sizes. Do not prune to obtain required sizes. If range of sizes is given, no plant shall be less than minimum size, and at least 50 percent (50%) of plants shall be as large as upper half of range specified.

   a. Trees and Shrubs: Measure with branches and trunks or canes in their normal position. Take height measurements from at or near the top of the root flare for field stock grown and container grown stock. Measure main body of tree or shrub for height
and spread. Do not measure branches or root tip to tip. Take caliper measurements 6 inches above the root flare for trees up to 4 inch caliper size, and 12 inches above the root flare for larger trees.

b. Other Plants: Measure with stems, petioles and foliage in their normal position.

1.4 PRODUCT HANDLING

A. Delivery:

1. Balled and Burlapped Stock: Care should be taken at all times as to not damage the bark or branches. Damage to the bark will result in rejection of the plant materials. Plants shall be only lifted and handled from the bottom or sides of the ball as much as possible in order to prevent damage to the plant or root ball.

2. Plant stock to be delivered B&B shall be moved with a compact ball of earth so firmly wrapped in burlap that upon delivery the soil in the ball is still firm and compacted about the small feeding roots.

3. Deliver all materials in sealed containers. Materials which become damaged and unsuitable for use shall be replaced.

4. All seed shall be labeled in accordance with U.S. Department of Agriculture Rules and Regulations. All seed shall be delivered in sealed containers.

B. Temporary Storage and Protection:

1. Protect plants at all times from sun and drying winds.

2. Plants that cannot be planted immediately on delivery shall be kept in the shade, well protected with soil, shredded hardwood mulch, straw, or other acceptable material, and shall be kept well watered.

C. Replacements: In the event of damage, immediately make all repairs and replacements necessary for the approval of the Architect and at no additional expense to the Owner.

1.5 PRODUCT SAMPLES

A. Samples

Items to be submitted prior to installation for approval by the Landscape Architect include, but are not limited to the following items:

1. Tree and Shrub Planting Fertilizer: Tablets or Granules

2. Hardwood Bark Mulch: One (1) Pint
3. Root Barrier: Two (2) Panel samples

4. Tree Earth Anchor System: Two (2) earth Anchors with Cable Attachments

5. Root Ball Tension Strap: Two (2) Nylon Straps and Ratchets

6. Topsoil Planting Mix: One (1) Pint

7. Any Additional Specific Items (Section 2.1 Materials)

1.6 SELECTION, TAGGING AND ORDERING PLANT MATERIAL

A. Documentation:

Submit documentation within 10 days after award of Contract that all plant materials have been located. Arrange procedure for review of plant material at the time of submission. The Landscape architect is to review plant material at source if required by Owner.

B. Review:

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

C. Transportation

Contractor shall accompany Landscape Architect and/or Owner to all review(s) of plant materials before any purchasing or digging of materials. 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 prior to on-site review at place of growth. Such review shall not impair the right of review and rejection during progress of the work. Plant materials shall be selected from the same geographic region as the project site experiencing similar growing conditions as the project site. This includes regions encompassing Zones 4-6 according to the USDA Plant Hardiness Zone Map.

E. Unavailable Material:
If proof is submitted that any plant specified is not attainable, a proposal will be considered for use of the nearest equivalent size or variety with the corresponding adjustment of Contract price. Size substitution increases from the size specified greater than one inch (1”) caliper size or two feet (2’) height for evergreen trees will not be allowed. Substantiate such proof in writing no later than 20 days after award of contract. Late substitutions are at the sole approval of the landscape Architect.

1.7 ANALYSIS 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.

C. Leave all nursery marking tags on a sampling of each plant material.

PART 2- PRODUCTS

2.1 MATERIAL

A. Topsoil:

General on-site topsoil shall be ¼ original on-site soil and ¾ sandy loam or loam soil as defined by the USDA Soil Conservation Service Soil Classification System. Free from admixture of subsoil, heavy clay, coarse sand, plants, roots, sticks, and other foreign materials as per ASTM D 5268-92. 95% of topsoil shall pass a 2.0 mil sieve. Organic content shall be 4% to 12% of total dry weight.

