

## **Part 1 General**

### **1.1 REFERENCES**

- .1 American Society for Testing and Materials (ASTM).
  - .1 ASTM C127-07, Standard Test Method for Density, Relative Density (Specific Gravity) and Absorption of Coarse Aggregate.
  - .2 ASTM D698-07e1, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort.
  - .3 ASTM D 4253-00, Standard Test Methods for Maximum Index Density of Soils Using a Vibratory Table.
- .2 All references to be latest revision.

### **1.2 DEFINITION**

- .1 Corrected maximum dry density is defined as:
  - .1  $D = F1 \times D1 + 0.9 \times D2 \times F2$ 

Where: D = corrected maximum dry density kg/m<sup>3</sup>  
F1 = fraction (decimal) of total field sample passing ASTM 4.75 mm sieve.  
F2 = fraction (decimal) of total field sample retained on ASTM 4.75 mm sieve (equal to 1 – F1)  
D1 = maximum dry density, kg/m<sup>3</sup> of material passing ASTM 4.75 mm sieve determined in accordance with ASTM D 698-00a.  
D2 = bulk density, kg/m<sup>3</sup>, of material retained on 4.75 mm sieve, equal to 1000 G, where G is bulk specific gravity material (dry basis) when tested to ASTM C 127-88 (2001).

For free draining aggregates, determine D1 (maximum dry density) to ASTM D 4253-00 wet method.

## **Part 2 Products – Not Used**

## **Part 3 Execution – Not Used**

**END OF SECTION**

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**Part 1            General**

**1.1            RELATED REQUIREMENTS**

- .1    Section 32 11 19 - Granular Sub-base.
- .2    Section 32 11 23- Aggregate Base-course.
- .3    Section 32 12 16.02 – Asphalt Paving for Building Sites

**1.2            REFERENCES**

- .1    ASTM International
  - .1    ASTM D4791-[10], Standard Test Method for Flat Particles, Elongated Particles, or Flat and Elongated Particles in Coarse Aggregate.
- .2    Canada Green Building Council (CaGBC)
  - .1    LEED Canada-NC Version 1.0, LEED (Leadership in Energy and Environmental Design): Green Building Rating System for New Construction and Major Renovations .
  - .2    LEED Canada-NC-, LEED (Leadership in Energy and Environmental Design): Green Building Rating System for New Construction and Major Renovations.
  - .3    LEED Canada-CI Version 1.0, LEED (Leadership in Energy and Environmental Design): Green Building Rating System for Commercial Interiors.
  - .4    LEED Canada-EB: O M, LEED (Leadership in Energy and Environmental Design): Green Building Rating System for Existing Buildings: Operations and Maintenance .
- .3    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.
- .4    All references to be latest revision.

**1.3            ACTION AND INFORMATIONAL SUBMITTALS**

- .1    Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2    Product Data:
  - .1    Submit manufacturer's instructions, printed product literature and data sheets for aggregate materials and include product characteristics, performance criteria, physical size, finish and limitations.
- .3    Samples:
  - .1    Submit samples if requested by Department Representative.
  - .2    Allow continual sampling by Departmental Representative during production if requested.

- .3 Provide Departmental Representative with access to source and processed material for sampling.
- .4 Supply new or clean sample bags or containers according appropriate to aggregate materials.
- .5 Pay cost of sampling and testing of aggregates which fail to meet specified requirements.

#### **1.4 DELIVERY, STORAGE AND HANDLING**

- .1 Deliver, store and handle materials in accordance with Section with manufacturer's written instructions.
- .2 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 Fine aggregates satisfying requirements of applicable section to be one, or blend of following:
  - .1 Screenings produced in crushing of quarried rock, boulders, gravel or slag.
- .4 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.

#### **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 if requested.
- .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.

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**Part 3            Execution**

