

Approved: 2010-12-31

Part 1 General

1.1 RELATED REQUIREMENTS

- .1 Section 31 05 16 – Aggregates for Earthworks
- .2 Section 31 11 00 – Clearing and Grubbing
- .3 Section 31 22 13 – Rough Grading
- .4 Section 31 22 33 01 – Excavating, Trenching and Backfilling

1.2 MEASUREMENT PROCEDURES

- .1 Backfill-Import will be paid in accordance with unit rate price established per weight for backfill material imported. Measurement as recorded on backfill source weigh scale certified by Measurement Canada receipts and results provided to Departmental Representative. Includes provision, transport to Site, onsite transport, placing, grading and compacting.

1.3 REFERENCE STANDARDS

- .1 ASTM International
 - .1 ASTM D698-[07e1], Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft³) (600kN-m/m³).
- .2 U.S. Environmental Protection Agency (EPA)/Office of Water
 - .1 EPA 832/R-92-005, Storm Water Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00- Submittal Procedures.
- .2 Sustainable Design Submittals:
 - .1 Erosion and Sedimentation Control: submit erosion and sedimentation control plan in accordance with authorities having jurisdiction.
 - .2 Construction Waste Management:
 - .1 Submit project Waste Management Plan highlighting recycling and salvage requirements.

Part 2 Products

2.1 MATERIALS

- .1 Type 2 gravel fill, as defined by Nova Scotia Transportation and Infrastructure Renewal Standard Specification, Highway Construction and Maintenance (most recent edition), compacted to not less than 95% Standard Proctor Maximum Dry Density as per ASTM D698.

- .2 Rock fill, applied below water table, if necessary. Shall meet the requirements of NSTIR Standard Specifications, with a maximum size of 300 mm.
- .3 Gravel – 50 mm minus crushed stone, for excavation cap.

Part 3 Execution

3.1 EXAMINATION

- .1 Verification of Conditions:
 - .1 Before commencing work verify locations of buried services on and adjacent to site.
- .2 Evaluation and Assessment:
 - .1 Arrange with appropriate authority for relocation of buried services that interfere with execution of work. Pay costs of relocating services.
 - .2 Testing of materials and compaction of backfill and unshrinkable fill will be carried out by testing laboratory designated by Departmental Representative.
 - .3 Not later than 1 week before backfilling or filling, provide to designated testing agency, 23 kg sample of backfill material[s] proposed for use.
 - .4 Not later than 48 hours before backfilling or filling with approved material, notify Departmental Representative so that compaction tests can be carried out by designated testing agency.
 - .5 Before commencing work, conduct, with Departmental Representative, condition survey of existing structures, trees and plants, lawns, fencing, service poles, wires, rail tracks and paving, survey bench marks and monuments which may be affected by work.
 - .6 Conduct a topographic survey of all excavation areas to determine pre-excavation elevations, for excavation volume calculation purposes.

3.2 PREPARATION

- .1 Temporary Erosion and Sedimentation Control:
 - .1 Use temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, in accordance with the sediment and erosion control plan (Section 01 35 43 – Environmental Procedures), specific to site, to EPA 832/R-92-005 and/or requirements of authorities having jurisdiction.
 - .2 Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.
 - .3 Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.
- .2 Protection of in-place conditions:
 - .1 Protect excavations from freezing.
 - .2 Keep excavations clean, free of standing water, and loose soil.

- .3 Where soil is subject to significant volume change due to change in moisture content, cover and protect to Departmental Representative's approval.
 - .4 Protect natural and man-made features required to remain undisturbed. Unless otherwise indicated or located in an area to be occupied by new construction, protect existing trees from damage.
 - .5 Protect buried services that are to remain undisturbed.
- .3 Removal:
- .1 Remove obsolete buried services within 2 m of foundations. Cap cut-offs.
 - .2 Remove obstructions, ice and snow, from surfaces to be excavated within limits indicated.
 - .3 Cut pavement or sidewalk neatly along limits of proposed excavation in order that surface may break evenly and cleanly.
 - .4 Remove trees, stumps, logs, brush, shrubs, bushes, vines, undergrowth, rotten wood, dead plant material, exposed boulders and debris within areas designated on drawings.
 - .5 Remove stumps and tree roots below footings, slabs, and paving, and to 600mm below finished grade elsewhere.

3.3 EXCAVATION

- .1 Shore and brace excavations, protect slopes and banks and perform work in accordance with Provincial and Municipal regulations.

