# 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

C. Section 32 9219 – Sodding

### 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 11 00

# AGGREGATE MATERIALS

## PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Aggregate subbase material for concrete pavement, bluestone pavement, concrete unit pavers, and brick pavement.

B. Drainage stone.

C. Utility pipe bedding and backfill.

D. Stabilization and Filtration Geotextiles.

E. Cobblestones for the cobblestone/concrete gutter.

F. Stone Mulch.

G. Polymeric Sand Setting Bed.

### 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 sub-base material and trench backfill: 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. Utility pipe bedding stone, initial backfill and #2 drainage stone: Properly graded, non-frost susceptible crushed stone mixture, NYSDOT size designation 2, table 703-4

crushed stone conforming to NYSDOT 703-02 Requirements.

C. #1 Drainage Stone: Properly graded, non-frost susceptible crushed stone mix, NYSDOT size designation 1, table 703-4 and conforming to the following gradation requirements:

| Sieve Size | Percent Passing |
|---|---|
| 1” | 100 |
| 1/2” | 90-100 |
| 1/4” | 0-15 |
| #200 | 0-1.0 |

D. Stabilized Construction Entrance: Properly graded, non-frost susceptible crushed stone mix, NYSDOT size designation 4, table 703-4.

E. Cobblestones: Properly graded, non-frost susceptible rounded stones, approximately 3” in length, color and size to match existing cobblestone/concrete gutter.

F. Stone Mulch: 3” – 4” diameter, rounded, washed, river stone, decorative color: Brown

## 2.02 FINE AGGREGATE MATERIALS

A. Sand: Natural river or bank sand, free of silt, clay, loam, friable or soluble materials and organic matter; graded within the following limits:

| Sieve Size | Percent Passing |
|---|---|
| 3/8” | 100 |
| 1/4” | 90-100 |
| 1/8” | 75-100 |
| 1/16” | 50-85 |
| #50 mesh | 25-60 |
| #100 mesh | 10-30 |
| #200 mesh | 1-10 |

B. Polymeric Sand: SRW X-treme™ Polymeric Sand or equal. Wide-joint polymeric sand haze-free and rain safe in 20 minutes! Advanced technology makes polymers dry clear ensuring a haze-free project. Being the fastest wide-joint set up time it also helps with unforeseen weather. While still holding strong and lasting long to reduce washout weeds and insect infestations. Color: Granite.

## 2.03 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.

## 2.04 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.

## 2.05 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.

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

## 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, but not limited to: asphalt drive/parking lot, steel edging, brick walk, concrete walk, gravel pavement, holly tree, boxwood hedge, tower and base, light pole, concrete block wall, and all other debris/materials as shown on the plans and which is within the project area and adversely affects the installation and aesthetics of the new work.

B. Remove and salvage for reuse existing steel picket fence panels. Relocate cannon displays (3), Relocate security cameras.

C. Remove turf from lawn areas.

D. Remove and salvage bluestone sidewalks.

E. Remove shed and concrete slab.

F. Remove and replace water spigots.

### 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.
3. Section 31 2001 Temporary Tree and Plant Protection..

### 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.

### 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 20 01

# TEMPORARY TREE AND PLANT PROTECTION

## PART 1 - GENERAL

### 1.01 SECTION INCLUDES

A. General protection and pruning of existing trees and plants that are affected by execution of the Work, whether temporary or permanent construction.

B. Air excavation in Tree Protection Zone

### 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 20 00 Site Demolition and Removals.
2. Section 31 2501 Erosion and Sediment Control.

### 1.03 DISPOSAL OF WASTE MATERIALS

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

### 1.04 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.

### 1.05 DEFINITIONS

A. Caliper: Diameter of a trunk measured by a diameter tape at a height 6 inches above the ground for trees up to and including 4-inch size at this height and as measured at a height of 12 inches above the ground for trees larger than 4-inch size.

B. Tree-Protection: Individual tree guard surrounding single tree trunk delineating area not to be disturbed during construction and indicated on drawings.

C. Critical Root Protection Zone (CRZ): Area surrounding individual trees or groups of trees to be protected during construction, as indicated on Drawings and defined by the drip line of individual trees or the perimeter drip line of groups of trees unless otherwise indicated.

