SECTION 310000
EARTHWORK

PART 1 GENERAL

1.01 RELATED WORK SPECIFIED ELSEWHERE

A. Cast-In-Place Concrete: Section 033000.

B. Site Restoration: Section 310101.

C. Site Clearing: Section 311000.

D. Rock Removal Section 312316.

D. Erosion and Sediment Control: Section 312513

1.02 DEFINITIONS

A. The following terms shall have the meanings ascribed to them in this Article, wherever they appear in this Section.

1. Earth Excavation: The removal of all surface and subsurface material not classified as rock (as defined below).
2. Rock: Limestone, sandstone, shale, granite, and similar material in solid beds or masses in its original or stratified position which can be removed only by blasting operations, drilling, wedging, or use of pneumatic tools, and boulders with a volume greater than 1.0 cu yd. Concrete building foundations and concrete slabs, not indicated, with a volume greater than 1.0 cu yd shall be classified as rock.

    a. Limestone, sandstone, shale, granite, and similar material in a broken or weathered condition which can be removed with an excavator or backhoe equipped with a bucket with ripping teeth or any other style bucket shall be classified as earth excavation.
    b. Masonry building foundations, whether indicated or not, shall be classified as earth excavation.

3. Subgrade Surface: Surface upon which subbase or topsoil is placed.
4. Subbase: Subbase course Type 2 which is placed immediately beneath pavement or concrete slabs.
5. Pipe Bedding: Run of bank sand or mixture of crushed stone and gravel to negate the risk of vertical deflection and deformed piping.
6. Trench Backfill: Run of bank sand or mixture of crushed stone and gravel to ensure proper compaction of pipe trenching.
7. Foundation Bearing Grade: Grade/elevation at which the bottom-of-footings are constructed.
8. Maximum Density: The dry unit weight in pounds per cubic foot of the soil at "Optimum Moisture Content" when determined by ASTM D 1557 (Modified Proctor).

9. Structures: Buildings, footings, foundations, retaining walls, slabs, tanks, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below the ground surface.
10. Landscaped Areas: Areas not covered by structures, walks, roads, paving, or parking.
11. Unauthorized Excavation: The removal of material below required elevation indicated on the Drawings or beyond lateral dimensions indicated or specified without specific written direction by the Director's Representative.
12. Contract Limit Line: Limits of grading, excavations and filling required for the work of this contract. Unless specifically noted otherwise, the Contract Limit Line and Grading Limit Line shall be considered the same.

1.03 SUBMITTALS

A. Product Data:
1. Filter Fabric: Manufacturer's catalog sheets, specifications, and installation instructions.

B. Quality Control Submittals:
1. Excavation Procedure: Submit a lay out drawing or detailed outline of intended excavation procedure for the Director's information. This submittal will not relieve the Contractor of responsibility for the successful performance of intended excavation methods.
2. Subbase Materials: Name and location of source and the DOT Source Number. If the material is not being taken from an approved DOT Source the results of the gradation and soundness tests performed by an ASTM certified soils laboratory will be required.

a. Classification according to ASTM D2487.
b. Laboratory compaction curve according to ASTM D1557.

3. Other Aggregates: Name and location of source and soil laboratory test results.

1.04 PROJECT CONDITIONS

A. Protect existing trees and plants during performance of the Work unless otherwise indicated. Box trees and plants indicated to remain within the grading limit line with temporary steel fencing or solidly constructed wood barricades as required. Protect root systems from smothering. Do not store excavated material, or allow vehicular traffic or parking within the branch drip line. Restrict foot traffic to prevent excessive compaction of soil over root systems.

B. Cold Weather Requirements:
1. Excavation: When freezing temperatures are anticipated, do not excavate to final required elevations for concrete work unless concrete can be placed immediately.
2. Backfilling: If backfill is being placed during freezing temperatures the backfilling operations shall be monitored by the Director's Representative and the following procedures shall be followed:
a. Frozen ground shall be removed in its entirety from beneath and five feet beyond the area of fill placement.

b. The fill material placed shall consist of Selected Fill and shall be free of all frozen chunks that exceed four inches in size. The material transported to the project site shall only consist of material excavated from below the frost depth.

c. At the end of the work day, the area of fill placement shall be covered with insulated blankets, or left unprotected. Other means of protection (hay, wood chips, etc.) may also be used for protection provided it is approved by the Director's Representative.

d. Following work day, remove the insulated blankets and/or strip the area of all frozen material as specified previously.

e. Upon establishing the subgrade elevations, protect the grades with insulated blankets or place additional material that will adequately insulate the exposed earth surface from frost. This additional fill or protective material shall be stripped just prior to pouring concrete.

PART 2 PRODUCTS

2.01 MATERIALS

A. Subbase Course Type 2 and Structural Fill: Stockpiled, crushed ledge rock or approved blast furnace slag. Comply with the gradation and material requirements specified below:

Sieve		Percent Passing
Sieve Size	Size opening (mm)	
2 inch	50.8	100
1/4 inch	6.35	25-60
No. 40	0.425	5-40
No. 200	0.075	0-10

1. Magnesium Sulfate Soundness Test: 20 percent maximum loss by weight after four test cycles.
2. Plasticity Index: The plasticity index of the material passing the No. 40 mesh sieve shall not exceed 5.0.
3. Elongated Particles: Not more than 30 percent, by weight, of the particles retained on a 1/2 inch sieve shall consist of flat or elongated particles. A flat or elongated particle is defined as one which has its greatest dimension more than three times its least dimension.

B. Pipe Bedding: Shall consist of clean, hard, durable, uncoated particles, free from lumps of clay and all deleterious substances and shall meet the following gradation requirements:

Sieve Size		Percent Passing
Sieve Size	Size opening (mm)	
3/4 inch	19.05	100
No. 40	0.425	0-70
No. 200	0.075	0-10

C. Trench Backfill: Sound, durable, sand, gravel, stone, or blends of these materials, free from organic and other deleterious materials. Comply with the gradation requirements specified below:

Sieve		Percent Passing
Sieve Size	Size opening (mm)	
4 inch	101.6	100
No. 40	0.425	0-70
No. 200	0.075	0-15

D. Suitable Material (Fill and Backfill for Landscaped Areas): Material consisting of mineral soil (inorganic), blasted or broken rock and similar materials of natural or man-made origin, including mixtures thereof. Maximum particle size shall not exceed 2/3 of the specified layer thickness prior to compaction. NOTE: Material containing cinders, industrial waste, sludge, building rubble, land fill, muck, and peat shall be considered unsuitable for fill and backfill, except topsoil and organic silt may be used as suitable material in landscaped areas provided it is placed in the top layer of the subgrade surface.

E. Unsuitable Material: Material containing organic material (wood, roots, stumps, decaying material, etc) and/or resulting from the clearing, grubbing, and removal of existing improvements.

F. Marker Tape: FL Industries Blackburn/Holub's Type YT6, or Seton Nameplate Corporations Type 6 ELE, imprinted with message suited to item buried below.

2.02 GEOTECHNICAL FABRICS

A. Filter Fabric (Geotextile)

1. Drainage: Amoco 1199 & 2019, Maccaferri MacTex MX140 & MX155, Mirafi 140N & 160N, Fiberweave 403 & 404, or approved equivalent.
2. Silt Fence: Stabilinka T140N, Filter X, Mirafi 100X, or approved equivalent.