3.4 SITE QUALITY CONTROL

- .1 Fill material and spaces to be filled to be inspected and approved by Departmental Representative.

3.5 BACKFILLING

- .1 Start backfilling only after inspection and receipt of written approval of fill material and spaces to be filled from Departmental Representative.
- .2 Remove snow, ice, construction debris, organic soil and standing water from spaces to be filled.
- .3 Placing:
 - .1 Place backfill in 150 mm lifts. Add water as required to achieve specified density.
 - .2 Place gravel capping material in 150 mm lifts, to design requirement of minimum 300 mm cap.
- .4 Compaction: compact each layer of material to following standard proctor maximum dry densities for material to ASTM D698:
 - .1 All areas: 95%.
 - .2 Documentation demonstrating that required compaction has been achieved to be provided to Departmental Representative for review.

3.6 GRADING

- .1 Grade to ensure that water will not pool, and will drain towards Tufts Cove or Halifax Harbour.

3.7 CLEANING

- .1 Progress Cleaning:
 - .1 Dispose of cleared and grubbed material off site daily.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment.
- .3 Waste Management: separate waste materials for recycling/reuse in accordance with Section 01 74 19 - Waste Management and Disposal.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

- .1 Section 31 00 99 – Earthworks for Minor Works
- .2 Section 31 11 00 – Clearing and Grubbing
- .3 Section 31 22 13 – Rough Grading
- .4 Section 31 22 33 01 – Excavating, Trenching and Backfilling

1.2 REFERENCE STANDARDS

- .1 ASTM International (ASTM)
 - .1 ASTM D4791-[10] , Standard Test Method for Flat Particles, Elongated Particles, or Flat and Elongated Particles in Coarse Aggregate.
 - .2 ASTM C136-06, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
 - .3 ASTM C117-13, Standard Test Method for Materials Finer than 75 µm Sieve in Mineral Aggregates by Washing.
- .2 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-8.1-88, Sieves, Testing, Woven Wire, Inch Series.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00- Submittal Procedures.
- .2 Samples:
 - .1 Submit a 23 kg sample of each type of backfill material that will be used on the Site to the designated testing agency, not later than 1 week before backfilling is to take place.
 - .2 Pay cost of sampling and testing of aggregates which fail to meet specified requirements.

1.4 DELIVERY, STORAGE AND HANDLING

- .1 Transportation and Handling: handle and transport aggregates to avoid segregation, contamination and degradation.

Part 2 Products

2.1 MATERIALS

- .1 Aggregate quality: sound, hard, durable material free from soft, thin, elongated or laminated particles, organic material, clay lumps or minerals, free from adherent coatings and injurious amounts of disintegrated pieces or other deleterious substances.
- .2 Flat and elongated particles of coarse aggregate: to ASTM D4791.

- .1 Greatest dimension to exceed 5 times least dimension.
- .3 Coarse aggregates satisfying requirements of applicable section to be one of or blend of following:
 - .1 Crushed rock.
 - .2 Gravel and crushed gravel composed of naturally formed particles of stone.
 - .3 Light weight aggregate, including slag and expanded shale.

2.2 SOURCE QUALITY CONTROL

- .1 Inform Departmental Representative of proposed source of aggregates and provide access for sampling 4 weeks minimum before starting production.
- .2 If materials from proposed source do not meet, or cannot reasonably be processed to meet, specified requirements, locate alternative source.
- .3 Advise Departmental Representative 4 weeks minimum in advance of proposed change of material source.
- .4 Acceptance of material at source does not preclude future rejection if it fails to conform to requirements specified, lacks uniformity, or if its field performance is found to be unsatisfactory.

Part 3 Execution

3.1 PREPARATION

- .1 Stockpiling:
 - .1 Stockpile aggregates on site in locations as indicated unless directed otherwise by Departmental Representative. Do not stockpile on completed pavement surfaces.
 - .2 Stockpile aggregates in sufficient quantities to meet project schedules.
 - .3 Stockpiling sites to be level, well drained, and of adequate bearing capacity and stability to support stockpiled materials and handling equipment.
 - .4 Except where stockpiled on acceptably stabilized areas, provide compacted sand base not less than 300 mm in depth to prevent contamination of aggregate. Stockpile aggregates on ground but do not incorporate bottom 300 mm of pile into Work.
 - .5 Separate different aggregates by strong, full depth bulkheads, or stockpile far enough apart to prevent intermixing.
 - .6 Do not use intermixed or contaminated materials. Remove and dispose of rejected materials as directed by Departmental Representative within 48 hours of rejection.
 - .7 Uniformly spot-dump aggregates delivered to stockpile in trucks and build up stockpile as specified.
 - .8 Do not cone piles or spill material over edges of piles.
 - .9 Do not use conveying stackers.
 - .10 During winter operations, prevent ice and snow from becoming mixed into stockpile or in material being removed from stockpile.