D. Diameter Breast Height (DBH): Diameter of a trunk as measured by a diameter tape at a height 54 inches above the ground line.

E. Drip line: Outermost circumference of a tree canopy or the outermost extents of the collective canopy of a group of trees.

F. Vegetation: Trees, shrubs, groundcovers, grass, and other plants.

### 1.06 PRE-INSTALLATION MEETING

A. Pre-installation Conference: Conduct conference at Project site. Review methods and procedures related to temporary tree and plant protection including, but not limited to, the following:

(a.) Tree-service firm's personnel and equipment needed to make progress and avoid delays.
(b.) Arborist's responsibilities.
(c.) Quality-control program.
(d.) Coordination of Work and equipment movement with the locations of protection zones.
(e.) Trenching by hand or with air spade within protection zones.
(f.) Field quality control.

## 1.07 SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: 1. Include plans, elevations, sections, and locations of protection-zone fencing and signage, showing relation of equipment-movement routes and material storage locations with protection zones. 2. Detail fabrication and assembly of protection-zone fencing and signage. 3. Indicate extent of trenching by hand or with air spade within protection zones.

C. Samples: For each type of the following: 1. Organic Mulch: 1-quart volume of organic mulch; in sealed plastic bags labeled with composition of materials by percentage of weight and source of mulch.

D. Arborist Report: Written report prepared by Certified Project Arborist for care and protection of trees affected by construction during and after completing the Work. A preliminary report has been prepared by the Consultant Arborist and appended to the Project Manual. 1. Report shall include Tree Pruning Schedule with dates for such work. The written pruning schedule shall detail scope and extent of pruning for all trees to remain that interfere with or are affected by construction. Report shall include: (a.) Species and size of tree. (b.) Location on site plan. Include unique number identifier for each as shown in Contract Documents. (c.) Reason for pruning. (d.) Description of pruning to be performed. (e.) Timing of pruning to be performed. (f.) Description of maintenance by tree service firm following pruning.

E. Qualification Data: For arborist and tree service firm.

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

G. Existing Conditions: Documentation of existing trees and plantings indicated to remain, which establishes preconstruction conditions that might be misconstrued as damage caused by construction activities. 1. Use sufficiently detailed photographs or video recordings. 2. Include plans and notations to indicate specific wounds and damage conditions of each tree or other plants designated to remain. 3. Identify any pests or disease on trees or other plants to remain that should be addressed in maintenance recommendations.

## 1.08 QUALITY ASSURANCE

A. Arborist Qualifications: Certified Arborist as certified by ISA.

B. Tree Service Firm Qualifications: An experienced tree service firm that has successfully completed temporary tree and plant protection work similar to that required for this Project and that will assign an experienced, qualified arborist to Project site during execution of the Work. Tree service firm shall have experience working in landscapes and plaza areas with tight conformance to grade conditions.

C. Quality-Control Program: Prepare a written program to systematically demonstrate the ability of personnel to properly follow procedures and handle materials and equipment

during the Work without damaging trees and plantings. Include dimensioned diagrams for placement of protection zone fencing, the arborist's and tree-service firm's responsibilities, instructions given to workers on the use and care of protection zones, and enforcement of requirements for protection zones.

### 1.09 FIELD CONDITIONS

A. The following practices are prohibited within protection zones:

1. Storage of construction materials, debris, or excavated material.
2. Moving or parking vehicles or equipment.
3. Foot traffic.
4. Erection of sheds or structures.
5. Impoundment of water.
6. Excavation or other digging unless otherwise indicated.
7. Attachment of signs to or wrapping materials around trees or plants unless otherwise indicated.

B. Do not direct vehicle or equipment exhaust toward protection zones.

C. Prohibit heat sources, flames, ignition sources, and smoking within or near protection zones and organic mulch.

## PART 2 PRODUCTS

**2.01** Backfill Soil: Planting soil of suitable moisture content and granular texture for placing around tree; free of stones, roots, plants, sod, clods, clay lumps, pockets of coarse sand, concrete slurry, concrete layers or chunks, cement, plaster, building debris, and other extraneous materials harmful to plant growth.

