SECTION 32 90 10- SEEDING

PART 1 - GENERAL

1.01 GENERAL PROVISIONS:

A. The CONDITIONS OF THE CONTRACT and all Sections of Division 1 are hereby made a part of this Section.

1.02 DESCRIPTION OF WORK

A. Work Included: Provide labor, materials, and equipment necessary to complete the work of this Section, and, without limiting the generality thereof, furnish and install the following:

1. Lawns and seeding.
   a. Include restoration of existing lawn areas disturbed by Work of Contract, as well as new lawn work indicated.
   b. Include restoration of existing seeded areas disturbed by Work of Contract.
2. Fine grading.
3. Topsoil, including placing, spreading, furnishing of additional topsoil from off site as required.

B. Related Work: Examine Contract Documents for requirements that affect work of this Section. Other Specification Sections that directly relate to work of this Section include but are not limited to:

1. Subgrade Elevations: Excavation, backfilling and grading required to establish elevations as indicated: SECTION 32 22 00.

C. Alternates, Allowances, Unit Prices: Refer to SECTION 01 21 00 to determine extent, if any, work of this Section will be affected by any Alternates, Allowances or Unit Prices.

1.03 QUALITY ASSURANCE; SUBMITTALS:

A. General: Comply with requirements of SECTION 01 40 00 - QUALITY ASSURANCE; SUBMITTALS.

B. Subcontracting: For coordination purposes, subcontract lawns and planting work to a single firm specializing in landscape work.

C. Source Quality Control:
1. General: Ship seeding materials with certificates of inspection required by governing authorities. Comply with regulations applicable to landscape materials.
2. Do not make substitutions. If specified landscape material is not obtainable, submit non-availability to Architect, together with proposal for use of equivalent material. When authorized, adjustment of contract amount will be made.

3. Analysis and Standards: Package standard products with manufacturer's certified analysis. For other materials, provide analysis by recognized laboratory made in

accordance with methods established by the Association of Official Agriculture Chemists, wherever applicable.

4. Imported Topsoil: Before delivery of imported topsoil, furnish Architect with written statement giving location of properties from which topsoil is to be obtained, names and addresses of owners, depth to be stripped, and crops grown during past 2 years.

5. Topsoil Testing: Provide soils testing by an approved soil testing laboratory, for both existing stockpiled topsoil and any topsoil imported from other sources. Submit following materials certification for each source of topsoil used:

   a. Ph Factor.
   b. Mechanical Analysis.
   c. Percentage of Organic Content.
   d. Gradation Analysis
   e. Recommendations on type and quantity of additives required to establish satisfactory Ph factor, soil gradation, and supply of nutrients to bring topsoil to satisfactory level for planting.

D. Certification: Submit certificates of inspection as required by governmental authorities. Submit manufacturer's or vendors certified analysis for soil amendments and fertilizer materials. Submit other data substantiating that materials comply with specified requirements.

1. Submit seed vendor's certified statement for each grass seed mixture required, stating botanical and common name, percentage by weight, and percentages of purity, germination, and weed seed for each grass seed species.

E. Materials Samples: Submit following material samples: Mulch.

F. Seeding Schedule: Submit proposed schedule for lawn work, indicating dates for each type of seeding during normal seasons for such work in area of site. Correlate with specified maintenance periods to provide maintenance from date of substantial completion. Once accepted, revise dates only after request in writing including documentation of reason for delays, and approval of Architect.

G. Maintenance Instruction: Submit typewritten instructions recommending procedures to be established by Owner for maintenance of seeding work for one full year. Submit prior to expiration of required maintenance period(s).

1.04 DELIVERY, STORAGE AND HANDLING:

A. Packaged Materials: Deliver packaged materials in original, unopened and undamaged containers showing weight, analysis and name of manufacturer. Protect materials from deterioration during delivery, and while stored at site.

B. Topsoil: Provide only dry, loose topsoil complying with requirements. Frozen or muddy topsoil will not be permitted.

1.05 JOB CONDITIONS:

A. General: Proceed with and complete seeding work as rapidly as portions of site become available, working with seasonal limitations for each kind of landscape work required.