**3.1                EXAMINATION**

- .1 Aggregate source preparation:
  - .1 Prior to excavating materials for aggregate production, clear and grub area to be worked, and strip unsuitable surface materials. Dispose of cleared, grubbed and unsuitable materials as approved by authority having jurisdiction.
  - .2 Where clearing is required, leave screen of trees between cleared area and roadways as directed.
  - .3 Clear, grub and strip area ahead of quarrying or excavating operation sufficient to prevent contamination of aggregate by deleterious materials.
  - .4 When excavation is completed dress sides of excavation to nominal 2:1 slope, and provide drains or ditches as required to prevent surface standing water.
  - .5 Trim off and dress slopes of waste material piles and leave site in neat condition.
  - .6 Provide silt fence or other means to prevent contamination of existing watercourse or natural wetland features.
- .2 Processing:
  - .1 Process aggregate uniformly using methods that prevent contamination, segregation and degradation.
  - .2 Blend aggregates, as required, including reclaimed materials that meet physical requirements of specification is permitted in order to satisfy gradation requirements for material and, percentage of crushed particles, or particle shapes specified.
- .3 When operating in stratified deposits use excavation equipment and methods that produce uniform, homogeneous aggregate gradation.
- .4 Where necessary, screen, crush, wash, classify and process aggregates with suitable equipment to meet requirements.
- .5 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 Separate different aggregates by strong, full depth bulkheads, or stockpile far enough apart to prevent intermixing.
  - .5 Do not use intermixed or contaminated materials. Remove and dispose of rejected materials as directed by Departmental Representative within 48 hours of rejection.
  - .6 Stockpile materials in uniform layers of thickness as follows:
    - .1 Maximum 1.5 m for all materials.
  - .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.

### **3.2 CLEANING**

- .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove all surplus materials, rubbish, tools and equipment.
- .3 Waste Management: separate waste materials for recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
  - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.
- .4 For temporary or permanent abandonment of aggregate source, restore source to condition meeting requirements of authority having jurisdiction.
- .5 Restrict public access to temporary or permanently abandoned stockpiles by means acceptable to provincial regulation.

**END OF SECTION**

**Part 1 General**

**1.1 RELATED SECTIONS**

- .1 Section 31 23 10 – Excavation Trenching and Backfill

**1.2 BASIS OF PAYMENT**

- .1 Payment for testing to be included in the tendered price of the work to which it is incorporated.
- .2 Payment for retesting required due to unsatisfactory results by Contractor.

**Part 2 Products**

**2.1 NOT USED**

- .1 Not Used.

**Part 3 Execution**

**3.1 GENERAL**

- .1 The requirements of Section 31 23 10 shall apply.

**3.2 MATERIAL TESTING**

- .1 Testing of material to be performed by an independent testing agency approved by the owner.
- .2 Supply representative samples of granular materials for gradation test.
- .3 Provide labour to obtain and handle samples at work site or at source of materials.

**3.3 COMPACTION TESTING**

- .1 Compaction tests to be performed by independent testing agency.
- .2 Testing to be performed throughout progress of work to determine adequacy of compaction.
- .3 Co-operate with inspection staff during testing period.

**END OF SECTION**

**Part 1 General**

**1.1 RELATED SECTIONS**

- .1 Section 01 33 00 - Submittal Procedures.
- .2 Section 01 56 00 - Temporary Barriers and Enclosures.
- .3 Section 31 05 10 - Corrected Maximum Dry Density.
- .4 Section 33 41 00 - Storm Utility Drains.

**1.2 MEASUREMENT PROCEDURES**

- .1 Common Excavation for this project is included in the separate works identified in these specifications.
- .2 Rock Excavation will be measured in cubic meters using the average end area method between cross sections taken after the rock is exposed and lines and elevations indicated. Boulders greater than one cubic meter will be classified as rock. Boulders removed from the excavation shall be measured along the three maximum perpendicular axes.
- .3 Unsuitable material will be measured in cubic meters using the average end area method of volume of unsuitable material between cross sections taken before and after excavation. Where approved by the Engineer, truck measure may be used in the event that the average end area method is unattainable.
- .4 Shoring, bracing, cofferdams, underpinning and de-watering of excavation will not be measured separately for payment.
- .5 Backfilling for this project is included in the separate works identified in these specifications.
- .6 Hydroseeding will be measure for payment in square metres.

**1.3 REFERENCES**

- .1 American Society for Testing and Materials International (ASTM)
  - .1 ASTM C117, Standard Test Method for Material Finer Than 0.075 mm (No.200) Sieve in Mineral Aggregates by Washing.
  - .2 ASTM C136, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
  - .3 ASTM D422-63, Standard Test Method for Particle-Size Analysis of Soils.
  - .4 ASTM D698, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft<sup>3</sup>) (600 kN-m/m<sup>3</sup>).
  - .5 ASTM D1557, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft<sup>3</sup>) (2,700 kN-m/m<sup>3</sup>).