PART 3 EXECUTION

3.01 PREPARATION

A. Protection

1. Prevent damage to buildings, pavement, pipes, conduits, poles and other structures above and below ground that are adjoining or included in the contract area. Repair damage resulting from the contractor's negligence.
2. Protect existing trees and shrubs not to be removed. Cut back to point of branching all broken branches and skinned areas. Treat exposed wood with tree pruning compound.
3. Store materials and equipment in cleared areas away from tree roots. Prevent employees and equipment from trampling over woodland, existing planting, and established lawns.

3.02 TREE REMOVAL AND RECYCLING

A. It is the Director's intent that trees to be removed as part of this project be felled by Park's staff prior to the start of Work. Coordinate tree cutting/felling with Director's Representative.

B. It is the Director's intent that trees to be removed as part of this project be recycled in one of the following ways:
   1. Sold to a mill for lumber production
   2. Sold to a mill for paper product production
   3. Harvested for fire wood production
   4. Other Director's Representative approved option

C. Prior to removal, provide Director's Representative with written certification from receiving facilities where timber is to be recycled. Certification shall identify proposed product use. Receiving facilities shall provide copies of material receipts and quantities to the Director's Representative.

3.03 CLEARING AND GRUBBING

A. Clear and grub the site within the Grading Limit Line (GLL) of trees, shrubs, brush, other prominent vegetation, debris, and obstructions except for those items indicated to remain. Completely remove stumps and remove roots within 18 inches of the surface.

B. Fill depressions caused by clearing and grubbing operations in accordance with the requirements for filling and backfilling, unless further excavation is indicated.

3.04 UNDERGROUND UTILITIES

A. Locate existing underground utilities prior to commencing excavation work. Determine exact utility locations by hand excavated test pits. Support and protect utilities to remain in place.

B. Do not interrupt existing utilities that are in service until temporary or new utilities are installed and operational.

C. Utilities to remain in service: Shall be re-routed as shown on the Contract Drawings.

D. Utilities abandoned beneath and five feet laterally beyond proposed site features shall be removed in their entirety. Excavations required for their removal shall be backfilled and compacted as specified herein.

E. Utilities located outside the limits specified above may be abandoned in place provided their ends are adequately plugged as described below.
   1. Permanently close open ends of abandoned underground utilities exposed by excavations, which extend outside the limits of the area to be excavated.
   2. Close open ends of metallic conduit and pipe with threaded galvanized metal caps or plastic plugs or other approved method for the type of material and size of pipe. Do not use wood plugs.
   3. Close open ends of concrete and masonry utilities with concrete or flow-able fill.

3.05 EXCAVATION

A. Excavate earth as required for the Work.

B. Install and maintain all erosion and sedimentation controls during all earthwork operations as specified on the Contract Drawings or as directed by local officials. If the erosion and sedimentation controls specified by the local officials are more stringent than those specified on the Contract Drawings contact the Director's Representative.

C. Maintain sides and slopes of excavations in a safe condition until completion of backfilling. Comply with Code of Federal Regulations Title 29 - Labor, Part 1926 (OSHA).
   1. Trenches: Deposit excavated material on one side of trench only. Trim banks of excavated material to prevent cave-ins and prevent material from falling or sliding into trench. Keep a clear footway between excavated material and trench edge. Maintain areas to allow free drainage of surface water.

D. Stockpile excavated materials classified as suitable material where directed, until required for fill. Place, grade, and shape stockpiles for proper drainage as approved by the Director's Representative.

E. Excavation for Structures: Conform to elevations, lines, and limits indicated. Excavate to a vertical tolerance of plus or minus 1 inch. Extend excavation a sufficient lateral distance to provide clearance to execute the Work.

F. Conduit, Cable, Tubing and Piping (other than Bell and Spigot): Provide sufficient trench width for installation and to accommodate special backfill when specified.

G. Unauthorized Excavations: Unless otherwise directed, backfill unauthorized excavation under footings, foundation bases, and retaining walls with compacted select granular material without altering the required footing elevation. Elsewhere, backfill and compact unauthorized excavation as specified for authorized excavation of the same classification, unless otherwise directed by the Director's Representative.
   1. Unauthorized excavations under structural Work such as footings, foundation bases, and retaining walls shall be reported immediately to the Director's Representative before any concrete or backfilling Work commences.

H. Notify the Director's Representative upon completion of excavation operations. Do not proceed with the Work until the excavation is inspected and approved. Inspection of the excavation by the Director's Representative will be made on 3 working days notice.

3.06 DEWATERING

A. Prevent surface and subsurface water from flowing into excavations and trenches and from flooding the site and surrounding area.

B. Do not allow water to accumulate in excavations or trenches. Remove water from all excavations immediately to prevent softening of foundation bottoms, undercutting footings, and soil changes detrimental to the stability of subgrades and foundations.

Furnish and maintain pumps, sumps, suction and discharge piping systems, and other system components necessary to convey the water away from the Site.

C. Convey water removed from excavations, and rain water, to collection or run-off area. Cut and maintain temporary drainage ditches and provide other necessary diversions outside excavation limits for each structure. Do not use trench excavations as temporary drainage ditches.

D. Provide temporary controls to restrict the velocity of discharged water as necessary to prevent erosion and siltation of receiving areas.

3.07 PLACING FILTER FABRIC

A. Place and overlap filter fabric in accordance with the manufacturer's installation instructions, unless otherwise shown.

B. Cover tears and other damaged areas with an additional filter fabric layer extending 3 feet beyond the damage.

C. Do not permit traffic or construction equipment directly on filter fabric.

D. Backfill over filter fabric within two weeks after placement. Backfill in accordance with the fabric manufacturer's instructions and in a manner to prevent damage to the fabric.

3.08 PLACING FILL AND BACKFILL

A. Surface Preparation of Fill Areas: Strip topsoil, remaining vegetation, and other deleterious materials prior to placement of fill. Remove all asphalt pavement in its entirety from areas requiring the placement of fill or break up old pavement(s) to a maximum size of four inches. Prior to placement of fill, smooth out and compact areas where wheel rutting has occurred due to stripping or earthwork operations.

B. Excavations: Backfill as promptly as practicable, but only after approval by the Director's Representative. Do not backfill with excavated material unless it meets the requirements of this Section.

C. Place backfill and fill materials in layers not more than 8 inches thick in loose depth unless otherwise specified. Before compaction, moisten or aerate each layer as necessary to facilitate compaction to the required density. Do not place backfill or fill material on surfaces that are muddy, frozen, or covered with ice.
   1. Place fill and backfill against foundation walls, and in confined areas (such as trenches) not easily accessible by larger compaction equipment, in maximum six inch thick (loose depth) layers.
   2. For Open Graded Stone/Clean Stone (Item B-12, No. 1 crushed stone, No. 2 crushed stone, etc.) in excess of six inches: Material must be wrapped in separation fabric.

D. Prevent wedging action of backfill against structures by placing backfill uniformly around structure to approximately same elevation in each layer. Place backfill against

walls of structures containing basements or crawl spaces only after the first floor structural members are in place.

E. Landscaped Areas: Place suitable material when required to complete fill or backfill areas up to subgrade surface elevation. Do not use material containing rocks over four inches in diameter within the top 12 inches of suitable material.

3.09 COMPACTION

A. All materials with exception of open graded stone (No. 2 Crushed Stone, Pipe Bedding, Trench Backfill etc.):
   1. Compact each layer of fill and backfill for the following area classifications to the percentage of maximum density specified below and at a moisture content suitable to obtain the required densities, but at not less than three percent drier or more than two percent wetter than the optimum content as determined by ASTM 1557 (Modified Proctor).

      a. Foundation Bearing: 95 percent.
      b. Pipes: 95 percent.
      c. Pipe Bedding: 95 percent.
      d. Landscaped Areas: 90 percent.