**2.02** Tree Guard (Type 1): Fencing constructed of two 2-by-4-inch horizontal top rail, with 4-by-4- inch preservative-treated wood posts spaced not more than 60 inches apart, and lower 6x6 bottom rail set at existing grade. Plastic barrier fabric (color: orange) to be used as infill between posts and rails. Secure each tree guard to ground with 24” length #4 rebar stakes.

(a.) Height: 48 inches.

**2.03**. Critical Root Zone Protection (Type 2): Fencing fixed in position and meeting the following requirements: Fencing constructed of 1 ¾” x 1” 13 GA U Channel steel posts. Plastic barrier fabric (color: orange) to be used as infill between posts.

(a.) Height: 48 inches.

Tree Wrap: Provide paper tree wrap in light color for all protected trees (the use black tree wrap is prohibited).

## PART 3 EXECUTION

### 3.01 EXAMINATION

A. Erosion and Sedimentation Control: Examine the site to verify that temporary erosion- and sedimentation-control measures are in place. Verify that flows of water redirected from construction areas or generated by construction activity do not enter or cross protection zones.

B. Prepare written report, endorsed by arborist, listing conditions detrimental to tree and plant protection.

### 3.02 PREPARATION

A. Locate and clearly identify trees, shrubs, and other vegetation to remain or to be relocated. Tie a 1- inch blue vinyl tape around each tree trunk at 54 inches above the ground.

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

C. Critical Root Zone Protection: Mulch areas inside critical root zone protection areas and other areas indicated. Do not exceed indicated thickness of mulch. 1. Apply 4-inch uniform thickness of organic mulch as directed by the Consultant Arborist. Do not place mulch within 6 inches of tree trunks.

**3.03 PROTECTION ZONES**

A. Protection-Zone Fencing: Install protection-zone fencing along edges of protection zones before materials or equipment are brought on the site and construction operations begin in a manner that will prevent people from easily entering protected areas except by entrance gates. Construct fencing so as not to obstruct safe passage or visibility at vehicle intersections where fencing is located adjacent to pedestrian walkways or in close proximity to street intersections, drives, or other vehicular circulation.

B. Critical Root Zone (CRZ) Protection Fencing: Set or drive posts into ground to a minimum three (3) foot depth without concrete footings. Where a post is located on existing paving or concrete to remain, provide appropriate means of post support acceptable to Director's Representative.

C Straw/hay Bale Placement: Place bales within 12" of outside of CRZ fencing where the outside edge of a construction access route (as shown on MPT Plans) is within five (5) feet of the edge of the CRZ Protection Fencing. Place bales in a continuous line, six (6) feet on center or as approved by Director's Representative. Stake straw/hay bales as required to restrict movement by vehicular disturbance or by hand during construction. Straw/hay bales shall be maintained during the life of the project as a viable buffer and replaced as needed.

1. Tree Protection: Install guards under direct supervision of arborist.

2. Maintain protection zones free of weeds and trash.

3. Maintain all protection zone fencing in good condition as acceptable to Director's Representative and remove when construction operations are complete and equipment has been removed from the site.

4. Do not remove Tree Protection Fencing, even temporarily, to allow deliveries or equipment access through the protection zone.

5. Temporary access for activities such as hand removal of steel edging is permitted within the critical root zone protection area, subject to preapproval in writing by arborist if a root buffer effective against soil compaction is constructed as directed by arborist. Maintain root buffer so long as access is permitted.

**3.04 EXCAVATION**

A. General: Excavate at edge of protection zones and for trenches indicated within protection zone

B. Trenching within Protection Zones: Where utility trenches are required within protection zones, excavate under or around tree roots by hand or with air spade, or tunnel under the roots by drilling, auger boring, or pipe jacking. Do not cut main lateral tree roots or taproots; cut only smaller roots that interfere with installation of utilities. Cut roots as required for root pruning. If excavating by hand, use narrow-tine spading forks to comb soil and expose roots.