- .6 ASTM D4318, Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.
- .2 Canadian General Standards Board (CGSB)
  - .1 CAN/CGSB-8.1, Sieves, Testing, Woven Wire, Inch Series.
  - .2 CAN/CGSB-8.2, Sieves, Testing, Woven Wire, Metric.
- .3 Canadian Standards Association (CSA International)
  - .1 CAN/CSA-A3000, Cementitious Materials Compendium (Consists of A3001, A3002, A3003, A3004 and A3005).
    - .1 CSA-A3001, Cementitious Materials for Use in Concrete.
  - .2 CAN/CSA-A23.1/A23.2, Concrete Materials and Methods of Concrete Construction/Methods of Test for Concrete.
- .4 Department of Justice Canada (Jus)
  - .1 Canadian Environmental Protection Act (CEPA), c. 33.
  - .2 Transportation of Dangerous Goods Act (TDGA), c. 34.
- .5 All references to be the latest edition.

#### 1.4 DEFINITIONS

- .1 Rock: material which requires drilling, blasting, ripping or breaking up with power-operated tools for its removal and boulders and pieces of concrete exceeding volume limits below. Frozen material will not be classified as rock.
  - .1 Trench Excavation:  $0.5\text{m}^3$
  - .2 Mass Excavation:  $1.0\text{m}^3$
- .2 Common: excavated soil which is not rock, unsuitable, or topsoil and free from stumps, trees, roots, sod, organics boulders and masonry larger than 200mm in any dimensions; and other deleterious materials.
- .3 Surplus material: excavated material not required for re-use
- .4 Unclassified excavation: excavation of deposits of whatever character encountered in Work.
- .5 Topsoil:
  - .1 Material capable of supporting good vegetative growth and suitable for use in top dressing, landscaping and seeding.
  - .2 Material reasonably free from subsoil, clay lumps, brush, objectionable weeds, and other litter, and free from cobbles, stumps, roots, and other objectionable material larger than 25 millimeters in any dimension.
- .6 Waste material or Unsuitable Material: excavated material unsuitable for use in Work or surplus to requirements.
- .7 Borrow material: material obtained from locations outside area to be graded, and required for construction of fill areas or for other portions of Work.



- .8 Recycled fill material: material, considered inert, obtained from alternate sources and engineered to meet requirements of fill areas.
- .9 Unsuitable materials:
  - .1 Weak, chemically unstable, and compressible materials.
  - .2 Frost susceptible materials:
    - .1 Fine grained soils with plasticity index less than 10 when tested to ASTM D4318, and gradation within limits specified when tested to ASTM D422 and ASTM C136: Sieve sizes to CAN/CGSB-8.1 CAN/CGSB-8.2.
    - .2 Table:

Sieve Designation	% Passing
2.00 mm	100
0.10 mm	45-100
0.02 mm	10-80
0.005 mm	0-45
    - .3 Coarse grained soils containing more than 20 % by mass passing 0.075 mm sieve.
- .10 Unshrinkable fill: very weak mixture of Portland cement, concrete aggregates and water that resists settlement when placed in utility trenches, and capable of being readily excavated.

## 1.5 SUBMITTALS

- .1 Make submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 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.
- .3 Samples:
  - .1 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.
  - .2 Inform Engineer at least 4 weeks prior to beginning Work, of proposed source of fill materials and provide access for sampling.
  - .3 Submit 70 kg samples of type of fill specified (including representative samples of excavated material)
  - .4 Deliver samples to Engineer in tightly closed containers to prevent contamination and exposure to elements.
  - .5 At least 4 weeks prior to beginning Work, inform Engineer source of fly ash and submit samples to Engineer.
    - .1 Do not change source of Fly Ash without written approval of Engineer.

## **1.6 QUALITY ASSURANCE**

- .1 Qualification Statement: submit proof of insurance coverage for professional liability.
- .2 Where Engineer is employee of Contractor, submit proof that Work by Engineer is included in Contractor's insurance coverage.
- .3 Submit design and supporting data at least 2 weeks prior to beginning Work.
- .4 Design and supporting data submitted to bear stamp and signature of qualified professional engineer registered or licensed in Province of Nova Scotia, Canada.
- .5 Keep design and supporting data on site.
- .6 Engage services of qualified professional Engineer who is registered or licensed in Province of Nova Scotia, Canada in which Work is to be carried out to design and inspect cofferdams, shoring, bracing and underpinning required for Work.
- .7 Do not use soil material until written report of soil test results are reviewed and approved by Engineer.
- .8 Health and Safety Requirements:
  - .1 Do construction occupational health and safety in accordance with applicable Nova Scotia Regulations.