B. Utilities: Determine location of underground utilities and perform work in a manner which will avoid possible damage. Hand excavate, as required. Maintain grade stakes set by others until removal is mutually agreed upon by parties concerned.

C. Excavation: When conditions detrimental to plant growth are encountered, such as rubble fill, adverse drainage conditions, or obstructions, notify Architect before placing topsoil or seeding.

D. Seeding Season: Unless variance is requested in writing and approved by Architect, perform seeding only during following periods:

1. Lawns: April 1 to July 1, August 15 to September 30.

1.06 SPECIAL PROJECT WARRANTY:

A. Lawns: Warranty lawns through specified lawn maintenance period, and until Final Acceptance of Project.

B. Warranty shall not include damage or loss of trees, plants, or ground covers caused by fires, floods, freezing rains, lightening storms, or winds over 75 miles per hour, winter kill caused by extreme cold and severe winter conditions not typical of planting area; acts of vandalism or negligence on part of Owner.

C. Make necessary repairs to grades, lawn areas and paving required because of seeding repairs or replacements. Such repairs shall be done at no cost to Owner.

PART 2 - PRODUCTS

2.01 TOPSOIL:

A. General: Topsoil may be available on-site for re-use in landscape work. Contractor shall provide additional topsoil if needed as required to complete landscape work.

B. Topsoil Material: Fertile, friable, natural topsoil of loamy character, without admixture of subsoil material, obtained from a well-drained arable site, free from all clay, lumps, coarse sands, stones, plants, roots, sticks, and other foreign materials greater than 1" in every dimension, with acidity range of between Ph 5.0 and 7.0, and shall contain not less than 6% organic matter by weight as determined by loss on ignition of moisture-free samples as dried at 65 degrees C.

1. Use only topsoil, whether stockpiled on site or imported, which is representative of topsoil soil test report as specified under Paragraph QUALITY ASSURANCE; SUBMITTALS.

2. Obtain topsoil only from local sources or from areas having similar soil characteristics to that found at project site. Obtain topsoil only from naturally, well-drained sites where topsoil occurs in a depth of not less than 4 inches; do not obtain from bogs or marshes.

a. Use only material from sources identified to and approved by Architect, and listed in the topsoil soils test report.

b. Topsoil, whether stripped or imported from off-site shall be a sandy loam or loam soil as defined by the USDA Soil Conservation Service, Soil Classification System, and have the following mechanical analysis:

Textural Class	% of Total Weight	Average %
Sand (0.05- 2.0 mm)	45 to 75%	60%
Silt (0.002- 0.05 mm)	15 to 35%	25%
Clay (< 0.002 mm)	5 to 25%	15%

2.02 SOIL AMENDMENTS:

A. Fertilizer: Provide a complete fertilizer and a standard product complying with the State and United States fertilizer laws. Deliver to site in original unopened containers which shall bear the manufacturer's name and guaranteed statement of analysis. At least 40 percent by weight of the nitrogen content of fertilizer shall be derived from organic materials.

1. Granular Fertilizer for Lawn Areas: Contain not less than 10 percent nitrogen,10 percent phosphorous, and 10 percent potash by weight of ingredients or as otherwise indicated by topsoil test results.

B. Superphosphate: Finely ground phosphate rock as commonly used for agricultural purposes, containing not less than 18 percent available phosphoric acid.

C. Sand: Clean, washed sand, free of toxic materials.

D. Ground Limestone: Dolomitic limestone and contain not less than 85 percent of total carbonates and magnesium, ground to such fineness that 50 percent will pass a 100 mesh sieve and 90 percent will pass through a 20 mesh sieve. Coarser material will be accepted provided the specified rates of application are increased proportionately on the basis of quantities passing the 100 mesh sieve.

E. Aluminum Sulfate: Commercial grade, unadultered and delivered in containers with name of material and manufacturer, and net weight of contents.

F. Humus: Reed peat, sedge peat or moss peat furnished air dried, finely shredded, and suitable for horticultural use.

G. Manure: Well rotted, unleached stable or cattle manure containing not more than 25% by volume of straw sawdust, or other bedding materials and containing no chemicals or ingredients harmful to plants.