C. Redirect roots in backfill areas where possible. If encountering large, main lateral roots, expose roots beyond excavation limits as required to bend and redirect them without breaking. If encountered immediately adjacent to location of new construction and redirection is not practical, cut roots approximately 3 inches back from new construction and as required for root pruning.

D. Do not allow exposed roots to dry out before placing permanent backfill. Provide temporary earth cover or pack with peat moss and wrap with burlap. Water and maintain in a moist condition. Temporarily support and protect roots from damage until they are permanently relocated and covered with soil.

**3.05 SOIL DECOMPACTION AT EXISTING TREES**

A. Contractor shall follow direction on decompaction procedures within critical root zones of existing trees as described in Arborist's written report.

**3.06 WATERING**

A. Regular tree watering must be initiated and maintained during the growing seasons (approximately March 30-Thanksgiving) throughout the construction period. Soils must be wet to 24-36 inches depth and must be maintained at between field capacity and one-half field capacity. This will typically mean watering with a deep watering of each tree once per week. The consulting arborist may periodically monitor watering; using a tensiometer to establish that sufficient water is available to trees. In the event of a drought, the frequency of watering may be increased to twice per week.

**3.07 ROOT PRUNING**

A. Root pruning shall only be done at the direction of the Arborist. Prune tree roots that are affected by temporary and permanent construction. Prune roots as follows, unless arborist has provided instructions specific to the trees at this location:

1. Cut roots manually by digging a trench and cutting exposed roots with sharp pruning instruments; do not break, tear, chop, or slant the cuts. Do not use a backhoe or other equipment that rips, tears, or pulls roots.

2. Cut Ends: Coat cut ends of roots more than 1-1/2 inches in diameter with an emulsified asphalt or other coating formulated for use on damaged plant tissues and that is acceptable to arborist.

3. Temporarily support and protect roots from damage until they are permanently redirected and covered with soil.

4. Cover exposed roots with burlap and water regularly.

B. Root Pruning at Edge of Protection Zone: Prune tree roots 12 inches outside of the protection zone by cleanly cutting all roots to the depth of the required excavation.

C. Root Pruning within Protection Zone: Clear and excavate by hand or with air spade to the depth of the required excavation to minimize damage to tree root systems. If excavating by hand, use narrow-tine spading forks to comb soil to expose roots. Cleanly cut roots as close to excavation as possible.

**3.08 CROWN PRUNING**

A. Crown pruning shall only be done at the direction of the Arborist. Prune branches that are affected by temporary and permanent construction.

1. Prune to remove only injured, broken, dying, or dead branches unless otherwise indicated. Do not prune for shape unless otherwise indicated.

2. Do not remove or reduce living branches to compensate for root loss caused by damaging or cutting root system.

3. Pruning Standards: Prune trees according to ANSI A300 (Part 1).

B. Unless otherwise directed by arborist and acceptable to Director's Representative, do not cut tree leaders.

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

D. Do not paint or apply sealants to wounds.

E. Provide subsequent maintenance pruning during Contract period as recommended by arborist.

F. Chip removed branches and dispose of off-site.

**3.09 FIELD QUALITY CONTROL**

A. Inspections: Engage a qualified arborist to direct plant-protection measures in the vicinity of trees, shrubs, and other vegetation indicated to remain and to prepare inspection reports.

**3.10 REPAIR AND REPLACEMENT**

A. General: Repair or replace trees, shrubs, and other vegetation indicated to remain or to be relocated that are damaged by construction operations, in a manner approved by Director's Representative.

1. Submit details of proposed pruning and repairs.

2. Perform repairs of damaged trunks, branches, and roots within 24 hours according to arborist's written instructions.

3. Replace trees and other plants that cannot be repaired and restored to full-growth status, as determined by Director's Representative.

B. Trees: Remove and replace trees indicated to remain that are more than 25 percent dead or in an unhealthy condition or are damaged during construction operations that Director's Representative determines are incapable of restoring to normal growth pattern.

1. Replacement Trees: Provide new trees of same size and species as those being replaced for each tree that measures 4 inches or smaller in caliper size. Plant and maintain new trees as directed by the Director's Representative.