B. If a compacted layer fails to meet the specified percentage of maximum density, the layer will be re-compacted and retested. If compaction cannot be achieved the material/layer will be removed and replaced. No additional material may be placed over a compacted layer until the specified density is achieved

C. Open graded Stone (Item B-12, No. 1 crushed stone, etc): material in maximum twelve inch lifts. Each lift shall be raked smooth and compacted through several passes of a walk behind vibratory roller. Compaction Testing is **not** required.

3.10 GRADING

A. Rough Grading: Trim and grade area within the Grading Limit Line and excavations outside the limit line, required by this Contract, to a level of four inches below the finish grades indicated unless otherwise specified herein or where greater depths are indicated. Provide smooth uniform transition to adjacent areas.

B. Finish Grading: Finish surfaces free from irregular surface changes, and as follows:
   1. Grassed Areas: Finish areas to receive topsoil to within 1 inch above or below the required subgrade surface elevations.
   2. Pavements: Place and compact subbase material as specified. Shape surface of areas to required line, grade and cross section, with the finish surface not more than 1/2 inch above or below the required subbase elevation.

3.11 RESTORATION

A. Restore pavements, walks, curbs, lawns, and other exterior surfaces damaged during performance of the Work to match the appearance and performance of existing corresponding surfaces as closely as practicable.

3.12 DISPOSAL OF EXCESS AND UNSUITABLE MATERIALS

A. Remove from State property and dispose of excess and unsuitable materials, including materials resulting from clearing and grubbing and removal of existing improvements.

B. Transport excess and unsuitable materials, including materials resulting from clearing and grubbing and removal of existing improvements, to spoil areas on State property designated by the Director's Representative, and dispose of such materials as directed.

3.13 FIELD QUALITY CONTROL

A. Special Inspections: Owner will engage a qualified special inspector to perform the following special inspections:

1. Determine prior to placement of fill that site has been prepared in compliance with requirements.
2. Determine that fill material classification and maximum lift thickness comply with requirements.
3. Determine, during placement and compaction, that in-place density of compacted fill complies with requirements.

B. Testing Agency: Owner will engage a qualified geotechnical engineering testing agency to perform tests and inspections.

C. Allow testing agency to inspect and test subgrades and each fill or backfill layer. Proceed with subsequent earth moving only after test results for previously completed work comply with requirements. Notify the Director's Representative at least three (3) working days prior to all phases of filling and backfilling operations.

D. Footing Subgrade: At footing subgrades, at least one test of each soil stratum will be performed to verify design bearing capacities. Subsequent verification and approval of other footing subgrades may be based on a visual comparison of subgrade with tested subgrade when approved by Architect.

E. Testing agency will test compaction of soils in place according to ASTM D1556, ASTM D2167, ASTM D2937, and ASTM D6938, as applicable. Tests will be performed at the following locations and frequencies:

1. Foundation Backfill: At each compacted backfill layer, at least one test for every 4 footings but no fewer than two tests per day of work.
2. Trench Backfill: At each compacted initial and final backfill layer, at least one test for every 150 feet or less of trench length but no fewer than two tests.

F. When testing agency reports that subgrades, fills, or backfills have not achieved degree of compaction specified, scarify and moisten or aerate, or remove and replace soil materials to depth required; recompact and retest until specified compaction is obtained.

3.14 CLEAN UP

A. Remove and dispose of all logs, tree trimmings, and debris from property. Leave Work area in a neat, uncluttered condition.

END OF SECTION

SECTION 310101

SITE RESTORATION

PART 1 GENERAL

1.01 QUALITY ASSURANCE

A. Provide prepackaged seed readily available to the public with quality and purity equal to product of O.M. Scotts and Son, Marysville, OH 43041. On-the-job or made-to-order mixes will not be accepted.

1.02 DELIVERY STORAGE AND HANDLING

A. Deliver fertilizer in manufacturer's standard size bags or cartons showing weight, analysis, and the name of the manufacturer. Store as approved by Director's Representative.

B. Store all seed at the site in a cool dry place as approved by the Director's Representative. Replace any seed damaged during storage.

1.03 SCHEDULING

A. Time For Seeding: Sow grass seed between April 1 and May 15th or between August 15th and October 15th, except as otherwise approved in writing by the Director.

PART 2 PRODUCTS

2.01 TOPSOIL

A. Provide topsoil conforming to the following:
   1. Original loam topsoil, well drained homogeneous texture and of uniform grade, without the admixture of subsoil material and entirely free of dense material, hardpan, sod, or any other objectionable foreign material.
   2. Containing not less than 4 percent nor more than 20 percent organic matter in that portion of a sample passing a 1/4 inch sieve when determined by the wet combustion method on a sample dried at 105 degrees C.
   3. Containing a Ph value within the range of 4.5 to 7 on that portion of the sample that passes a 1/4 inch sieve.
   4. Containing the following gradations:

SIEVE DESIGNATION	PERCENT PASSING
1 inch	100
1/4 inch	97 - 100
No. 200	20 - 65 (of the 1/4 inch sieve)

2.02 FERTILIZER

A. Fertilizer: Mixed commercial fertilizers shall contain total nitrogen, available phosphoric acid and soluble potash in the ratio of 10-6-4 (50% N/UF). 50% of total nitrogen shall be derived from ureaform furnishing a minimum of 3.5% water insoluble nitrogen (3.5% WIN). The balance of the nitrogen shall be present as methylene urea, water-soluble urea, nitrate and ammoniacal compounds.

B. Other fertilizers meeting DOT Specification Section 713-03 Fertilizer can be used.

2.03 SEED

A. Furnish fresh, clean, new-crop seed mixed in the proportions specified for species and variety, and conforming to Federal and State Standards.

B. Acceptable material in a seed mixture other than pure live seed consists of nonviable seed, chaff, hulls, live seed of crop plants and inert matter. The percentage of weed seed shall not exceed 0.1 percent by weight.

C. All seed will be rejected if the label indicates any noxious weed seeds.

D. Provide seed mixture equal to Scotts Pure Premium Sun and Shade North Grass Seed Mixture, comprised of the following:

SEED MIXTURE			
AMOUNT BY WEIGHT IN MIXTURE	**SPECIES OR VARIETY ***	**PERCENTAGE**	
		PURITY	**GERMINATION**
20 PERCENT	ABBEY KENTUCKY BLUEGRASS BLEND	95 PERCENT	80 PERCENT
80 PERCENT	PERENNIAL RYE	98 PERCENT	85 PERCENT
100 PERCENT			

*Variety may be altered depending on availability of seed from manufacturer.

2.04 MULCH

A. Dry Application, Straw: Stalks of oats, wheat, rye or other approved crops that are free of noxious weed seeds. Weight shall be based on a 15 percent moisture content.

PART 3 EXECUTION

3.01 GRADING

A. Rough Grading: Trim and grade lawn areas within the Contract Limit to a level of 4 inches below the finish grades indicated unless otherwise specified herein or where greater depths are indicated. Provide smooth uniform transition to adjacent areas.

B. Finish Grading: Finish surfaces free from irregular surface changes, and as follows:
   1. Grassed Areas: Finish areas to receive topsoil to within 1 inch above or below the required subgrade surface elevations.

3.02 SPREADING TOPSOIL

A. Perform topsoil spreading operations only during dry weather.

B. To ensure a proper bond with topsoil, harrow or otherwise loosen the subgrade to a depth of 3 inches before spreading topsoil.