1. If the quality or quantity of on-site topsoil stockpiled is insufficient to complete the work, provide imported topsoil. Obtain rights and pay all costs for imported topsoil material:

   a. Approved Cleveland Clinic Site Topsoil Mix: Kurtz Brothers Inc. All-Purpose Topsoil or a Cleveland Clinic approved equal
   b. Approved Cleveland Clinic Lawn Preparation Mix; Kurtz Brothers, Inc. Professional Blend Topsoil, or a Cleveland Clinic approved equal
   c. Approved Cleveland Clinic Planting backfill Topsoil Mix: Kurtz Brothers, Inc. Worm Dirt Topsoil or a Cleveland Clinic approved equal

2. Proposed topsoil shall be acceptable to Architect and Soils Testing Firm.
3. Provide a history of the crops grown in and the chemicals applied to the imported topsoil.

4. Submit an analysis of both existing and imported topsoil to determine the necessary amendments and recommended rates of application for each type of plant to be grown.

5. If any existing or imported topsoil is deemed to be contaminated, a full analysis according to the following specifications shall be performed:

   a. Pre-installation Agronomic Soils Report: Submit soil analysis report at Owner’s expense for existing soil and new topsoil. Before delivery of topsoil, furnish the Landscape Architect with six (6) copies of soil analysis made by the approved soil testing laboratory stating percentages of silt, clay, sand and organic matter, pH, mineral and plant nutrient content of topsoil.

   b. Testing Agency: Contractor to submit contact information of desired soil-testing laboratory prior to providing samples to the lab for testing. Landscape Architect shall approve soil-testing laboratory prior to testing. Contractor to pay cost of testing of materials not meeting specifications as stated within. Report shall be completed within (3-5) business days of receiving any soil samples from Contractor.

   c. Submit report Three (3) weeks prior to material installation in soil analysis report; indicate suitability of soil types for ornamental trees and shrubs and lawn growth. If not suitable, state quantities of sand, organic matter, nitrogen, phosphorus, potash, and any aluminium sulphate or other soil amendments to be added to make topsoil suitable. Include recommendations to improve level of organic matter.

   d. Post-installation Agronomic Soil Reports: When all planting operations are complete, and no later than fourteen (14) days prior to final acceptance inspection, submit a soil analysis report to the Landscape Architect from four (4) different locations as directed by the Landscape Architect. The soil analysis shall be made by an approved soil testing laboratory stating percentages of silt, clay, sand, and organic matter, pH, mineral and plant nutrient content of soil. This report to aid in the long-term maintenance of installed plant material.

   e. Soil testing laboratory to be used for all soil test:

      CLC Labs, 325 Venture Drive, Westerville, Oh 43081
      Contact: 614-888-1663, clclabs@aol.com

6. Placement of the specified depth of imported topsoil shall occur in all planting areas (seed or sod and all planting beds). Compact placement of topsoil material to 80%-85% standard proctor density, and provide soil testing analysis report to Landscape Architect and Owner prior to installing plant materials.

   a. Do not cover compact topsoil. Over compacted topsoil will be loosened to a depth of 36” and re-compacted to meet specifications.

B. Seed or Sod
1. Seed or Sod meets the specifications of the following mixes. These mixes may be obtained from the approved source, or approved equal. These mixes are to be installed for the specific uses as outline herein:

   a. Standard Lawn: Seed shall be all Tall Fescue: 33% Cochise#4, 33% Bulls Eye, and 33% Rambler or equal new varieties.
   b. No Mow Lawn: Seed shall be Ohio Prairie Nursery No. LMLMO2, Freedom Lawn II Seed Mix: 25% Annual Ryegrass, 23% Creeping Red Fescue, 23% VNS Hard Fescue, 5% Kentucky Bluegrass
   c. Native Prairie: Seed shall be Ohio Prairie Nursery No. MSG01, Mesic Short Grass Seed Mix: 25% Nodding Wild Rye, 25% Little Bluestem, 25% Side-oats Grama, 25% Prairie Dropseed

2. Lime: Lime shall be ground limestone containing not less than 85% of total carbonates and shall be ground to such fineness that 50% will pass through a 200-mesh sieve and 90% will pass through a 900-mesh sieve.