3.2 CLEANING

- .1 Progress Cleaning
 - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion, remove surplus materials, rubbish, tools and equipment.
- .3 Leave aggregate stockpile site in tidy, well drained condition, free of standing surface water.
- .4 Leave any unused aggregates in neat compact stockpiles as directed by Departmental Representative.
- .5 Waste Management: separate waste materials in accordance with Section 01 74 19 - Waste Management and Disposal.
 - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.
- .6 Restrict public access to temporary or permanently abandoned stockpiles by means acceptable to Departmental Representative.

END OF SECTION

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Part 1 General

1.1 RELATED REQUIREMENTS

- .1 Section 31 23 33.01 - Excavation, Trenching and Backfilling.

1.2 MEASUREMENT PROCEDURES

- .1 Maintenance of erosion and sediment control measures will be paid in accordance with lump sum price established to inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established on site as reviewed and accepted by the Departmental Representative.

1.3 REFERENCE STANDARDS

- .1 U.S. Environmental Protection Agency (EPA)/Office of Water
 - .1 EPA 832R92005, Storm Water Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices.

1.4 DEFINITIONS

- .1 Clearing consists of cutting off trees and brush vegetative growth to not more than specified height above ground and disposing of felled trees, previously uprooted trees and stumps, and surface debris.
- .2 Grubbing consists of excavation and disposal of stumps and to not less than specified depth below existing ground surface.

1.5 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00- Submittal Procedures.

1.6 QUALITY ASSURANCE

- .1 Do construction occupational health and safety in accordance with Section 01 35 29 13- Health, Safety, and Emergency Response Procedures for Contaminated Sites.
- .2 Safety Requirements: worker protection.

1.7 STORAGE AND PROTECTION

- .1 Prevent damage to fencing, root systems of trees, trees, and water courses, which are to remain.
 - .1 Repair damaged items to approval of Departmental Representative.
 - .2 Replace trees designated to remain, if damaged, as directed by Departmental Representative.

1.8 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate waste materials for recycling / reuse in accordance with Section 01 74 19- Waste Management and Disposal.

Part 2 Execution

2.1 TEMPORARY EROSION AND SEDIMENTATION CONTROL

- .1 Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to the sediment and erosion control plan, or requirements of authorities having jurisdiction, whichever is more stringent. Work to be done in accordance with the Erosion and Sedimentation Control Plan, as described in Section 01 35 43 – Environmental Procedures.
- .2 Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.
- .3 Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

2.2 PREPARATION

- .1 Inspect site and verify with Departmental Representative, items designated to remain.
- .2 Locate and protect utility lines: preserve in operating condition active utilities traversing site.
 - .1 Notify Departmental Representative immediately of damage to or when unknown existing utility line[s] are encountered.
 - .2 When utility lines which are to be removed are encountered within area of operations, notify Departmental Representative in ample time to minimize interruption of service.
- .3 Notify utility authorities before starting clearing and grubbing.
- .4 Keep roads and walks free of dirt and debris.

2.3 CLEARING

- .1 Clearing includes, cutting, felling, and trimming of trees into sections and satisfactory disposal of trees and other vegetation designated for removal, including brush, downed timber, rubbish, and snags occurring within cleared areas.
- .2 Clear as indicated by Departmental Representative, by cutting at height of not more than 300 mm above ground. In areas to be subsequently grubbed, height of stumps left from clearing operations to be not more than 1000 mm above ground surface.
- .3 Cut off branches and/or cut down trees overhanging area cleared as directed by Departmental Representative.
- .4 Cut off unsound branches on trees designated to remain as directed by Departmental Representative.

2.4 GRUBBING

- .1 Remove and dispose of roots larger than 7.5 cm in diameter, matted roots, and designated stumps from indicated grubbing areas.
- .2 Grub out stumps and roots to not less than 200 mm below ground surface.