C. Spread topsoil directly upon prepared subgrade to a minimum depth measuring 4 inches after natural settlement in areas to be seeded. Smooth out unsightly variations, bumps, ridges, and depressions that will hold water. Remove stones, litter, or other objectionable material. Finished surfaces shall conform to the contour lines and elevations indicated on the drawings or fixed by the Director's Representative.

3.03 PREPARATION FOR SEEDING

A. Seed Bed: Scarify soil to a depth of 2 inches in compacted areas. Smooth out unsightly variations, bumps, ridges, and depressions that will hold water. Remove stones, litter, or other objectionable material.

3.04 FERTILIZING

A. Apply 10-6-4 fertilizer evenly at the rate of 40 pounds per 1000 sq ft .

3.05 SEEDING

A. Assume all risks when seed is sowed before approval of seed analysis.

B. Do not seed when the wind velocity exceeds 5 miles per hour.

C. Application Rate: 8 pounds per 1000 sq ft.

D. Dry Application: Sow seed evenly by hand or seed spreader on dry or moderately dry soil.

3.06 MULCHING

A. Dry Application: Within 3 days after seeding, cover the seeded areas with a uniform blanket of straw mulch at the rate of 50 pounds per 1000 sq ft of seeded area.

3.07 LAWN ESTABLISHMENT

A. Maintain the grass at heights between 2-1/2 inches and 3-1/2 inches and include a minimum of 2 mowings.

B. Water and protect all seeded areas until final acceptance of the lawn.

3.08 FINAL ACCEPTANCE

A. Final acceptance of seeded areas will be granted when a uniform stand of acceptable grass is obtained, with a minimum of 95 percent coverage. Portions of the seeded areas may be accepted at various times at the discretion of the Director's Representative.

B. Unacceptable seeded areas, dry application: Reseed as specified and fertilized at one-half the specified rate.

C. Once accepted, the State will assume all maintenance responsibilities.

END OF SECTION

SECTION 311000

SITE CLEARING

PART 1 GENERAL

1.01 REGULATORY REQUIREMENTS

A. Herbicides: Comply with the rules and regulations of the Department of Environmental Conservation Title 6, Chapter 4 Quality Services, Parts 320 through 329.

PART 2 PRODUCTS

2.01 MATERIALS

A. Tree Pruning Compound: Waterproof, antiseptic, elastic, and free of kerosene, coal tar, creosote, and other substances harmful to plants.

B. Herbicides: A chemical or a combination of chemicals which, according to the manufacturer's label, will kill stumps and roots. Deliver herbicides to the site in original manufacturers containers indicating type and percentage of chemical, and application instructions.

PART 3 EXECUTION

3.01 PREPARATION

A. Protection

1. Prevent damage to buildings, pavement, pipes, conduits, poles and other structures above and below ground that are adjoining or included in the contract area. Repair damage resulting from the contractor's negligence.
2. Protect existing trees and shrubs not to be removed. Cut back to point of branching all broken branches and skinned areas. Treat exposed wood with tree pruning compound.
3. Store materials and equipment in cleared areas away from tree roots. Prevent employees and equipment from trampling over woodland, existing planting, and established lawns.

3.02 TREE REMOVAL AND RECYCLING

A. It is the Director's intent that trees to be removed as part of this project be recycled in one of the following ways:
1. Sold to a mill for lumber production
2. Sold to a mill for paper product production
3. Harvested for fire wood production
4. Other Director's Representative approved option

B. Prior to removal, provide Director's Representative with written certification from receiving facilities where timber is to be recycled. Certification shall identify proposed product use. Receiving facilities shall provide copies of material receipts and quantities to the Director's Representative.

3.03 PRUNING

A. Prune trees where indicated of undesirable wood with the resulting crown shaped to the natural habit of the tree. Remove all diseased and dead branches, and branches interfering with healthy growth. Scar trace bark wounds as directed. All cuts shall be cleanly made with sharp tools, flush with the parent trunk or limb. Paint cuts over 3 inches in diameter with tree pruning compound.

3.04 CLEAN UP

A. Remove and dispose of all logs, tree trimmings, and debris from property. Leave Work area in a neat, uncluttered condition.

END OF SECTION

SECTION 312316
ROCK REMOVAL

PART 1 - GENERAL

1.01 RELATED WORK SPECIFIED ELSEWHERE

A. Earthwork: Section 310000.

1.02 REFERENCES

A. Comply with the applicable requirements of the Code of Federal Regulations Title 29 - Labor, Part 1926 Safety and Health Regulations for Construction (OSHA).

1.03 DEFINITIONS:

A. Rock: Limestone, sandstone, shale, granite, and similar material in solid beds or masses in its original or stratified position which can be removed only by blasting operations, drilling, wedging, or use of pneumatic tools, and boulders with a volume greater than 1.0 cu yd. Concrete building foundations and concrete slabs, not indicated, with a volume greater than 1.0 cu yd shall be classified as rock.
   1. Limestone, sandstone, shale, granite, and similar material in a broken or weathered condition which can be removed with an excavator or backhoe equipped with a bucket with ripping teeth or any other style bucket shall be classified as earth excavation.
   2. Masonry building foundations, whether indicated or not, shall be classified as earth excavation.

B. Unauthorized Rock Removal:
   1. The removal of any rock prior to performing the measurements/work required to determine quantities (Paragraph 3.01 B).
   2. The removal of material below required elevation indicated on the Drawings or beyond lateral dimensions indicated or specified without specific written direction by the Director.

C. General Rock Removal: Quantities of rock removal will be paid for as General Rock Removal when:
   1. The width of rock removed, as per measurement limits, is greater than or equal to the total excavation depth required.
   2. Boulders removed have a volume greater than 1.0 cu yd.

D. Trench and Pier Rock Removal: Quantities of rock removal will be paid for as Trench and Pier Rock Removal when the width of rock removed, as per measurement limits, is less than the total excavation depth required.

1.04 SUBMITTALS

A. Rock Removal Procedure: Submit a detailed outline of intended rock removal procedure for the Director's information. This submittal will not relieve the Contractor of responsibility for the successful performance of method used.

1. Where blasting is permitted, show drill hole pattern, method of blasting, explosive types, and amount of explosive load.

B. Quality Control Submittals:
   1. Certificates: Competency affidavit required under Quality Assurance Article.
   2. Blasters Qualifications Data: Submit the following for each blaster:
      a. Name, and employer's name, business address and telephone number.
      b. Names and addresses of the required number of similar projects which meet the experience criteria.

C. Measurement data for quantities of rock removal.

1.05 QUALITY ASSURANCE

A. Blasters' Qualifications: The persons performing the blasting operations shall be personally experienced in the handling and use of explosives, shall furnish satisfactory evidence of competency in performing in a safe manner the type of blasting required, and shall have performed blasting operations on 5 similar projects.

B. Regulatory Requirements: Obtain the proper Permit to Blast from authorities having jurisdiction before explosives are bought to the site.

C. Certifications: Affidavit, for each blaster, certifying that blaster is competent in performing the type of blasting required.

D. Pre-Rock Removal Conference: Before the rock removal work is scheduled to commence, a conference will be called by the Director's Representative at the site for the purpose of reviewing the Contract Documents and discussing requirements for the Work. The conference shall be attended by the Contractor's Representative and the person supervising the rock removal operations.