3. Seed Fertilizer: Fertilizer shall be slow release Starter Mix (18-24-6) applied at the time of planting with a second application after 4-5 weeks. Fertilizer shall be uniform in composition, free flowing and suitable for application with approved equipment delivered to the site in bags or other convenient containers, each fully labeled, conforming to applicable state fertilizer laws, and bearing the name, trade name or trademark, and warranty of the producer. Each application should be applied to equal one (1) pound of nitrogen per 1000 square feet (sq. ft.) of lawn area.

C. Plants:

1. Trees, shrubs, and herbaceous plants:

   a. All trees, shrubs and herbaceous plants, deciduous plants or evergreens shall be sound, healthy, vigorous, first class, freshly dug, nursery grown in a climate similar to or more severe than Ohio.
   b. All plant material should be free of insects, their eggs and larvae.
   c. Plants shall be free of mechanical or cultural injury by rodents, and free of noticeable after effects, borers and other pests.
   d. Plants shall be true to scientific names. The names used are those of ‘Standardized Plant Names’.

D. Soil Amendments:

   ‘Soil Moist’ granular soil moisturizer Polymer Product as manufactured and distributed by JRM Chemical Inc., Cleveland, Ohio (216-475-8488), or equal if no irrigation is applied.

E. Mulch: All mulch shall be triple shredded hardwood bark dark brown in color. A 3 inch maximum thickness in all planting beds and tree rings. No soil is to cover the root flare of any tree or shrubs.
F. Fertilizer For Planting:

a. Each tree planting to receive Granular Nitroform (18-6-12) fertilizer. Apply ¼ pound per one-inch trunk diameter to the top of the root ball and extend to past the drip line. Fertilizer to be mixed in with the topsoil backfill mix around each plant.

b. Each tree and shrub to receive the landscaper’s BioNutrion (3-0-3) granular with Mycorrhizal Technology fertilizer. Apply 4 ounces per one inch trunk diameter or 1 foot of root ball and extend past the drip line. Apply 16 ounces per 100 square feet (sq. ft.) of shrub and planting bed area. Fertilizer to be mixed in with the topsoil backfill mix.

c. Shrub and Groundcover beds to receive Nitroform slow release fertilizer with an application rate of 2 lbs. of Nitrogen per every 1000 square feet of bed area at the time of installation. Fertilizer to be mixed in with the topsoil backfill mix.

G. Wood Cellulose fiber Mulch: Degradable green dyed wood cellulose fiber or 100% recycled long fiber pulp, free from weeds or other foreign matter toxic to seed germination and suitable for hydro-mulching.

H. Tackifier: Liquid concentrate diluted with water forming a transparent 3-dimensional film like crust permeable to water and air and containing no agents toxic to seed germination for stabilizing straw mulch. Agro Tacker by Agro Industries as distributed by Fireland Supply 419-668-1802.

I. Anti-Desiccant: Emulsion type, film forming agent designed to permit a transpiration but retard excessive loss of moisture from plants. Deliver in manufacturer’s fully identified containers and mix in accordance with manufacturer’s instructions.

J. Herbicide: Round up, Kleenup ,or equal.

K. Wrapping: Tree wrap tape not less than four(4) inches wide, designed to prevent bore damage and winter freezing.

L. Stake and Ties: Provide stakes of sound new hardwood, treated softwood, or redwood, free of knotholes and other defects. Tie stakes to tree trunks with flat woven polypropylene ties: Arborite Green, or approved equal. Install in accordance with manufacturers Instructions.

M. Tree Earth Anchor System: Provide Duckbill Tree support System for tree root balls anchoring in planting pit. Size of anchoring system to be per the Drawings and Details associated with the contract documents and manufacturer’s specifications. Submit samples for approval. Install in accordance with manufacturer’s instructions.

N. Erosion Control Blanket: Interlocking straw fiber blanket with degradable netting structure.
O. Soil Separator Fabric: shall be non-woven, water permeable polyester geotextile, manufactured as a landscaping product.

PART 3-EXECUTION

3.1 SURFACE CONDITIONS

A. Inspection: Prior to all work in this section, carefully inspect the installed work of all other trades and verify that all such work is complete to the point where this installation may properly commence.