- .3 Grub out visible rock fragments and boulders, greater than 300 mm in greatest dimension, but less than 0.25 m³.

2.5 REMOVAL AND DISPOSAL

- .1 Remove cleared and grubbed materials off-site to disposal area as indicated by Departmental Representative.

2.6 FINISHED SURFACE

- .1 Leave ground surface in condition suitable for immediate grading operations to approval of Departmental Representative.

2.7 CLEANING

- .1 On completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, flagging tape, tools and equipment.

END OF SECTION

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Part 1 General

1.1 RELATED REQUIREMENTS

- .1 Section 31 05 16 – Aggregates for Earthworks
- .2 Section 31 23 33 01 – Excavating, Trenching and Backfilling

1.2 REFERENCE STANDARDS

- .1 ASTM International
 - .1 ASTM D698-07e1, Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (600 kN-m/m³).

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.

1.4 EXISTING CONDITIONS

- .1 Refer to dewatering in Section 31 23 33.01- Excavating, Trenching and Backfilling.
- .2 Rough grading will only occur after remedial excavation is completed, and excavations have been backfilled.

Part 2 Product

2.1 MATERIALS

- .1 Fill materials in accordance with Section 31 05 16 - Aggregate Materials and Section 31 23 33.01- Excavating, Trenching and Backfilling.
- .2 Excavated or graded material existing on site suitable to use as fill for grading work if approved by Departmental Representative.

Part 3 Execution

3.1 EXAMINATION

- .1 Verification of Conditions: verify that conditions of backfill previously installed under other Sections are acceptable for rough grading.
 - .1 Visually inspect backfill in presence of Departmental Representative.

3.2 GRADING

- .1 Rough grade to levels, profiles, and contours allowing for surface treatment (gravel cap) as indicated.
- .2 Rough grade to following depths below finish grades:
 - .1 As indicated on Drawings or as directed by Departmental Representative.

- .3 Grade ditches to depth required for maximum run-off as indicated by Departmental Representative.
- .4 Compact filled and disturbed areas to maximum dry density to ASTM D698, as follows:
 - .1 95% in all areas.
- .5 Do not disturb soil within branch spread of trees or shrubs to remain.

3.3 TESTING

- .1 Submit testing procedure, and frequency of tests, to Departmental Representative for approval.

3.4 CLEANING

- .1 Progress Cleaning:
 - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment.
- .3 Waste Management: separate waste materials for recycling in accordance with Section 01 74 19 - Waste Management and Disposal.
 - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

3.5 PROTECTION

- .1 Protect existing trees, fencing, landscaping, natural features, bench marks, buildings, pavement, surface or underground utility lines which are to remain as directed by Departmental Representative. If damaged, restore to original or better condition unless directed otherwise.
- .2 Maintain access roads to prevent accumulation of construction related debris on roads.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

- .1 Section 02 50 00 – Site Remediation
- .2 Section 31 00 99 – Earthworks for Minor Works
- .3 Section 31 05 16 – Aggregates for Earthwork

1.2 MEASUREMENT PROCEDURES

- .1 Excavation (including transportation and off-site disposal, and groundwater management) will be paid in accordance with unit rate price established per weight for material removed to excavate material to extents shown on Drawings. Measurement as recorded on disposal source weigh scale certified by Measurement Canada receipts and results provided to Departmental Representative on Certificates of Disposal. Includes loading, hauling, interim storage, handling and disposal for all material transported from Site. If material is taken to a Treatment Facility-Offsite before a Disposal Facility, payment includes transport and handling to both Treatment Facility and Disposal Facility.
- .2 Shoring, bracing, cofferdams, underpinning and de-watering of excavation will not be measured separately for payment.
- .3 Backfill-Import will be paid in accordance with unit rate price established per weight for backfill material imported. Measurement as recorded on backfill source weigh scale certified by Measurement Canada receipts and results provided to Departmental Representative. Includes provision, transport to Site, onsite transport, placing, grading and compacting.

1.3 REFERENCE STANDARDS

- .1 American Society for Testing and Materials International (ASTM)
 - .1 ASTM C136-05, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
 - .2 ASTM D422-632002, Standard Test Method for Particle-Size Analysis of Soils.
 - .3 ASTM D698-00ae1, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft³) (600 kN-m/m³).
- .2 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-8. 1-88, Sieves, Testing, Woven Wire, Inch series.
 - .2 CAN/CGSB-8. 2-M88, Sieves, Testing, Woven Site, Metric.