1.06 PROJECT CONDITIONS

A. Blasting:
   1. Do not perform blasting operations within 10 feet of existing buildings or structures, except as otherwise indicated.
   2. Limit peak particle velocity from blasts to a maximum of 2 inches per second at adjacent structures.
   3. When blasting operations will interfere with the work of related contracts (if any), schedule blasts during break and lunch periods or other non-work hours.
   4. Keep proper daily records, including drilling logs.

PART 2 PRODUCTS

2.01 MATERIALS:

A. Backfill Materials and Other Related Earthwork: As specified in Section 310000.

2.02 EQUIPMENT

A. Furnish one seismograph, with manufacturer's operating instructions, to measure particle velocity during blasting operations. The seismograph shall be capable of making a permanent record of blasting operations. The seismograph shall remain the property of the Contractor.

1. Deliver permanent records of blasting operations to the Director's Representative. Records will become the property of the State.

PART 3 - EXECUTION

3.01 EXAMINATION, Verification and Measurement

A. Examination of Existing Property and Construction: Prior to starting rock removal Work, thoroughly examine the existing property and construction at the site and record, with notes and drawings or other documentation, existing defects and deterioration. Make this information available to the Director's Representative upon request.

B. Prior to removing material classified as rock, excavate test pits down to rock for the purpose of verifying the presence of sound rock and determining top of rock elevations:

1. Verification of Sound Rock: Demonstrate to the Director’s Representative that materials to be classified as rock cannot be removed utilizing a backhoe or excavator equipped with any form of bucket, including a bucket equipped with ripping teeth.
2. Required Measurements: Take elevations and measurements as required for the purpose of determining the quantities of rock removal. Record all measurement data and submit a copy of the data to the Director's Representative. Backfill test pits prior to rock removal as directed. Unless otherwise indicated or directed, excavate test pits as follows:
   a. For Structures: One pit for each structure or one pit for each 1000 sq ft, whichever is greater.
   b. For Paved Areas: 3 pits for each 2500 sq ft.
   c. For Utility Lines: One pit for each 100 lin ft.

3.02 SITE PREPARATION

A. Schedule a site meeting with the Director’s Representative and facility personnel to review the rock removal procedures in detail.

B. If required, have seismographs in place and operational as well as all safety equipment and/or fencing.

3.03 ROCK REMOVAL

A. Remove rock as required by the Contract Drawings and as necessary for the installation of the Work. Make sufficient clearance, within the limits specified, for the proper execution of the Work.

B. Volume Determination: Top of Rock Elevations established prior to the performance of any rock removal (Section 3.01 B) will be used to determine the depth of rock removed. Measurements for the base and width of the rock excavation shall be taken of the actual rock cut, as required for the Work, or to the specified measurement limits, whichever is smaller. Unless otherwise directed in writing, measurement limits for this work shall be as follows:

1. Cast-In-Place Concrete:
   a. Vertical Limit: Bottom of rock cut for cast-in-place concrete bearing on rock shall be the bottom of concrete elevation indicated on the Drawings.
   b. Horizontal Limit: Limit measurement between vertical side surfaces at bottom of rock cut to the following:

Actual Depth of Rock Cut	**Distance Beyond Edge of Concrete in Each Direction**
Under 3 Feet	18 Inches
3 to 15 Feet	24 Inches
Over 15 Feet	30 Inches

2. Precast Concrete Structures: Measurement will be based on the size of the precast concrete structure specified or indicated on the Contract Drawings.
   a. Vertical Limit: Bottom of rock cut for precast concrete structure shall be 12 inches below the required bottom of structure elevation.
   b. Horizontal Limit: Limit measurement between vertical side surfaces at bottom of rock cut to the following:

Actual Depth of Rock Cut	**Distance Beyond Edge of Concrete in Each Direction**
Under 5 Feet	12 Inches
5 to 15 Feet	18 Inches
Over 15 Feet	24 Inches

3. Pipe:
   a. Vertical Limit: Bottom of rock cut for pipe in trench shall be 6 inches below the required pipe invert elevation, with depth measured from the mean surface of the rock.
   b. Horizontal Limit: Limit measurement between vertical side surfaces at bottom of rock cut to the following:

Actual Depth of Rock Cut	Trench Width
Under 10 Feet	24 Inches plus Pipe OD
10 to 15 Feet	36 Inches plus Pipe OD
Over 15 Feet	48 Inches plus Pipe OD

4. Conduit:
   a. Vertical Limit: Bottom of rock cut for conduit in trench shall be as required for the indicated depth of the conduit.
   b. Horizontal Limit: Limit measurement between vertical side surfaces at bottom of rock cut to the following:

Actual Depth of Rock Cut	Trench Width
Under 3 Feet	24 Inches, except where wider width is required by the multiple horizontal conduits.
3 to 10 Feet	36 Inches, except where wider width is required by the Drawings or directed for multiple horizontal conduits.

5. Poles for Overhead Electrical Service:
   a. Vertical Limit: Bottom of rock cut for poles shall be as required for the indicated depth of the pole.
   b. Horizontal Limit: Limit measurement between vertical side surfaces at bottom of rock cut to OD of pole butt plus 6 inches.

6. Foundation Drains: Where drains and foundation share the same rock cut, the horizontal measurement limit, on the drain side of the footing, shall be 30 inches from edge of concrete to vertical side surface of rock at bottom of cut unless otherwise shown on the Contract Drawings.

3.04 FIELD QUALITY CONTROL:

A. Provide the Director's Representative with the recorded top of rock elevations. Prior to the performance of any rock removal operations obtain, in writing, that the Director's Representative as reviewed the information and is in agreement with the measurements taken.

B. Notify the Director's Representative at least 3 work days in advance of all phases of blasting operations.

C. Allow time for visual inspection of bottom of rock cut required for the Work.

3.05 DISPOSAL OF EXCESS AND UNSUITABLE MATERIALS

A. Transport excess and unsuitable rock materials to spoil areas on State property designated by the Director's Representative, and dispose of such materials as directed.

3.06 ADJUSTING

A. Unauthorized Rock Removal:

1. Horizontal Direction: Backfill and compact unauthorized rock removal in the horizontal direction as specified for authorized excavation of the same classification, unless otherwise directed.
2. Vertical Direction: Immediately report unauthorized rock removal in the vertical direction to the Director's Representative. Correct unauthorized rock removal in the vertical direction in accordance with directions of the Director.

3.07 CLEANING

A. Where footings and walls will rest entirely on rock, clean rock surfaces free of soil and loose rock.

END OF SECTION

SECTION 31 10 00
SOIL MATERIALS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Subsoil Materials.

B. Topsoil Materials.

1.02 RELATED SECTIONS

A. Section 31 2200 – Earthwork and Site Grading

B. Section 32 9218 – Landscape Grading

1.03 REFERENCES

A. ASTM D2487 - Classification of Soils for Engineering Purposes.

B. NYSDOT Standard Specifications (latest edition), Section 203 - Excavation and Embankment.

1.04 SUBMITTALS FOR REVIEW

A. Submit gradation and mechanical analysis of soil materials to Director's Representative for approval.

B. Materials Source: Submit name and location of imported materials source to Director's Representative.

1.05 QUALITY ASSURANCE

A. Perform Work in accordance with all applicable standards.

B. Contractor must provide a qualified arborist to supervise work on site when trenching, removals, etc.

PART 2 PRODUCTS

2.01 SUBSOIL MATERIALS

A. Excavated and re-used native material.

B. Free of clay, rock or gravel larger than 2 inches in any dimension, debris, waste, frozen materials, vegetation and other deleterious matter.