1. Verify that all topsoil installation methods and approvals have been completed in accordance with this section.

2. Verify that all proposed work areas are free of weeds and rocks 3/4 inch in diameter or larger.

3. Verify percentage of compaction of existing subsoil and topsoil installation is acceptable for healthy, plant growth and root establishment with appropriate percentages of soil particles, water and air per cubic foot.

4. Verify with the Landscape Architect that topsoil installation has been approved.

B. Discrepancies:

1. In the event of any discrepancies, immediately notify the Landscape Architect.

2. Do not proceed with the installation in the areas of discrepancies until after such discrepancies have been fully resolved.

3. If quantities listed in Plant Material List do not correlate with plantings indicated on plan, the quantities on the plan shall govern.

3.2 LAYOUT

A. Shrubs and trees shall be installed within 1’-0” and groundcover shall be installed within 6” of plant location on the plan.

3.3 LAWN

A. General:

1. Planting season:

   a. Fall: Seed from August 15 to October 15
   b. Spring: Seed from time ground is workable to July 1.
c. Sod: Sod from time ground is workable to the first frost. Irrigation must be provided. Sod may be permitted as long as the weather conditions are favorable and there is availability of the material.

2. Sod or seed all areas designated on plan, and any areas disturbed by construction.
   a. If a complete underground irrigation system is installed and operational during the time of installation, all lawn work can be performed from the time ground is workable in the spring through October 15th.

3. Native Seed Mix installations shall conform to the following guidelines:
   a. Native seed mix installations shall be performed by an approved installation Contractor, meeting the experience requirements of Section 1.2-B.
   b. A native prairie grass consultant that is familiar with specific material must be included on the project team. They are not required to be selected as the native seed mix installer, but should be consulted with prior to any installation of topsoil or seed.
   c. Native prairie grass consultant shall set the specific parameters regarding topsoil and seed mix installation with an approved installation schedule meeting the project benchmark dates.
   d. Landscape Architect to provide final approval of these suggested parameters.

B. Finish grading:

1. All depressions or settled areas shall be corrected to drain positively. All stones over one inch (1”) in size, gravel, sticks, construction debris, metal and trash shall be removed.

2. Scarify subgrade to a depth of 2” minimum where topsoil is scheduled and in areas where equipment has compacted the soil.

3. Distribute topsoil to a four (4) inch depth.

4. Manually spread topsoil around trees, plants and buildings to protect from damage.

5. Areas to be sodded or seeded shall be brought to a smooth finished grade.

6. Lightly compact placed topsoil.

7. Remove surplus topsoil from site.

C. Soil preparation:

1. Lime: Where lime is required, after testing, it shall be applied at rate of 50 pounds to 1,000 square feet and raked in.
2. Give notification to the Landscape Architect of completion of Earthwork prior to proceeding with the installation of topsoil. Landscape Architect or Clinic to approve sub-grade soil conditions prior to the installation of any topsoil.

3. Give notification to the Landscape Architect of completion of Topsoil work prior to proceeding with planting operations. Landscape Architect to approve topsoil installation prior to the installation of any plant material. Compaction test shall be performed.

D. Fertilizing: See Section 2.1-B for materials.

E. Seeding and Sodding: seed and Sod all areas specifically noted on the drawings to be lawn.

1. Seed areas as follows:

   a. Rockhound all areas to loosen soil and remove rocks and weeds.
   b. After topsoil has been spread, rockhound again to remove all stones and lumps. Then spread evenly an 18-24-6 Starter fertilizer at the rate of one (1) pound of nitrogen per 1,000 square feet (sq. ft.) of lawn area and work into topsoil.
   c. Then sow evenly the grass seed mixture at a rate of 200 pounds per acre.
   d. Cover the seeded area with a thick layer of penn mulch or other comparable product with applied tackifier, or other approved means.

2. Sod areas as follows:

   a. Rockhound all areas to loosen soil and remove rocks and weeds.
   b. After topsoil has been spread, rockhound again to remove all stones and lumps. Then spread evenly an 18-24-6 Starter fertilizer at the rate of one (1) pound of nitrogen per 1,000 square feet (sq. ft.) of lawn area and work into topsoil.
   c. Then prepare and lay sod rolls so that the edges are butted up against one another leaving no unnecessary space between rolls for full coverage of sod. Offset seams whenever possible. Underside of rolls shall be kept moist prior to installation. No dry sod to be laid without proper moisture content.