H. Mulch for Seeded Areas:

1. Mechanical Seeding Method: Provide long fibered salt hay or threshold straw, free from noxious weeds and other undesirable material. Use no material which is excessively wet, decayed, or compacted as to inhibit even and uniform spreading. Use no chopped hay, grass clippings or other short fibered material unless directed by Architect.

2. Hydraulic Spray Method: Provide cellulose fiber mulch consisting of natural wood, recycled paper or humus cellulose fiber containing no materials which will inhibit seed germination or plant growth. Add sufficient quantity of non-toxic water soluble green dye to provide a definite color contrast to ground surface to aid in uniform distribution.

   a. Provide cellulose fiber mulch in moisture-resistant, sealed bags marked with manufacturer's name, air dry weight, and composition of contents.

2.03 GRASS MATERIALS:

A. Grass Seed: Provide fresh, clean, new-crop seed complying with tolerance for purity and germination established by Official Seed Analysts of North America. Provide seed mixture composed of grass species, proportions and minimum percentages of purity, germination, and maximum percentage of weed seed, as specified.

B. Seed mixture: Provide fresh, clean, new crop seed. Seed may be mixed by an approved method on the site or may be mixed by dealer. If seed is mixed on site, deliver each variety in original containers bearing the dealer's guaranteed analysis. If seed is mixed by dealer, Seeding Contractor shall furnish to Architect dealer's guaranteed statement of the composition of the mixture and percentage of purity and germination of each variety.

C. Purchase seed only from a recognized distributor, and composed of following varieties mixed in proportions indicated. Seed shall test to minimum percentages of purity and germination specified.

D. LawnSeedMixture:

'Yardscaper Mix'	Proportion by Weight	% Germination
Improved Perennial Ryegrass	30%	90
Kentucky Bluegrass	20%	80
Creeping Red Fescue	40%	85
Chewing Fescue	20%	80

E. Rain Garden Seed Mix

Name	Proportion by Weight	% Germination
Little Bluestem Grass	30%	80
Virginia Wild Rye	15%	80
Cosmos Sedge, PA Ecotype	5%	80
Fox Sedge, PA Ecotype	10%	80
Purple Coneflower	5%	
Marsh Blazing Star, PA Ecotype	5%	
Black Eye Susan, Coastal Plain NC Ecotype	5%	
Tall White beard Tongue, PA Ecotype	5%	
Common Milkweed, PA Ecotype	3%	
New England Aster	2%	
Big Bluestem, "Niagara"	5%	
Blue Flag, PA Ecotype	3%	
Square Stemmed Monkey Flower, PA Ecotype	3%	
Gray Headed Coneflower, OH Ecotype	4%	

2.04 MISCELLANEOUS SEEDING MATERIALS:

A. Anti-Erosion Mulch: Provide clean, seed-free salt hay or threshed straw of wheat, rye, oats or barley.

PART 3 - EXECUTION

3.01 PREPARATION

A. General: Stake seeding locations and outline areas and secure Architect's acceptance before start of planting work. Make minor adjustments as may be requested.

1. NOTE: Notify Architect and allow opportunity for observing subgrade conditions prior to placing/spreading of any topsoil.

B. Planting Soil (Topsoil) Depths: Unless indicated otherwise, provide planting soil depths not less than 4" for all lawn areas.

C. Preparation for Planting Lawns at Changed Grades:

1. Loosen subgrade of lawn areas to a minimum depth of 4 inches. Remove stones over 1-1/2 inch in any dimension and sticks, roots, rubbish and other extraneous matter. Limit preparation to areas which will be planted promptly after preparation.

2. Place approximately ½ of total amount of top soil required. Work into top of loosened subgrade to create a transition layer and then place remainder of planting soil. Add specified soil amendments and mix thoroughly into upper 4 inches of topsoil.

D. Preparation for Planting Lawns at Unchanged Grades: Where lawns are to be planted in areas that have not been altered or disturbed by excavating, grading, or stripping operations, prepare soil for lawn planting as follows: Till to a depth of not less than 6 inches; apply soil amendments and initial fertilizers as specified; remove high areas and fill in depressions; till soil to a homogenous mixture of fine texture, free of all lumps, clods, stones, roots and other extraneous matter.