1.4 DEFINITIONS

- .1 Excavation classes: one class of excavation will be recognized; common excavation.
- .2 Waste material: excavated material unsuitable for use in Work or surplus to requirements.
- .3 Borrow material: material obtained from locations outside area to be excavated and required for construction of fill areas or for other portions of Work.

- .4 Recycled fill material: material, considered inert, obtained from alternate sources and engineered to meet requirements of fill areas.

1.5 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Make submittals in accordance with Section 01 33 00- Submittal Procedures.
- .2 Quality Control: in accordance with Section 01 45 00 - Quality Control:
 - .1 Submit condition survey of existing conditions as described in EXISTING CONDITIONS article of this Section.
 - .2 Submit for review by Departmental Representative proposed dewatering methods.
 - .3 Submit to Departmental Representative written notice when bottom of excavation is reached.
 - .4 Submit to Departmental Representative testing/ inspection results, as required.
- .3 Preconstruction Submittals:
 - .1 Submit construction equipment list for major equipment to be used in this section prior to start of Work.
 - .2 Submit records of underground utility locates, indicating: clearance record from utility authority.
- .4 Samples:
 - .1 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.
 - .2 Inform Departmental Representative at least 10 days prior to beginning Work, of proposed source of fill materials and provide access for sampling.
 - .3 Submit 23 kg samples of type of fill specified, to designated testing agency.

1.6 QUALITY ASSURANCE

- .1 Qualification Statement: submit proof of insurance coverage for comprehensive general liability and pollution liability
- .2 Submit proposed work procedures at least 2 weeks prior to beginning Work.
- .3 Keep copy of proposed work procedures on site.
- .4 Do not use soil material until written report of soil test results are approved by Departmental Representative.
- .5 Health and Safety Requirements:
 - .1 Do construction occupational health and safety in accordance with Section 01 35 29.13- Health, Safety, and Emergency Response Procedures for Contaminated Sites.

1.7 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate waste materials for recycling/reuse in accordance with Section 01 74 19 - Waste Management and Disposal.
- .2 Divert excess aggregate materials from landfill to local facility for recycling/reuse as directed by Departmental Representative.

1.8 EXISTING CONDITIONS

- .1 Examine Drawings.
- .2 Buried services:
 - .1 Before commencing work verify/establish location of buried services on and adjacent to site.
 - .2 Arrange with appropriate authority for relocation of buried services that interfere with execution of work: pay costs of relocating services.
 - .3 Size, depth and location of existing utilities and structures as indicated are for guidance only. Completeness and accuracy are not guaranteed.
 - .4 Prior to beginning excavation Work, notify Departmental Representative and establish location and state of use of buried utilities and structures. Departmental Representative to clearly mark such locations to prevent disturbance during Work.
 - .5 Confirm locations of buried utilities by careful soil hydrovac methods.
 - .6 Maintain and protect from damage, water, sewer, gas, electric, telephone and other utilities and structures encountered.
 - .7 Where utility lines or structures exist in area of excavation, obtain direction of Departmental Representative before re-routing.
 - .8 Record location of maintained, re-routed and abandoned underground lines.
 - .9 Confirm locations of recent excavations adjacent to area of excavation.
- .3 Existing buildings and surface features:
 - .1 Conduct, with Departmental Representative, condition survey of existing buildings, trees and other plants, lawns, fencing, service poles, wires, rail tracks, pavement, survey bench marks and monuments which may be affected by Work.
 - .2 Protect existing buildings and surface features from damage while Work is in progress. In event of damage, immediately make repair as directed by Departmental Representative.
 - .3 Where required for excavation, cut roots or branches as directed by Departmental Representative.
- .4 Topographic Survey:
 - .1 Complete a topographic survey of all excavation areas, prior to any excavation activities, and provide to the Departmental Representative.

Part 2 Products

2.1 MATERIALS

- .1 Type 1 and Type 2 fill: properties as per Section 31 05 16 - Aggregates for Earthworks.
- .2 Environmental Protection Supplies as per Section 01 35 43 – Environmental Procedures.

2.2 TEMPORARY EROSION AND SEDIMENTATION CONTROL

- .1 Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and

walkways, according to requirements of authorities having jurisdiction or requirements of sediment and erosion control plan (Section 01 35 43 – Environmental Protection), which ever is more stringent.