3. Maintain watering (between June 15-October 15) and protection of the seeded or sodded area as needed until a full stand of grass is established and accepted by the Owner’s Representative and Landscape Architect.

4. If a temporary irrigation system is installed, it shall perform its operation through the duration outlined by the design team. Once this initial irrigation operation is completed, the Landscape Architect is to perform a site inspection to approve the establishment of the lawn areas prior to dismantling the irrigation system.

F. Hydroseeding:
1. Use a Hydromulcher (sprayer) and apply mixture(s) at the following rates. Mix in accordance with the manufacturer’s recommendations:

   a. Seed: 200lbs./acre
   b. Fertilizer: 43.6lbs./acre
   c. Tackifier: 45lbs./acre
   d. Wood cellulose, fiber mulch: 1,500 lbs./acre or straw mulch: 2 1/2 tons/acre
   e. Limestone: Rate determined by soil test.

3.4 PLANTING

A. General:

1. All planting operations shall be performed between the dates of March 1 and November 1. All plantings to be performed between the dates of June 1 and August 1 to be wilt proofed with anti-desiccant (or equal) and a watering schedule shall be maintained by the Contractor until acceptance by the Owner.
2. Plant areas: Planting areas are pits, or prepared planting beds for trees, shrubs and vines where indicated on the drawings.
3. Topsoil for planting operations shall be furnished by the Contractor as specified within.
4. The depth of planting areas is the depth below the finished grade.
5. Provide positive drainage away from all buildings and around or away from all planting beds to prevent ponding of water. Do not raise bed grades or finished grades above finished floor elevations, keep at least 2” below Finished Floor elevations.
6. Give notification to Landscape Architect of completion of Earthwork prior to proceeding with installation of topsoil. Landscape Architect to approve sub-grade soil conditions prior to the installation of any topsoil.
7. Give notification to the Landscape Architect of completion of Topsoil work prior to proceeding with planting operations. Landscape Architect to approve topsoil installation prior to the installation of any plant material.

B. Shrubs:

1. General:

   a. Planting areas shall have a backfill soil mixture minimum depth of 6” for all plants.
   b. Remove all twine, wires and burlap from the top 1/3rd of root ball.
   c. On the bottom of all plant areas, add and lightly tamp a layer of planting backfill soil mixture at least six inches (6”) thick or as much as necessary so that the ball or roots will rest thereon when the plant is set to the required grade.
**d.** Set all plants so that when they are settled they will bear the same relation to the required grade as they bore to the natural grade before being transplanted. Make adjustment of position where necessary or as directed.

**e.** Plant in topsoil backfill mix in the center of the pit unless otherwise specified on the Drawings. Remove all non-treated or non-rot-proofed burlap, ropes, stave, etc., off sides and tops of balls and remove from the pit before it is filled in. Completely remove all treated or polypropylene burlap or ropes from the planting pits.

**f.** Do not mat roots of bare-rooted together, but arrange in their natural state and work topsoil in among them. Use no soil in a frozen or muddy condition for backfilling. Do not fill around trunks or stems. Properly cut off all broken or frayed roots.

**g.** Width of the pits—at least 2 times greater in diameter than their ball of earth or spread of roots.

**h.** Each shrub to receive The Landscaper’s BioNutrition (3-0-3) Granular with Mycorrhizal Technology fertilizer. Fertilize to be mixed in with the topsoil backfill mix.

**i.** Set shrubs so as to allow sufficient depth. Properly set the crown of plant at the finished surface of the bed.

**j.** Backfill topsoil and fertilizer mix about the roots and thoroughly settles by watering.

2. **Groundcover beds:**

   **a.** Prepare beds prior to planting to a minimum depth of 6 inches. Apply 16 ounces of Landscaper’s BioNutrition (3-0-3) Granular with Mycorrhizal Technology per 100 square feet (SF) of shrub and planting bed area.

   **b.** Edge the bed in a neat line as directed and make sure an even 6” layer of topsoil remains over the entire bed area.

   **c.** Dress all beds with a uniform 3” layer of triple shredded Hardwood bark. No soil is to cover the root flare of any shrub.