1. Apply specified commercial fertilizer at rates specified and thoroughly mix into upper 2 inches of topsoil. Delay application of fertilizer if lawn planting will not follow within a few days.

2. Prior to preparation of unchanged areas, remove existing grass, vegetation and turf. Dispose of such material outside of Owner's property; do not turn over into soil being prepared for lawns.

E. Preparation for Planting Lawns, General:

1. Fine grade lawn areas to smooth, even surface with loose, uniformly fine texture. Roll, rake and drag lawn areas, remove ridges and fill depressions, as required to meet finish grades. Remove all lumps, clots, stones, roots, and other extraneous

matter greater than 1" size. Limit fine grading to areas which can be planted immediately after grading.

2. Moisten prepared lawn areas before planting if soil is dry. Water thoroughly and allow surface moisture to dry before planting lawns. Do not create a muddy soil condition.

3. Restore lawn areas to specified condition if eroded or otherwise disturbed after fine grading and prior to planting.

F. Application to Topsoil Additives:

1. Applying Fertilizers: Apply commercial fertilizer and work thoroughly into topsoil in two applications. Apply first application one week before seeding, at rate of 35-pounds per 1,000 square feet, harrowed into top 2-inches of seed bed. Apply second application as determined by test results.

2. Applying Superphosphate: Incorporate superphosphate into topsoil with first application of commercial fertilizer, at rate of 25-pounds per 1,000 square feet or at rate determined from test results.

3. Applying ground limestone: After topsoil has been spread and graded, and if recommended as result of the soil analysis, apply ground limestone at rate of 50-pounds per 1,000 square feet or at rate recommended by Testing Laboratory.

3.02 HYDROSEEDING NEW LAWNS:

A. NOTE: Hydroseeding method is required for seeding except as otherwise approved by Architect.

B. Apply slurry uniformly to all areas to be seeded. Provide rate of application as required to obtain specified seed sowing rate.

C. Do not use wet seed or seed which is moldy or otherwise damaged in transit or storage.

D. Application Rate: Sow seed mixture at rate of five (5.0) pounds per 1,000 square feet.

E. Protect seeded areas against erosion by spreading specified lawn mulch after completion of seeding operations. Spread uniformly to form a continuous blanket not less than 1-1/2 inch loose measurement over seeded areas.

1. Protect seeded slopes greater than 1:3 against erosion with erosion netting or other methods acceptable to Architect.

3.03 SEEDING NEW LAWNS (MECHANICAL):

A. NOTE: Mechanical seeding may be used only for lawn restoration or for small areas specifically approved in advance by Architect.

B. Do not use wet seed or seed which is moldy or otherwise damaged in transit or storage.

C. Sow seed using a spreader or seeding machine. Do not seed when wind velocity exceeds 5 miles per hour. Distribute seed evenly over entire area by sowing equal quantity in 2

directions at right angles to each other.

D. Application Rate: Sow seed mixture at rate of four and ½ (4.5) pounds per 1,000 square feet.

E. Rake seed lightly into top 1/8 inch of soil, roll lightly with hand roller weighing approximately 100 pounds per foot of width, and water with fine spray.

F. Protect seeded areas against erosion by spreading specified lawn mulch after completion of seeding operations. Spread uniformly to form a continuous blanket not less than 1-1/2 inch loose measurement over seeded areas.

3.04 PROTECTION OF SEEDED SLOPES AND DITCHES:

A. Protect seeded slopes and drainage ditches against erosion with erosion netting or other methods acceptable to Engineer/Owner's Representative.

B. Mulch: Spread specified lawn mulch after completion of seeding operations to form a continuous blanket not less than 1 ½" loose measurement over seeded areas.

C. Anchor mulch by spraying with asphalt emulsion at the rate of 10 to 13 gallons per 1000 square feet. Take precautions to prevent damage or staining of construction or other plantings adjacent to mulched areas.

D. Cover seeded slopes, drainage swales, and areas where noted with erosion control blanket. Roll matting down over slopes without stretching or pulling.

E. Lay erosion control blanket smoothly on soil surface, burying top end of each section in narrow 6 inch trench. Leave 12 inch overlap from top roll over bottom roll. Leave 4 inch overlap over adjacent section.