C. Satisfactory soil materials are defined as those complying with ASTM D2487, soil classification groups GW, GP, GM, SM, SW, and SP.

2.02 TOPSOIL MATERIALS

A. Imported borrow as required to meet project requirements.

B. Topsoil shall be fertile, friable, natural loam, surface soil, free of subsoil, clay lumps, brush, weeds, and other litter, and free of roots, stumps, stones larger than 1/2" in any dimension, and other extraneous or toxic material harmful to plant growth. Topsoil shall not be used in a frozen or muddy condition.

C. Topsoil shall have an acidity range of pH 5.5 to 7.5 and shall contain not less than 6% or more than 12% organic matter as determined by loss on ignition of moisture-free samples dried at 100 degrees Centigrade.

D. Topsoil shall meet the following mechanical analysis:

Sieve	% passing
1/2" screen	100
#100 mesh	40-60
#200 mesh	40-50

C. Conforming to ASTM D2487 Soil classification groups Symbol OH and PT.

2.03 SOURCE QUALITY CONTROL

A. Subsoil and Topsoil material shall consist of any suitable material complying with the specifications contained herein.

B. If testing and analysis indicate materials do not meet specified requirements, change material and retest.

C. Provide materials of each type from same source throughout the Work.

PART 3 EXECUTION

3.01 SOIL REMOVAL

A. Remove turf under areas to be re-graded and sodded as shown on the plans. Remove from site.

B. Cut and fill subsoil in the areas shown on the grading plan.

3.02 STOCKPILING

A. Temporarily stockpile excavated material to be reused on site where indicated by the Director's Representative.

B. Stockpile excavated material to be reused in sufficient quantities to meet Project schedule and requirements.

C. Separate differing materials with dividers or stockpile apart to prevent mixing.

D. Prevent intermixing of soil types or contamination.

E. Direct surface water away from stockpile site to prevent erosion or deterioration of materials.

F. Stock piles may not be placed within drip lines of trees nor of such a height to degrade the soil.

3.03 STOCKPILE CLEANUP

A. Remove stockpile, leave area in a clean and neat condition. Grade site surface to prevent free standing surface water.

END OF SECTION

SECTION 31 1100
AGGREGATE MATERIALS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Aggregate subbase material for concrete pavement, and stone dust pathways.

B. Drainage stone for retaining walls.

C. Stabilization and Filtration Geotextiles.

D. Boulders.

1.02 RELATED SECTIONS

A. Section 31 2200 – Earthwork and Site Grading.

1.03 REFERENCES

A. NYSDOT Standard Specifications (latest edition), Section 300 - Bases and Subbases, Section 703 - Aggregates.

B. AASHTO - M147 - Materials for Aggregate and Soil-Aggregate.

C. ASTM C136 - Method for Sieve Analysis of Fine and Coarse Aggregates.

D. ASTM D2487 - Classification of Soils for Engineering Purposes

1.04 SUBMITTALS FOR REVIEW

A. Submit gradation and material analysis for ALL types of aggregate materials to Director's Representative, for approval prior to ordering or delivering to site.

B. Materials Source: Submit name of imported materials suppliers to Director's Representative.

1.05 QUALITY ASSURANCE

A. Perform work in accordance with applicable state and local standards.

PART 2 PRODUCTS

2.01 COARSE AGGREGATE MATERIALS

A. Aggregate subbase material for asphalt and concrete pavements and granite curbing bedding: Properly graded, non-frost susceptible, crushed stone mixture, NYSDOT type 2, item 304.12 and conforming to the following gradation requirements:

Sieve Size	Percent Passing
2"	100
1/4"	30-65
#40	5-40
#200	0-10

B. Drainage Stone for utility pipe bedding and initial backfill, bio-retention drainage stone, artificial turf and geocell surface: Properly graded, non-frost susceptible crushed stone mixture, NYSDOT #1 and #2 crushed stone mix conforming to NYSDOT 703-02 Requirements.

C. Boulders: Consisting of at least 50% native stone from on site and 50% imported to the site of the same native stone pertaining to the area. Boulder dimensions shall be at least 2 feet in height and 2 feet by 2 feet in length. At least one side shall be flat to be used as the base.

2.02 FILTRATION GEOTEXTILE

A. Filtration Geotextile: Non-biodegradable, high modulus woven polypropylene fabric that is inert to naturally encountered chemicals, alkalies and acids. Fabric shall be Mirafi 160N, or approved equal.

2.03 STABILIZATION GEOTEXTILE

A. Stabilization Geotextile: Non-biodegradable, high modulus woven polypropylene fabric that is inert to naturally encountered chemicals, alkalies and acids. Fabric shall be Mirafi 500X, or approved equal.

2.04 SOURCE QUALITY CONTROL

A. Perform testing and analysis of aggregate materials in accordance with ASTM C136.

B. If tests indicate materials do not meet specified requirements, change material or material source and retest.

C. Provide materials of each type from same source throughout the work.

PART 3 EXECUTION

3.01 STOCKPILING

A. Stockpile materials on site as needed at locations designated by the Director's Representative.

B. Stockpile in sufficient quantities to meet Project schedule and requirements.

C. Separate differing materials with dividers or stockpile apart to prevent mixing.

D. Direct surface water away from stockpile site so as to prevent erosion or deterioration of materials.

3.02 STOCKPILE CLEANUP

A. Prevent free standing surface water.

END OF SECTION

SECTION 31 20 00

SITE DEMOLITION AND REMOVALS

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Removal and disposal of miscellaneous surface items including stump removal.

B. Remove turf from lawn areas as shown on plans and clear and grub vegetation as shown.

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1.02 RELATED WORK

A. Examine contract documents for requirements that affect work of this section. Other sections that directly relate to work of this section include:

1. Section 31 2200 Earthwork and Site Grading.
2. Section 31 2501 Erosion and Sediment Control.

1.03 JOB CONDITIONS

A. Traffic: Conduct demolition operations to ensure minimum interference with walks and streets and other adjacent properties. Do not close or obstruct streets without permission from authorities having jurisdiction.

1.04 DISPOSAL OF WASTE MATERIALS

A. The Contractor shall remove from the site and dispose of all waste materials in a safe and legal manner.

1.05 PROTECTION OF EXISTING VEGETATION TO REMAIN

A. Protect existing trees and other vegetation indicated to remain in place, against unnecessary cutting, breaking or skinning of roots and skinning and bruising of bark. Do not stockpile construction materials or excavated materials within drip line of trees. Avoid excess foot or vehicular traffic and parking of vehicles within drip line.

B. Provide protection for roots over 1 1/2" diameter cut during construction operations. Coat the cut faces with an emulsified asphalt, or other acceptable coating, formulated for use on damaged plant tissues. Temporarily cover exposed roots with wet burlap to prevent roots from drying out, cover with earth as soon as possible.

C. Repair or replace trees and vegetation damaged by construction operations intended to remain, in a manner acceptable to the Director’s Representative. Repair tree damage by a qualified Arborculturist.

PART 2 PRODUCTS

2.01 NOT APPLICABLE.

PART 3 EXECUTION

3.01 PREPARATION

A. Protect bench marks and survey control points from damage or displacement.

3.02 UTILITIES

A. Utilities on and adjacent to the site in the area of demolition, whether underground or overhead, shall be protected as required to accomplish new work all in coordination and in conformance with the utility Owner. Coordinate all necessary clearing and removals. The Contractor is responsible for verifying the location of all existing underground utilities.