C. Excess Mulch: Rake mulched area within protection zones, being careful not to injure roots. Rake to loosen and remove mulch that exceeds a 2-inch uniform thickness to remain. Do not place mulch within 6" of tree trunks.

D. Soil Aeration: Where directed by Director's Representative, aerate surface soil compacted during construction. Aerate 10 feet beyond drip line and no closer than 36 inches to tree trunk. Drill 2-inch diameter holes a minimum of 12 inches deep at 24 inches o.c. Backfill holes with an equal mix of augured soil and sand.

**3.11 AIR EXCAVATION IN TREE PROTECTION ZONE**

A. PPE Required: Wear appropriate protective work clothing and equipment. Cut and puncture resistant gloves, approved safety glasses, face protection and approved hearing protection must be worn while operating the Airspade. Eye protection should comply with ANSI Z87.1- 1989. Ear protection should provide NRR of at least 20Db.

B. Secure Site: Add Barriers and Cones to secure the area from other site workers being inadvertently struck by flying debris. Protect surfaces that could be chipped, or damaged by dislodged soil or rock particles adjacent to the excavation work area by using suitable drop cloths, screens or other means.

C. Prepare Site: Remove existing grass with sod cutter o Adjust depths of cutter to lowest measurement o

D. Special Note Within the CPZ: 10 foot radius is the Critical Root Zone and the Sod cutter should be gauged downward to 5/8th of an inch cutting into the soil

E. Grasses/Debris to be removed manually in beds and not put on tractor pulled through beds. Machinery should have boards underneath at all times to reduce further compaction and stress to trees.

F. Type of Aeration Technique: Radial Trenching: Trenching: with an air excavator, excavate a soil trench 3 to 6-inches wide and a minimum of 12-inches deep from (approximately) 3-feet from the trunk out to the dripline area. The trenches shall radiate out from one foot apart at the closest point.

G. Best Technique Chosen: Use an air spade to remove soil from around the roots and base of the tree trunk to expose root system.

H. Fill trenches with new top soil. Do not add fertilizer to the trees at it will burn the roots. After Radial Trenching Apply new soil to the trenches to cover exposed roots and level area for mulch application. Apply natural mulch within CRZ 10 foot Radius. Application of mulch within CRZ 3-inch average thickness of organic mulch. Do not place mulch within 6 inches of trunks or stems. (Radius of 10 feet per Tree). Sod up to the 10 foot radius of mulch. It is imperative that the Tree is adequately watered. ISA calls for 10 gallons of water per 1 DBH of Tree. Onsite Arborist should regulate and measure trees for exact rates. Plant Protection Fencing Installed Immediately. Color Orange. Tree Protection Signage needs to be updated immediately.

## 3.12 DISPOSAL OF SURPLUS AND WASTE MATERIALS

A. Disposal: Remove excess excavated material, displaced trees, trash, and debris and legally dispose of them off owner’s property.