F. Staple outside edges and overlaps at 36 inch intervals.

G. Lightly dress slopes with topsoil to ensure close contact between matting and soil.

H. In ditches, unroll matting in direction of flow. Overlap ends of strips 6 inches with upstream section on top.

3.05 RECONDITIONING EXISTING LAWNS:

A. Recondition existing lawn areas damaged by Contract operations including storage of materials and equipment and movement of vehicles. Also recondition existing lawn areas where minor regrading is required.

B. Provide fertilizer, seed or sod and soil amendments as specified for new lawns and as required to provide a satisfactorily reconditioned lawn. Provide new topsoil as required to fill low spots and meet new finish grades.

C. Cultivate bare and compacted areas thoroughly to provide satisfactory, planting bed.

D. Remove diseased and unsatisfactory lawn areas; do not bury into soil. Remove topsoil containing foreign materials resulting from Contractor's operations including oil drippings, stone, gravel, and other loose building materials.

E. Where substantial lawn remains (but is thin), mow, rake, aerate if compacted, fill low spots, remove humps and cultivate soil, fertilize, and seed. Remove weeds before seeding or if extensive, apply selective chemical weed killers as required. Apply a seedbed mulch, if required, to maintain moist condition.

F. Water newly planted areas and keep moist until new grass is established.

3.06 CLEANUP AND PROTECTION:

A. During seeding work, keep pavements clean and work areas in orderly condition.

B. Protect seeding work and materials from damage due to seeding operations, operations by other contractors and trades and trespassers. Maintain protection during installation and maintenance periods. Treat, repair or replace damaged seeding work as directed.

3.07 MAINTENANCE AND ACCEPTANCE:

A. Maintenance: Begin maintenance immediately after seeding.

1. Maintain grassed areas by watering (on a daily basis during germination), fertilizing, weeding, mowing whenever the grass height exceeds 3", trimming, and other operations such as rolling, regrading and replanting as required to establish a smooth, acceptable lawn, free of eroded or bare areas.
2. Maintain each lawn area until acceptance of such area.
3. Include protection such as placement of signs and barricades.
4. Repair damaged areas which do not produce a satisfactory stand of grass to re-establish the intended condition; re-fertilize, re-seed and re-mulch as required to produce satisfactory results.
5. If maintenance period extends from fall of one growing season into the following spring, Contractor shall be required to provide a spring fertilization to all lawn areas in early spring.

B. Maintenance Periods: Maintain grassed areas for not less than the period stated below, and longer as required to establish an acceptable lawn.

1. Seeded lawns, not less than 60 days after completion of seeding.

a. Exclusion: Period November 15 through April 15.

C. Acceptance: When seeding work is completed, including maintenance, Architect will, upon request, make an inspection to determine acceptability.

1. Seeding work may be inspected for acceptance in parts agreeable to Architect, provided work offered for inspection is complete, including maintenance.

2. Where inspected seeding work does not comply with requirements, replace rejected work and continue specified maintenance until reinspected by Architect and found to be acceptable. Remove rejected plants and materials promptly from Project Site.

3. Acceptance of seeded areas will be given only upon attainment of a reasonably thick uniform stand of grass of not less than 80 percent permanent grass

coverage, free from weeds or sizable thin or bare spots.

4. If all other Work of Contract has been completed and some seeded areas still have not been accepted, Contractor shall maintain such period for an additional 60 days, exclusive of periods stated below. Seeded areas will be accepted upon attainment of a reasonably thick uniform stand of grass.

   a. Maintenance Exclusion Period: November 15 through April 1. NOTE: If maintenance period extends into spring of following year Contractor shall apply spring fertilization to seeded areas according to soil test requirements.

   b. If at or near the end of such 60 day period, unacceptable areas still remain, Architect may direct a final re-seeding by Contractor or authorize the contract value of performing such work deducted from monies due to Contractor.

5. Acceptance of any seeded area shall be in writing. After acceptance, Contractor will be relieved of further expense for maintaining such areas, other than for damage caused by any Work under the Contract.

END OF SECTION 32 90 10