**C. Trees:**

1. **Tree pits:**

   **a.** Remove all twine, wires and burlap from the top 1/3 of root ball to expose the root flare of the tree.

   **b.** Depth of the pits—deep enough as is necessary to accommodate the ball or roots and to permit the required preparation of the bottom of the pit so that when the tree is settled in the pit, it will not be necessary to raise or lower the tree. The top of the root flare should be at the top of the tree pit.

   **c.** Width of the pits—2 times greater in diameter than their ball of earth or spread of the roots.

   **d.** Plant trees in topsoil backfill mix in the center of the pit unless otherwise specified or shown on the Drawings. Remove all non-treated or non-rot proofed burlap, ropes, staves, etc., off sides and tops of balls and remove from the pit before it is filled in. Completely remove all treated or polypropylene burlap or ropes from the planting pits.
2. **Fertilizer:**
   a. When the tree has been properly set, backfill tree pit halfway and place specified fertilizer beside root ball about 1” from the root tips. Do not place in bottom of hole. Backfill tree pit the rest of the way with backfill planting soil mixture.
   b. Each tree planting to receive . The Landscaper’s BioNutrition (3-0-3) Granular with Mycorrhizal Technology fertilizer. Apply ¼ pound per one-inch trunk diameter to the top of the root ball and extend to edge of tree pit.
   c. Thoroughly tamp and water during and after backfilling.

3. All trees are to be wrapped, and receive underground stabilization as detailed and specified within.

4. Dress all tree pits with a uniform 3” layer of triple shredded hardwood bark. No soil is to cover the root flare of any tree.

D. **Ground Cover:**

1. All ground cover beds shall have a minimum depth of 6 inches of topsoil backfill mix.

2. Dress all beds with a uniform 3” layer of triple shredded hardwood bark. No soil is to cover the root flare of any tree or shrub.

E. **Pruning:**

1. Prune all new trees and shrubs in accordance with acceptable standard practices. In the same manner prune any existing trees, which are to remain if indicated on the landscape plan. Pay close attention to any branches that may have been damaged by equipment during construction.

F. **Protection:**

1. Protect all planting areas and plants from damage. If any plants are injured, treat and replace as required. Execute no work in or over prepared planting areas, or adjacent to planting without proper safeguards and protection.

G. **Maintenance during Installation:**

1. Maintain immediately following the accomplishment of planting operations of any plant unit. Owner to supply water for planting, Contractor to supply all labor and equipment for the watering operation until final acceptance. Contractor to supply landscape watering for maintenance whether a permanent irrigation system is installed or not.
2. Soak root balls and spray foliage on all trees and shrubs with water, where required, during the evening after sundown or otherwise as directed. Watering for seeded or sodded lawns shall occur 3 times per day for the first 2 weeks after installation. Seeded lawns need to be watered this way until germination of the seed takes place. Sodded lawns watering need to be in place until roots take hold into the soil, then watering amounts should be reduced. Keep all plantings in a healthy, growing condition by watering, weeding, cultivating, pruning, spraying, trimming and by performing any other necessary operations of maintenance.

3. The Contractor shall be responsible for continued proper care of the lawn areas during the period when the grass is becoming established. The period of maintenance for all lawns areas shall extend for sixty (60) days with three mowings required or as long as necessary to establish over the entire lawn area a uniform stand of grasses as specified, free of weeds and undesirable grasses. After the required maintenance period and upon acceptance of lawn areas by the Landscape architect, the Owner will assume maintenance responsibility. Fertilizing and Mowing shall be included in the maintenance of the lawn until final acceptance. These operations may extend past outlined thresholds if final acceptance does not occur within the first sixty (60) days.

4. Mowing: The lawn-seeded areas shall be mowed with approved mowing equipment to a height of three inches (3”) and kept at a consistent height throughout. It is the responsibility of the Landscape Contractor to keep the lawn at a consistent three inch (3”) height for the duration of the maintenance period. If weeds or other undesirable vegetation threaten to smother the planted species, such vegetation shall be mowed, or in the case of exceedingly rank growths, be uprooted, raked and removed from the area.

5. Re-fertilization: Areas that need to be re-fertilized will be designated by the Landscape Architect at least fifteen (15) days prior to that time that the application is required. The fertilizer shall be distributed on the sodded or seeded areas between April 1st and October 15th, during a period when the grass is dry. The fertilizer shall be as specified in Section2.1-B for Seed or Sod.