## **1.7 DELIVERY, STORAGE AND HANDLING**

- .1 Storage and Protection:
  - .1 Protect existing features in accordance with Section 01 56 00 - Temporary Barriers and Enclosures and applicable local regulations.
  - .2 Existing buried utilities and structures:
    - .1 Size, depth and location of existing utilities and structures as indicated are for guidance only. Completeness and accuracy are not guaranteed.
    - .2 Prior to beginning excavation Work, notify Engineer and applicable utilities companies to establish location and state of use of buried utilities and structures.
    - .3 Confirm locations of buried utilities by careful test excavations and/or soil hydrovac methods.
    - .4 Maintain and protect from damage, water, sewer, gas, electric, telephone and other utilities and structures encountered.
    - .5 Record location of maintained and abandoned underground lines.
    - .6 Confirm locations of recent excavations adjacent to area of excavation.
  - .3 Existing buildings and surface features:
    - .1 Conduct, with Engineer, 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 Engineer.
- .2 Construction/Demolition Waste Management and Disposal:
  - .1 Separate waste materials for reuse and recycling in accordance with local regulations.
  - .2 Collect and separate for materials for disposal as required for recycling in accordance with local regulations.
  - .3 Place materials defined as hazardous or toxic in designated containers.
  - .4 Handle and dispose of hazardous materials in accordance with local regulations.
  - .5 Ensure emptied containers are sealed and stored safely.

## Part 2 Products

### 2.1 MATERIALS

- .1 Type 1 and Type 2 fill: To Nova Scotia Transportation and Infrastructure Renewal Specifications.
  - .1 Crushed, pit run or screened stone, gravel or sand.
  - .2 Gradations to be within limits specified when tested to ASTM C136 and ASTM C117 Sieve sizes to CAN/CGSB-8.1, CAN/CGSB-8.2.
  - .3 Table:

Sieve Designation	% Passing	Type 1	Type 2
80 mm	-		100
50 mm	-		70-100
28 mm			50-80
20 mm	100		-
14 mm	50-85		35-65
9.5 mm	50-100		-
4.75 mm	20-50		20-50
0.425 mm	10-25		5-30
0.160 mm	5-12		3-10
0.075 mm	3-8		0-7
- .2 Borrow: selected material from excavation or other sources, approved by Engineer for use intended, unfrozen and free from rocks larger than 75mm, cinders, ashes, sods, refuse or other deleterious materials.
- .3 Unshrinkable fill: proportioned and mixed to provide:
  - .1 Maximum compressive strength of 0.4 MPa at 28 days.
  - .2 Maximum Portland cement content of 25 kg/m<sup>3</sup> with 40% by volume fly ash replacement: to CSA-A3001, Type 10.
  - .3 Minimum strength of 0.07MPa at 24 h.

- .4 Concrete aggregates: to CAN/CSA-A23.1.
- .5 Portland cement: Type 10.
- .6 Slump: 160 to 200 mm.
- .4 Shearmat: honeycomb type bio-degradable cardboard 100 mm thick, treated to provide sufficient structural support for poured concrete until concrete cured.

### **Part 3 Execution**

#### **3.1 SITE PREPARATION**

- .1 Remove obstructions, ice and snow, from surfaces to be excavated within limits indicated.
- .2 Cut pavement or sidewalk neatly along limits of proposed excavation in order that surface may break evenly and cleanly.

#### **3.2 STRIPPING OF TOPSOIL**

- .1 Begin topsoil stripping of areas as indicated after area has been cleared and removed from site.
- .2 Strip topsoil to depths indicated. Do not mix topsoil with subsoil.
- .3 Stockpile in locations approved by Engineer. Stockpile height not to exceed 2 m and should be protected from erosion.
- .4 Dispose of unused topsoil off site.

#### **3.3 STOCKPILING**

- .1 Stockpile fill materials in areas approved by Engineer. 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. Erosion and Sediment Control are to meet the requirements of the Erosion and Sedimentation Control Handbook For Construction Sites produced by Nova Scotia Environment.

#### **3.4 COFFERDAMS, SHORING, BRACING AND UNDERPINNING**

- .1 Maintain sides and slopes of excavations in safe condition by appropriate methods and in accordance with provincial regulations.
- .2 Obtain copies of permits from Engineer for applicable details on temporary diversion of water course.
- .3 Construct temporary Works to depths, heights and locations as indicated and approved by Nova Scotia Environment.
- .4 During backfill operation:

- .1 Unless otherwise indicated or directed by Engineer, remove sheeting and shoring from excavations.
- .2 Do not remove bracing until backfilling has reached respective levels of such bracing.
- .3 Pull sheeting in increments that will ensure compacted backfill is maintained at elevation at least 500mm above toe of sheeting.
- .5 When sheeting is required to remain in place, cut off tops at elevations as indicated.
- .6 Upon completion of substructure construction:
  - .1 Remove cofferdams, shoring and bracing.
  - .2 Remove excess materials from site and restore watercourses as indicated and approved by Nova Scotia Environment.