3.03 PROTECTION OF EXISTING WORK

A. Protect and be responsible for all existing facilities within the area of operations. Any disturbance or damage to adjacent or existing work and facilities resulting directly from this operation shall be promptly restored, repaired or replaced to the satisfaction of the Director's Representative at no additional cost.

3.04 REMOVALS

A. Remove all items indicated to be demolished and dispose from the site in a legal manner.

B. Chainsaw use is only to occur during the month of November due to the nesting Bald Eagles.

3.05 POLLUTION CONTROLS

A. Use water sprinkling or other suitable methods to limit dust and dirt rising and scattering in the air to the lowest practical level. Comply with governing regulations pertaining to environmental protection.

B. Clean adjacent roads, structures and improvements of dirt, dust and debris caused by work of this section and as directed by the Director's Representative.

END OF SECTION

SECTION 31 2200
EARTHWORK AND SITE GRADING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Strip, store, and spread existing topsoil.

B. Cutting, filling, grading, and compaction of subgrade soils.

1.02 RELATED SECTIONS

A. Section 32 9218 – Landscape Grading.

B. Section 32 9219 – Seeding.

C. Section 31 2501 – Erosion and Sediment Control.

1.03 REFERENCES

A. ASTM C136 - Method for Sieve Analysis of Fine and Coarse Aggregates.

B. ASTM D1556 - Test Method for Density of Soil in Place by the Sand-Cone Method.

C. ASTM D1557 - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures (modified proctor).

D. ASTM D2167 - Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method.

E. ASTM D2922 - Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).

F. ASTM 699 - Laboratory Testing.

G. NYSDOT Standard Specifications (latest edition) section 203-3.12 compaction.

1.04 SUBMITTALS

A. Test Reports: Submit the following reports directly to the Director's Representative from the testing service, with copy to the Contractor:

1. Test reports on borrow material including gradation and mechanical analysis.
2. Verification of the subgrade suitability material to meet specified requirements.
3. At least one optimum moisture-maximum density curve for each type of soil to be used or encountered.
4. Field reports including in-place density tests.
5. Report of actual unconfined compressive strength and/or results of bearing tests of each strata tested.

B. Project Record Documents: Accurately record actual locations of utilities remaining by horizontal dimensions, elevations or inverts, and slope gradients.

1.05 QUALITY ASSURANCE

A. Perform earthwork and site grading in conformance with applicable requirements of governing authorities having jurisdiction.

B. Testing and Inspection Service: Contractor shall employ and pay for a qualified independent geotechnical testing and inspection service/laboratory to perform soil testing and inspection service during earthwork operations.

C. Testing Laboratory Qualifications: To qualify for acceptance, the geotechnical testing and

inspection service/ laboratory must demonstrate to Director's Representative satisfaction, based on evaluation of laboratory-submitted criteria conforming to ASTM E 699, that it has the experience and capability to conduct required field and laboratory geotechnical testing without delaying the progress of the work.

1.06 EXISTING UTILITIES

A. Locate existing underground and overhead utilities in the area of work before starting earthwork operations. It is the Contractor's responsibility to utilize a locating service to mark the location of all underground utilities in the project area.

B. Where utilities are to remain in place, provide adequate means of protection and precaution against damage throughout the contract period. Conform to the requirements of the utility having jurisdiction.

C. Should uncharted, or incorrectly charted underground or other utilities be encountered during earthwork operations, consult the utility Owner immediately for directions.

D. Cooperate with the Owner and public and/or private utility companies in keeping their respective services and facilities in operation. Do not interrupt existing utilities serving facilities occupied and used, except when permitted in writing by the Director's Representative, and then only after acceptable temporary utility services have been provided. Provide minimum of 48 hours notice to Director's Representative.

E. Repair all damaged utilities to the satisfaction of the utility Owner at the Contractor's expense.

F. Remove, plug or cap inactive or abandoned utilities encountered during construction operations. The location of such utilities shall be noted on the record drawings. Verify "inactivity" of services with involved jurisdiction before start of work.

G. Use of explosives is not permitted.

PART 2 PRODUCTS

2.01 MATERIALS

A. Topsoil: As specified in Section 31 1000.

B. Subsoil: As specified in Section 31 1000.

C. Aggregate Materials: As specified in Section 31 1100.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify site conditions prior to commencement of work.

B. Verify that survey benchmark and intended elevations for the Work are as indicated.

3.02 PREPARATION

A. Identify required lines, levels, contours, and datum.

B. Stake and flag locations of known utilities.

C. Protect plant life, lawns, and other features remaining as a portion of final landscaping.

D. Protect all benchmarks, survey control points, existing structures, fences, sidewalks, paving, and curbs against damage.

E. Strip topsoil to an approximate depth of 4" and stockpile where designated by Director's Representative.

3.03 SUBSOIL EXCAVATION

A. Excavation is unclassified, and includes excavation to subgrade elevations indicated, regardless of the character of materials and obstructions encountered.

B. If unsuitable materials (as determined by geotechnical testing service/laboratory) are encountered at the required subgrade elevations, carry excavations deeper and replace the excavated material as directed by the geotechnical testing service/laboratory. Promptly remove unsuitable material from the site.

C. Prevent surface and subsurface water from flowing into excavations. Dewater as required. Contractor is responsible for all dewatering operations, and the disposal of the water shall be in accordance with all applicable local, state and federal regulations and as indicated on the plans.

D. Establish and maintain temporary drainage ditches and other diversions outside excavation limits to convey rainwater and water removed from excavations to runoff areas.

E. Do not excavate wet subsoil.

F. Stockpile in area designated on site by the Director's Representative to depth not exceeding 8 feet and protect from erosion.

G. Stability: Replace damaged or displaced subsoil to same requirements as for specified fill.

H. Conform to elevations and dimensions within a tolerance of +0.01 feet/-0.10 feet.

3.04 FILLING

A. Remove vegetation, organic material, debris, unsuitable soils, obstructions and deleterious materials from ground surface prior to placement of fills. Break-up sloped surfaces steeper than 4:1 so that fill material will bond with existing surface.

B. When existing ground surface has a density less than that specified for the particular area classification, break-up the ground surface, pulverize, moisture-condition to the optimum moisture content, and compact to the required depth and percentage of maximum density.

C. Fill areas to contours and elevations with unfrozen materials.

D. Place fill material on continuous layers, not exceeding 8 inches in loose depth for material to be compacted by heavy compaction equipment and not more than 4" in loose depth for material to be compacted by hand-operated equipment, and compact.

E. Maintain optimum moisture content of fill materials to attain required compaction density.

F. Make grade changes gradual. Blend slope into level areas.

3.05 GRADING

A. Uniformly grade areas within the limits shown on the plans. Smooth finish surfaces within specified tolerances. The degree of finish required will be that ordinarily obtainable from either blade grader or scraper operations.

B. Shape the surface to line, grade and cross-section as shown on the plans, with the finish surface not more than 0.10 foot above or below required subgrade elevation, compacted as specified, and graded to prevent ponding of water after rains. Include such operations as plowing, discing and any moisture or aerating required to provide the optimum moisture content for compaction. Fill low areas resulting from removal of unsatisfactory soil materials, obstructions, and other deleterious materials using satisfactory soil material.

C. Before placing fill, proof roll subgrade thoroughly using a 10-ton roller with two passes, the second pass perpendicular to the first.

3.06 COMPACTION

A. Control soil compaction during construction, providing the minimum percentage of density specified for each area classification indicated below.