6. Reseeding: Areas that need reseeding will be designated by the Landscape Architect at least fifteen (15) days prior to the period specified for reseeding. Reseeding shall be with the seed specified therein before and shall be spread at four (4) Pounds per one thousand (1,000) square feet in a matter which will cause a minimum disturbance to the existing stand of grass, and at an angle of not less than fifteen (15) degrees from the direction of the rows of prior seeding. Topsoil shall be scarified in the area to be reseeded on the top one-inch (1”) of topsoil surface to loosening prior to seeding. Any areas that do not show a satisfactory germination of grass shall be reseeded until a dense lawn of permanent grass, free of bare spots, areas of washout or erosion damage has been established.

7. Re-Sodding: Areas that require re-sodding will be designated by the Landscape Architect at least fifteen (15) days prior to the period specified for re-sodding. Re-sodding shall be with the sod specified therein before and shall be rolled in a manner
which will cause a minimum disturbance to the existing stand of grass., and with moisture content as outlined previously. Soil shall be scarified in the sodded areas on the top one-inch (1") of topsoil to loosen prior to re-sodding. Any areas that do not show a satisfactory establishment of grass shall be resodded until a dense lawn of permanent grass, free of bare spots, areas of washout or erosion damage has been established.

8. Lawns shall be protected against damage including wind/water erosion and washouts. Damaged areas shall be promptly replanted and mulch shall be replaced.

9. The Contractor is responsible to clean the site of all mulching materials and other debris prior to the final inspection.

10. Final Inspection: Inspection of work for lawns will be made after the third cutting; written notice requesting inspection shall be submitted at least ten (10) days prior to anticipation date.

11. Acceptance: Final acceptance shall determine acceptance or non-acceptance of lawn areas. Acceptance indicates a complete cover of grasses in all lawn areas, which have been maintained by weeding, reseeding and refertilizing as necessary, watering and mowing as stated above and appears to be in a potential healthy state with weeds, rocks, stones and debris removed and all erosion or ruts repaired. Lawns not maintained or appearing as stated herein shall be unacceptable and shall be reworked as necessary until desired results are obtained.

12. Maintain trees, shrubs and other plants until final acceptance, but in no case less than 60 days after substantial completion of planting.

13. Maintain trees, shrubs and other plants by pruning, fertilizing, spraying, cultivating, watering and weeding as required for healthy growth. Restore planting saucers. Tighten and repair underground staking system and rest trees and shrubs to proper grades and vertical position as required. Restore or replace damaged wrappings. Spray as required to keep trees and shrubs free from insects and diseases.

14. Long Term Maintenance Period and Final Acceptance: Landscape Maintenance if included in this document for additional items related to specific landscape maintenance operations must adhere to the Cleveland Clinic Landscape Maintenance Scope of Work requirements

3.5 BIORETENTION AREAS

A. Soils:

1. Rain Gardens, Bioswales and all other Bioretention Areas shall conform to the soil specifications outlined in Section 2.1-A Topsoil
a. Bioretention soil shall be 70% sand by volume (less than 5% Clay/Silt Mix), 30% Composted Leaves or peat by volume, sand to leaf ratio 3:1 by volume, pH 6.0-6.5, Permeability greater than 1’ per day, Free of stones, stumps, roots, brush or seeds of noxious weeds.

b. Minimize the compaction of the soil during installation. Contractor shall provide one (1) soil test during installation to confirm pH, organic content, soil classification, permeability and grain size analysis.

c. Approved Cleveland Clinic Biorention Mix: Kurtz Brothers, Inc. Hydro Clear Bioretention Soil, or approved equal.

B. Installation Methods:

1. Bioretention Areas are to be used in areas such as landscape islands in parking lots, etc. the main purpose is to hold storm water runoff for four to six hours after a storm event, allowing it to infiltrate into the soil and act as a filter for improving water quality.

2. The constructed bioretention area shall be protected from sediment resulting from other construction activities at all times. Any rain garden or bioswale shall not be used as a sediment control facility. No heavy equipment shall operate within the bioretention area during excavation, backfilling, planting or mulching of the area.