### **3.5 DEWATERING AND HEAVE PREVENTION**

- .1 Keep excavations free of water while Work is in progress.
- .2 Submit for Engineer's review and approval, details of proposed dewatering or heave prevention 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 provincial regulations and in a 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.

### **3.6 EXCAVATION**

- .1 Advise Engineer at least 7 days in advance of excavation operations for initial cross sections to be taken.
- .2 Excavate to lines, grades, elevations and dimensions as indicated..
- .3 Excavation must not interfere with bearing capacity of adjacent foundations.
- .4 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.

- .5 For trench excavation, unless otherwise authorized by Engineer in writing, do not excavate more than 30 m of trench in advance of installation operations and do not leave open more than 15m at end of day's operation.
- .6 Keep excavated and stockpiled materials safe distance away from edge of trench in accordance with provincial regulations
- .7 Restrict vehicle operations directly adjacent to open trenches.
- .8 Dispose of surplus and unsuitable excavated material off site.
- .9 Do not obstruct flow of surface drainage or natural watercourses.
- .10 Earth bottoms of excavations to be undisturbed soil, level, free from loose, soft or organic matter.
- .11 Remove unsuitable material from trench bottom including those that extend below required elevations to extent and depth as directed by Engineer.
- .12 Correct unauthorized over-excavation as follows:
  - .1 Fill under bearing surfaces and footings with approved fill as identified in the project drawings.
  - .2 Fill under other areas with Type 2 fill compacted to not less than 95 % of corrected Standard Proctor maximum dry density in accordance with Section 31 05 10 - Corrected Maximum Dry density fir Fill.
- .13 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 Clean out rock seams and fill with concrete mortar or grout to approval of Engineer.

### **3.7 FILL TYPES AND COMPACTION**

- .1 Use types of fill as indicated on project drawings.

### **3.8 BEDDING AND SURROUND OF UNDERGROUND SERVICES**

- .1 Place and compact granular material for bedding and surround of underground services as indicated.
- .2 Place bedding and surround material in unfrozen condition.

### **3.9 BACKFILLING**

- .1 Do not proceed with backfilling operations until completion of following:
  - .1 Engineer has inspected and approved installations.
  - .2 Engineer has inspected and approved of construction below finish grade.
  - .3 Inspection, testing, approval, and recording location of underground utilities.
  - .4 Removal of concrete formwork.

- .5 Removal of shoring and bracing; backfilling of voids with satisfactory soil material.
- .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 uniform layers not exceeding 200 mm compacted thickness up to grades indicated. Compact each layer before placing succeeding layer.
- .5 Backfilling around installations.
  - .1 Place bedding and surround material as specified elsewhere.
  - .2 Do not backfill around or over cast-in-place concrete within 30 days after placing of concrete, unless approved by Engineer.
  - .3 Place layers simultaneously on both sides of installed Work to equalize loading.
  - .4 Where temporary unbalanced earth pressures are liable to develop on walls or other structures:
    - .1 Permit concrete to cure for minimum 30 days or until it has sufficient strength to withstand earth and compaction pressure and approval obtained from Engineer.
    - .2 If approved by Engineer, erect bracing or shoring to counteract unbalance, and leave in place until removal is approved by Engineer.
- .6 Place fill in areas as indicated.
- .7 Consolidate and level unshrinkable fill with internal vibrators.
- .8 Install drainage system in backfill as indicated.

### **3.10 RESTORATION**

- .1 Upon completion of Work, remove waste materials and debris in accordance to local applicable regulations.
- .2 Replace topsoil as indicated.
- .3 Reinstate lawns to elevation which existed before excavation.
- .4 Reinstate pavements and sidewalks disturbed by excavation to thickness, structure and elevation which existed before excavation.
- .5 Clean and reinstate areas affected by Work as directed by Engineer.
- .6 Use temporary plating to support traffic loads over unshrinkable fill for initial 24 hours.
- .7 Protect newly graded areas from traffic and erosion and maintain free of trash or debris.

**END OF SECTION**