**END OF SECTION**

# SECTION 31 20 02
# RELOCATING CANNONS

## PART 1 GENERAL

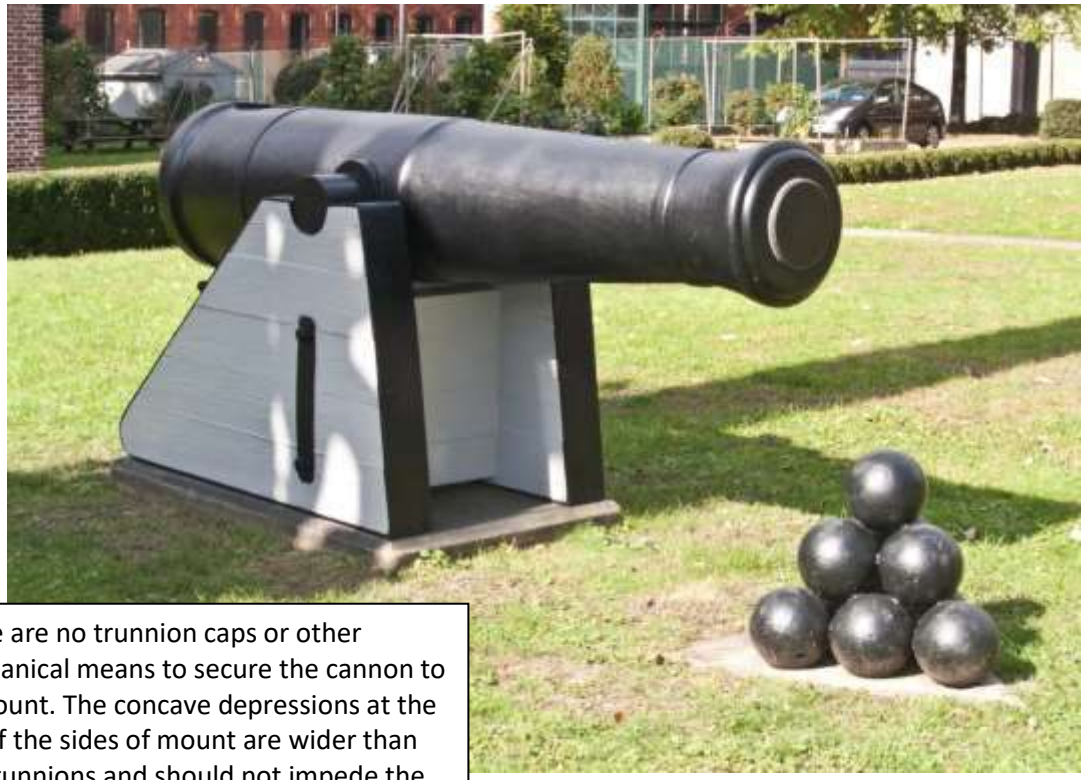
### 1.01 SECTION INCLUDES

**A. Relocate Seacoast Howitzers (2) - Flanking Civil War Monument**
PM.1989.1 – north of monument
PM.1989.2 – south of monument

- Each cannon weights approximately 3 tons. This does not include the weight of wooden mounts; each mount weighs approximately 150-200 lbs.
    - PM.1989.1 north gun = +/- 5840 lbs.
    - PM.1989.2 south gun = +/- 5836 lbs.
- The cannons and mounts are on concrete footings. Each footing is approximately the size of the bottom of the wooden mount. The mounts are not mechanically attached to the footings.
- The howitzers are supported/in contact with the mounts in TWO areas:
    1. at both trunnions (2)
    2. at the horizontal bar at the rear of the mount.

  The cannon does not rest on the wooden cross brace that spans between the two sides of the mount. The trunnions fit into half-round depression in the top surface of the sides of the mount, lined with banding. There are no trunnion caps or anything to mechanical secure the cannon to the mounts.
- Prepare & install new footings to support canon & Cannon ball stacks at specified locations.
    - Cannon footings to support each cannon's weight. Rectangular footing.
    - Cannon Ball stack footing to support cannon balls weight. Triangular footing.
- Secure lifting straps around the body of the howitzer. Test lift and reposition straps to archive a near horizontal lift.
    - Only use nylon straps. Do NOT use CHAINS.
    - DO NOT USE TRUNNIONS OR CASACBELL (ball at breech) FOR LIFTING
    - Place cannon on timbers on the ground.
- Position Mount on new footing. Check/adjust position
- Lift cannon and place on mount;
    - assure good contact is achieved between the trunnions and horizonal bar at the rear of the mount.
    - The howitzer should be aligned horizontally from breech to muzzle.
        - It the alignment is (slightly) off from horizontal, strive to have the muzzle (imperceptibly) lower, to allow for any moisture/water the accumulates within the bore to drain out.
- Protect Cannons & cannonball stacks during construction with snow fence and wood "tree guards" to prevent damage.
- There are stacks of 10 cannonballs in front of each howitzer.
- The stacks are on triangular concrete footings.

- Depressions have been made in the surface of the footings to accept the curved surfaces of the lower row of cannonballs.
- New footings made to accommodate the stacks of 10 cannonballs, 3 rows high with 3 balls on each side of the lower row. Footing to have depressions to fit cannonballs.



There are no trunnion caps or other mechanical means to secure the cannon to its mount. The concave depressions at the top of the sides of mount are wider than the trunnions and should not impede the removal of the cannon from the mount.