- .2 Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.
- .3 Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

2.3 SITE PREPARATION

- .1 Remove obstructions, ice and snow, from surfaces to be excavated within limits indicated.

2.4 PREPARATION/PROTECTION

- .1 Protect existing features in accordance with Section 01 56 00 - Temporary Barriers and Enclosures and applicable local regulations.
- .2 Keep excavations clean, free of standing water, and loose soil.
- .3 Where soil is subject to significant volume change due to change in moisture content, cover and protect to Departmental Representative approval.
- .4 Protect natural and man-made features required to remain undisturbed. Unless otherwise indicated or located in an area to be occupied by new construction, protect existing trees from damage.
- .5 Protect buried services that are required to remain undisturbed.

2.5 STOCKPILING

- .1 Stockpile fill materials in areas designated by Departmental Representative.
 - .1 Stockpile granular materials in manner to prevent segregation.
- .2 Protect fill materials from contamination.
- .3 Implement sufficient erosion and sediment control measures to prevent sediment release off construction boundaries and into water bodies.

2.6 DEWATERING AND HEAVE PREVENTION

- .1 Keep excavations free of water while Work is in progress.
- .2 Provide for approval by Departmental Representative details of proposed dewatering methods, including dikes, well points, and sheet pile cut-offs.
- .3 Avoid excavation below groundwater table if quick condition or heave is likely to occur.
 - .1 Prevent piping or bottom heave of excavations by groundwater lowering, sheet pile cut-offs, or other means.
- .4 Protect open excavations against flooding and damage due to surface run-off.
- .5 Dispose of water in accordance with Section 01 35 43 - Environmental Procedures to approved collection runoff areas and in manner not detrimental to public and private property, or portion of Work completed or under construction.

- .1 Provide and maintain temporary drainage ditches and other diversions outside of excavation limits.
- .6 Provide flocculation tanks, settling basins, or other treatment facilities to remove suspended solids or other materials before discharging to storm sewers, watercourses or drainage areas.

2.7 EXCAVATION

- .1 Excavate to lines, grades, elevations and dimensions as indicated by Departmental Representative.
- .2 Remove demolished foundations and rubble, paving, concrete, masonry, and other obstructions encountered during excavation.
- .3 Do not disturb soil within branch spread of trees or shrubs that are to remain.
 - .1 If excavating through roots, excavate by hand and cut roots with sharp axe or saw.
- .4 Keep excavated and stockpiled materials safe distance away from edge of excavation as directed by Departmental Representative.
- .5 Restrict vehicle operations directly adjacent to open excavations.
- .6 Dispose of surplus and unsuitable excavated material in approved location on site.
- .7 Do not obstruct flow of surface drainage or natural watercourses.
- .8 Notify Departmental Representative when bottom of excavation is reached.
- .9 Obtain Departmental Representative approval of completed excavation.
- .10 Remove unsuitable material from trench bottom including those that extend below required elevations to extent and depth as directed by Departmental Representative.
- .11 Correct unauthorized over-excavation as follows:
 - .1 Fill under other areas with Type 2 fill compacted to not less than 95% of corrected Standard Proctor maximum dry density.
- .12 Hand trim, make firm and remove loose material and debris from excavations.
 - .1 Where material at bottom of excavation is disturbed, compact foundation soil to density at least equal to undisturbed soil.

2.8 FILL TYPES AND COMPACTION

- .1 Use types of fill as and compaction as indicated in Section 31 00 99 – Earthwork for Minor Works.

2.9 BACKFILLING

- .1 Do not proceed with backfilling operations until completion of following:
 - .1 Departmental Representative has obtained and analyzed confirmatory soil excavation boundary samples, and has approved backfilling of excavations.
 - .2 Confirmation Sampling, analysis, and assessment will be completed by the Departmental Representative. Confirmation Sampling, analysis, and assessment

may take up to 5 Working Days. No increases to Contract Amount or Extension of Time for completion of the Work can be incurred for Confirmation Sampling results provided within 5 Working Days, not including day of sample collection.

- .2 Areas to be backfilled to be free from debris, snow, ice, water and frozen ground.
- .3 Do not use backfill material which is frozen or contains ice, snow or debris.
- .4 Place backfill material in accordance with Section 31 00 99 – Earthworks for Minor Works.

2.10 RESTORATION

- .1 Clean and reinstate areas affected by Work as directed by Departmental Representative.
- .2 Protect newly graded areas from traffic and erosion and maintain free of trash or debris.

END OF SECTION