B. Compact soil to not less than the following percentages of maximum density in accordance with ASTM D 1557 Modified Proctor:

1. Planting and/or Lawn Areas: Compact top 6" of subgrade and each layer of fill material at 90% maximum density.

2. Pavements and Building Slab Areas: Compact top 12" of subgrade and each layer of fill area at 95% maximum density.

C. All subgrades shall be compacted with an approved method as specified in NYSDOT Standard Specification section 203-3.12.

D. Moisture Control:

1. Where the subgrade or layer of soil material must be moisture conditioned before compaction, uniformly apply water to the surface. Prevent free water appearing on the surface during or subsequent to compaction operations.

2. Remove and replace, or scarify and air dry, soil material that is too wet to permit compaction to specified density.

3. Soil material that has been removed because it is too wet to permit compaction may be stockpiled or spread to allow to dry. Assist drying by discing, harrowing, or pulverizing until the moisture content is reduced to a satisfactory value.

3.07 FIELD QUALITY CONTROL

A. Testing: Geotechnical testing service/laboratory retained by the Contractor shall inspect, test, and approve each in-place subgrade layer before further backfill work is performed. Testing service shall review and test material and determine optimum moisture at which maximum density can be obtained in accordance with ASTM D1557.

B. Perform field density test in accordance with ASTM D 1556 (sand cone method), ASTM D 2167 (rubber balloon method) or ASTM D 2922 (nuclear method).

C. If tests indicate work does not meet specified requirements, Contractor shall remove work, replace, and retest.

D. Frequency of Tests: In each compacted soil fill layer, make one field density test for each lift every 2,000 sq. ft. of fill area. In pipe trenches, make one field density test for each 100 lineal feet of trench.

3.08 MAINTENANCE

A. Protect newly graded areas from traffic and erosion. Keep free of trash and debris.

B. Repair and re-establish grades in settled, eroded and rutted areas to the specified tolerances. Where completed compacted areas are disturbed by subsequent construction operations or adverse weather, scarify the surface, reshape and compact to the required density prior to further construction.

3.09 SETTLING

Where settling is measurable or observable at graded areas during the general project warranty period, remove surface (pavement, lawn or other surface), add backfill material, compact and replace surface treatment. Restore appearance, quality and condition of

surface or finish to match adjacent work, and eliminate evidence of restoration to greatest extent possible.

END OF SECTION

SECTION 31 2501
EROSION AND SEDIMENT CONTROL

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Contractor shall install and maintain all erosion and sediment control facilities throughout the duration of the contract.

B. Contractor shall remove all erosion and sediment control facilities upon final stabilization of the project site.

1.02 RELATED SECTIONS

A. Section 31 2200: Earthwork and Site Grading

1.03 REFERENCES

A New York State Standards and Specifications for Erosion and Sediment Control, latest edition.

1.04 SUBMITTALS FOR REVIEW

A. Designate erosion control and maintenance activities on the submitted Project Schedule.

1.05 QUALITY ASSURANCE

All Erosion/Sediment Control activities performed by the contractor shall be in compliance with the following standards of practice:

A. New York State Standards and Specifications for Erosion and Sediment Control published by NYS Soil and Water Conservation Committee.

PART 2 - PRODUCTS

2.01 NOT APPLICABLE EXCEPT THE FOLLOWING

2.02 TEMPORARY GRASS

A. Temporary grass shall be quick growing species suitable to the area and as a temporary cover which will not compete with the grasses sown later for permanent cover.

B. Seed Mixtures

1. Temporary Seeding

	Type	Lbs./Acre	Lbs./1000SF
a.	Annual Rye grass	80	1.9
b.	Winter Ryegrass	100	2.5

Use winter rye if seeding in October/November.

2.03 EROSION CONTROL FABRIC FOR HILL STABILIZATION

PRODUCT:
Turf Reinforcement Mat (TRM): TMAX3K and anchor with stainless steel twist pins TL-TA1 as manufactured by North American Green, Western Green, 4609 E. Boonville-New Harmony Rd., Evansville, IN 47725, Website: www.nagreen.com, Phone: 1-800-772-2040, or approved equal.

2.04 TEMPORARY MULCHING MATERIAL

A. Mulching Material: Oat or wheat straw, free from weeds, foreign matter detrimental to

plant life, and dry. Hay or chopped cornstalks are not acceptable.

PART 3 - EXECUTION

3.01 EROSION AND SEDIMENT CONTROL

A. All erosion and sediment control facilities must be maintained in working order until the site is stabilized. All preventative and remedial maintenance work, including clean out, repair, replacement, re-grading, re-seeding, re-mulching, or re-netting, must be performed immediately.

B. Any disturbed area on which activity has ceased must be stabilized immediately. During non-germinating periods, mulch must be applied at the recommended rates. Spread uniformly to form a continuous blanket not less than 1" loose measurement over seeded areas. Apply tackifier to securely hold in place the mulch. Apply a minimum ratio of 75 lbs. tackifier/2,000lbs. of mulch.

C. After final stabilization has been achieved, temporary erosion and sediment controls must be removed. Areas disturbed during removal shall be stabilized immediately.

D. Sediment shall be removed from sediment fences whenever their capacity has been reduced by fifty (50) percent from the design capacity and/or as required to ensure intent. Prior to fine grading and restoration, the Contractor shall remove and dispose of accumulated sediments and silts as required.

3.02 POLLUTION CONTROL

A. Provide methods, means and facilities required to prevent contamination of soil, water or atmosphere by the discharge of noxious substances from construction operations. Promptly repair equipment leaks. Provide equipment and personnel to perform emergency measures required to contain any spillages, and to remove contaminated soils or liquids.

B. Notify Owner’s Representative if contaminated soil, groundwater or other forms of pollution are encountered. Excavate and dispose of any contaminated earth immediately in accordance with Federal, State and local regulations off-site, and replace with suitable compacted fill.

C. Pollutants such as fuels, lubricants, bitumen’s, raw sewage and other harmful materials shall not be discharged into or near rivers, streams, and impoundments or into natural or man-made channels leading thereto. Wash water or waste from concrete mixing operations or trucks shall not be allowed to enter live streams.

3.03 DEWATERING AND WASHWATERS

A. Water from aggregate washing, equipment washing, dewatering or other operations containing sediment, shall be treated by filtration, settling basin, silt bags or other means sufficient to reduce the turbidity, so as not to cause a substantial visible contrast to natural conditions.

3.04 CONSTRUCTION OPERATIONS

A. When borrow material is obtained from other than commercially operated sources, erosion of the borrow site shall be so controlled, both during and after completion of the work, so that erosion will be minimized and sediment will not enter streams or other bodies of water. Waste or disposal areas and construction roads shall be located and constructed in a manner that will minimize sediment-entering streams. Install sediment containment devices around stockpiles and waste areas. Stabilize the surface of temporary haul roads to minimize sediment creation.

3.05 FINAL STABILIZATION

A. Final stabilization is defined as all soil disturbing activities at the site have been completed, and that a uniform perennial vegetative cover with a density of at least 80% has been established or equivalent stabilization measures (such as the use of mulches or geotextiles) have been employed on all unpaved areas and areas not covered by permanent structures.

3.06 REMOVAL OF TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES

A. Remove erosion control devices when final stabilization has occurred for the respective areas of the site and are no longer needed.

3.07 CONTRACTOR'S RESPONSIBILITY

A. The actual scheduling and implementation of the erosion and sediment control plan and devices shown are considered to comprise the majority of efforts needed, but not necessarily all that will be required. Weather, Contractor's schedule, extent of disturbance, site and unforeseen conditions can dictate that greater efforts will be necessary.

END OF SECTION