Seacoast Howitzers & Cannonballs


Horizontal bar at rear of mount spanning the sides supports the cannon

Seacoast Howitzers - Flanking Civil War Monument – Details

**B. Relocate Off-Site Spanish American Trophy Breech Rifle PM.1989.3**

- The cannon weighs approximately 5 Tons,
    - 9467 lbs.
    - This does not include the weight of the mount. The mount will be heavier than it appears; its side walls are 1" thick.
- The cannon and mount are on a raised concrete footing. The mount is not mechanically attached to the footing.
- The cannon is supported/in contact with the mount only in two areas – at the trunnions
    - The trunnions fit into half-round cut-outs at the top edge of the mount. There are no trunnion caps. It is possible that there might be a spot weld at the back and outer juncture of the trunnion to the mount; this weld should be broken before attempting to lift the cannon. Recently applied paint might also tend to adhere the cannon to the mount at the trunnions.
- Secure lifting straps around the body of the cannon. Test lift and reposition straps to achieve a near horizontal lift.
    - Use nylon straps Do Not Use CHAINS.
    - DO NOT USE TRUNNIONS FOR LIFTING Place cannon on transport vehicle or on timbers on ground.
    - cannon can also remain on timbers on the ground.

- Protect connon during constuction with snow fence and tree guards.
- Spanish American Trophy Breech Rifle to be transported to another site in Yonkers. Location TBD. Assume transport of 25 miles.
- **Spanish American Trophy Breech Rifle PM.1989.3**

Right trunnion with possiblel spot weld at contact with mount – outer left edge.

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**Spanish American Trophy Breech Rifle**
**PM.1989.3**

# SECTION 31 22 00

# EARTHWORK AND SITE GRADING

## PART 1 GENERAL

### 1.01 SECTION INCLUDES

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

B. Excavation and backfill of utility line trenches.

### 1.02 RELATED SECTIONS

A. Section 32 9218 – Landscape Grading.

B. Section 32 9219 – Sodding.

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 48 hour 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 against damage all bench marks, survey control points, existing structures, fences, sidewalks, paving, and curbs.

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 rain water 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 25 01
# EROSION AND SEDIMENT CONTROL

## PART 1 GENERAL

### 1.01 SECTION INCLUDES

A. Provide all labor, equipment and materials necessary to install and maintain erosion & sediment control measures including, sediment control fence, stabilized construction entrance, dust control, and construction sequencing.

B. Provide all labor, equipment and materials necessary to implement erosion control measures, as required by regulatory permits, and as job conditions dictate. The Director's Representative will retain the services of a qualified professional to inspect and report on erosion control activities.

### 1.02 RELATED SECTIONS

A. Section 31 2200: Earthwork and Site Grading.

B. Section 32 2001: Temporary Tree and Plant Protection.

### 1.03 REFERENCES

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

### 1.04 SUBMITTALS FOR REVIEW

A. Shop Drawings and Product Data. Submit manufacturer's technical product data for all erosion and sediment control products.

B. 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.

B. USDA Soil Conservation Service "Guidelines for Urban Erosion and Sediment Control", latest revision.

C. Local Guidelines for Erosion and Sediment Control.

D. NYSDOT Specifications.

E. Directives of Director's Representative, and/or regulatory personnel of authority having jurisdiction requiring further control measures as warranted.

### 1.06 SEQUENCING AND SCHEDULING

A. Place erosion control measures wherever shown on the Contract Drawings before beginning any other Work of this Contract.

B. Place other erosion control measures shown on the Contract Drawings as soon as possible, relative to other Work of this Contract including, but not limited to, the following:

1. At grading limits, before beginning rough grading.

2. At all disturbed ground and subgrade as specified.

## PART 2 - PRODUCTS

## 2.01 SEDIMENT CONTROL FENCE

A. The sediment control fence fabric shall meet the following specifications:

| Fabric Properties | Minimum Acceptable Value | Test Method |
|---|---|---|
| Grab Tensile Strength (lbs) | 90 | ASTM D1682 |
| Elongation at Failure (%) | 50 | ASTM D1682 |
| Mullen Burst Strength (psi) | 190 | ASTM D3786 |
| Puncture Strength (lbs) | 40 | ASTM D751 |
| Slurry Flow Rate (gpm/sf) | 0.3 | |
| Equivalent Opening Size | 40-80 | US Std Sieve |
| Ultraviolet Radiation Stab. (%) | 90 | ASTM G26 |

B. Fence Posts: The length shall be a minimum of 36” long. Wood posts shall be of a sound quality hardwood with a minimum cross-sectional area of 2.0 square inches.