3. The bioretention area shall be excavated at the locations shown on the plans. The method of excavation shall minimize the compaction of the bottom of the cell. During construction, low ground-contact pressure equipment shall be used. Any excavated spoils which cannot be utilized on-site, shall be disposed of at the Contractor’s expense in accordance with all local, state and federal regulations.

4. Plant material shall conform to the American Standard for Nursery Stock and selected from a certified and reputable nursery. The Contractor shall follow all planting requirements as set forth by standard industry practices as outlined herein.

5. In general, plant roots balls shall be planted so that ¼ of the root ball is above finished grade. Diameter of planting pit shall be at least 6 inches larger than diameter of planting cube or ball. Grasses and legume seed shall be drilled into the soil to a depth of at least one (1”) inch.

6. The Contractor shall provide a guarantee for all plant material that will remain healthy and viable for one year from the time of planting and final inspection and acceptance by the Owner or it shall be replaced in a kind at no charge to the Owner for materials or labor. Irrigation is permitted during the period of establishment and during severe drought conditions.
7. It shall be the responsibility of the Owner to notify the Contractor if maintenance of all plantings, including watering, is not in compliance with the guarantee during such period. All replaced plant materials shall be guaranteed for one year from the date of planting. Plant material shall be replaced per the above guarantee, if the plant is more than 25% dead or unsightly, or as determined by the Owner and Landscape Architect.

3.6 CLEAN UP

A. Upon completion of the planting, all excess soil, stones and debris, which has not previously been cleaned up, shall be removed from the site or disposed of as directed by the Landscape Architect.

B. Power wash all sidewalks, curbs and paved areas that have topsoil or other material stains that would affect the aesthetic appearance of the installed elements. Power washing must adhere to the new EPA regulations for the National Pollution Discharge Elimination System.

C. Any soil, peat or similar material which has been brought onto paved areas by hauling operations or otherwise, shall be removed promptly, keeping these areas clean at all times.

D. Protect landscape work and materials from damaged due to landscape operations, contractors and trades and trespassers. Maintain protection during installation and maintenance periods. Treat, repair or replace damaged landscape work as directed.

3.7 ACCEPTANCE

A. Final Inspection:

1. Inspection: At the conclusion of the contract work, exclusive of maintenance and replacement, one inspection will be made by the Landscape Architect. Written notice to the Landscape Architect requesting such an inspection shall be submitted by the Contractor at least ten (10) days prior to the anticipated date.

2. The purpose of this inspection will be determined whether or not the Contractor has completed all the work of the contract meeting all specifications outlined herein.

3. The condition of the lawns, trees and shrubs will be noted and determination made by the Landscape Architect whether maintenance shall continue in any part as specified under Section 3.4-G above.

B. Acceptance Inspection:

1. At the conclusion of the maintenance period, an inspection will be made by the Landscape Architect and Owners Representative. Written notice requesting the inspection
shall be submitted by the Contractor at least ten (10) working days prior to the anticipated date.

2. The purpose of the inspection shall be for the acceptance of the contract work including maintenance, but exclusive of replacements.

3. After the inspection of the Landscape Architect, the Contractor shall be notified in writing of acceptance of all the work. If there are any deficiencies in the maintenance, the Contractor will be notified of these deficiencies in writing by the Landscape Architect, and the work shall be subject to re-inspection before acceptance.

C. Guarantee Period:

1. Guarantee period shall begin at the issuance of the Certificate of Completion, or the completion date set by the project design team and shall extend exactly one year from that date.

2. At the conclusion of the guarantee period, a final inspection of the work will be made to determine the condition of the plant material. All plant material not in a healthy or 40% defoliated growing condition will be noted.

3. Remove the materials so noted from the site at the direction of the landscape Architect and replace during the following planting season with the materials of like kind and size and in a manner specified by the original planting at no extra cost.

4. Lawns not exhibiting a healthy full dense stand of grass shall be noted.
   a. No bare spots greater than 1 square foot.
   b. No more than 10% of total area with bare spots greater than 6 inches square.
   c. Free from weeds
   d. Grass height of 3 inches

5. Renovate or reseed the unsatisfactory potions of lawn

6. Guarantee period also applies to replaced material.