## 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 ADDITIONAL PRODUCTS:

A. As specified and illustrated on the project plans, as required by regulatory permits, and as job conditions dictate.

## PART 3 - EXECUTION

## 3.01 EROSION AND SEDIMENT CONTROL

A. Erosion and sediment controls must be constructed, stabilized and functional before site disturbance within the tributary area to those controls.

B. Upon completion of installation of the erosion and sediment controls, the site will be inspected and any areas identified with a significant erosion potential will receive fortified erosion control measures, as determined by the Director’s Representative or other Agency having jurisdiction.

C. The Contractor shall utilize diversionary tactics for containing runoff and directing it towards erosion control devices as needed to minimize sedimentation.

D. All erosion and sediment control devices 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.

E. Any disturbed area on which activity has ceased must be stabilized immediately. During non-germinating periods, mulch must be applied at the recommended rates.

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

**3.02** Contractor shall implement erosion control measures as shown on the plans and as job conditions dictate. Intent is to minimize erosion and pollutants at the source, capture sediment at regular intervals and prevent sediment intrusion into storm sewer pipes, structures, and waterways. Work includes, but is not limited to, mulching, temporary silt fences, tree protection, stabilized construction entrance, expeditious grading, stormwater diversion, prompt turf and plant establishment, and maintenance of same.

**3.03** The Contractor shall initiate stabilization measures as soon as practicable in portions of the site where construction activities have temporarily or permanently ceased, but in no case more than 14 days after the construction activity in that portion of the site has temporarily or permanently ceased. If disturbed soils surfaces are to be left exposed for a period of greater than 14 days, stabilize the soil with temporary seeding and/or mulch to limit erosion. Where the initiation of stabilization measures by the 14$^{th}$ day after construction activity temporarily or permanently ceased is precluded by snow cover or frozen ground conditions, stabilization measures shall be initiated as soon as practicable. The onset of seasonally adverse weather is not intended as our excuse for not implementing the necessary erosion controls. The Contractor shall use foresight in his activities to only disturb areas that he can stabilize before adverse weather conditions prevail. The Contractor is encouraged to schedule his work such that final land surface restoration closely follows initial disturbance to the maximum extent possible in order to limit bare soil exposure and dependence on the temporary systems discussed above.

**3.04** 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.

**3.05 AUTHORITY OF WORK**

A. The Director's Representative has the authority to limit the surface area of erodible earth material exposed by clearing and grubbing, the surface area of erodible earth material exposed by excavation, borrow and fill operations and to direct the Contractor to provide immediate permanent or temporary pollution control measures to prevent contamination of adjacent streams or other watercourses/waterbodies.

**3.06 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 Director'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.

**3.07 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.

## 3.08 SEDIMENT CONTROL FENCE INSTALLATION

A. A silt fence shall be used where shown on the plans.

B. Embed silt fence material a minimum of 8 inches below finished grade.

C. When two sections of filter cloth adjoin each other, they shall be overlapped by six inches and folded.

D. Maintenance shall be performed as needed and material removed when Abulges@ develop in the silt fence, or when 6 inches of sediment has accumulated against it, whichever occurs first. All sediment barriers shall be repaired or replaced when they no longer function as a barrier.

## 3.09 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.

## 3.10 CONSTRUCTION SCHEDULE

A. Prior to beginning construction, the Contractor shall submit a detailed project schedule which outlines his program for controlling erosion, limiting conveyance of silt and sediment, pollution prevention, maintenance of devices/controls, and restoration of graded surfaces for the duration of the project and the one-year warranty period, for review and acceptance.

## 3.11 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.

## 3.12 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.

## 3.13 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**