Part 1 General

1.1 RELATED SECTIONS

.1 Section 07 21 13 - Board Insulation: perimeter foundation insulation and frost barrier.

1.2 REFERENCES

.1 American Society for Testing and Materials (ASTM)
  .1 ASTM D698, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft3 (600 kN-m/m3))

1.3 DEFINITIONS

.1 Excavation classes: two classes of excavation will be recognized; common excavation and rock excavation.
  .1 Rock : any solid material in excess of 0.25 m n and which cannot be removed by means of heavy duty mechanical excavating equipment with 0.95 to 1.15 m^3 bucket. Frozen material not classified as rock.
  .2 Common excavation: excavation of materials of whatever nature, which are not included under definitions of rock excavation.

.2 Unclassified excavation: excavation of deposits of whatever character encountered in Work.

.3 Waste material: excavated material unsuitable for use in Work or surplus to requirements.

.4 Borrow material: material obtained from locations outside area to be graded, and required for construction of fill areas or for other portions of Work.

.5 Unsuitable materials:
  .1 Weak and compressible materials under excavated areas.
  .2 Frost susceptible materials under excavated areas.
  .3 Organic material under slabs and bearing surfaces.

1.4 SAMPLES

.1 Submit samples in accordance with E4.

.2 At least 4 weeks prior to commencing work inform Contract Administrator of proposed source of fill materials and provide access for sampling.

.3 Submit 20 kg samples of granular fill materials specified including representative samples of excavated material. In case of coarse gravelly soil or coarse crushed stone submit 70 kg samples.

.4 Ship samples prepaid to testing agency clearly marked in tightly closed containers to prevent contamination.

1.5 PROTECTION OF EXISTING FEATURES

.1 Protect existing features in accordance applicable local regulations.

.2 Existing 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 commencing any excavation work, notify applicable utility or City, establish location and state of use of buried utilities. Utility having jurisdiction to clearly mark such locations to prevent disturbance during Work.

.3 Confirm locations of buried utilities by careful test excavations.

.4 Maintain and protect from damage, water, sewer, gas, electric, telephone and other utilities encountered.

.5 Where utility lines or structures exist in area of excavation, Obtain direction of Contract Administrator before moving or re-routing or otherwise disturbing utilities or structures.

.6 Record locations of maintained, re-routed, abandoned underground utility lines.

.7 Confirm locations of recent excavations adjacent to area of excavation.

.3 Existing buildings and surface features:

.1 Conduct, with Contract Administrator, condition survey of existing buildings, trees and other plants, lawns, fencing, service poles, wires, paving, 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 to approval of Contract Administrator.

.3 Provide adequate protection around bench markers, layout markers, survey markers and geodesic monuments.

.4 Protect bottoms of excavations from softening. Should softening occur, remove softened soil and replace with compacted low density concrete fill to satisfaction of Contract Administrator.

.5 Protect bottoms of excavations from freezing.

.6 Effect approved methods to minimize dust as a result of this work.

1.6 EXISTING CONDITIONS

.1 A sub-surface soils investigation report of the site has been prepared and is available for viewing at the offices of the Contract Administrator.

.2 The report indicated properties of soils and by its nature cannot reveal all conditions that exist or can occur on the site and is provided for general information only.

.3 The Contractor and Subcontractors are responsible for assuring themselves of the actual site and sub-surface soil conditions.

1.7 COMPACTION DENSITIES

.1 Compaction densities are percentages of maximum densities obtained from ASTM D698 Standard Proctor Dry Density.

Part 2 Products

2.1 FILL MATERIALS

.1 Granular fill: crushed, pit run or screened stone, gravel or sand consisting of hard durable particles free from clay lumps, cementation, organic material, frozen material and other deleterious substances, and graded within the Manitoba Department of Highways 2002 Aggregate Grading Specification:

Passing Sieve Size		Type A (base course 'A')		Type C (base course 'C')	
Metric	Imp.	Granular	Crushed Stone	Granular	Crushed Stone
37.5 mm	1½"			100%	
25 mm	1"			85-100%	100%
19 mm	3/4"	100%	100%		
16 mm	5/8"	80-100%			
4.75 mm	No.4	40-70%	35-70%	25-80%	25-80%
2 mm	No.10	25-55%			
425 µm	No.40	15-30%	15-30%	15-40%	
75 µm	No. 200	8-15%	8-17%	8-18%	8-20%
Min. Crush Count		35%	100%	15%	100%
Maximum Los Angeles Abrasion Loss		35%	35%	40%	40%
Maximum Shale Content		12%		20%	
Maximum Clay Balls		10%			

.2 Earth Fill: selected earth material from excavation or other sources, approved by Contract Administrator for use intended, unfrozen and free from rocks larger than 76 mm (3"), cinder, ash, sods, refuse or other deleterious materials.

.3 Sand: clean, washed, course sand free from clay, shale and organic matter.

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 Do not use topsoil stripped from site for finish grading or landscaping work. Remove from site.

3.3 STOCKPILING

.1 Stockpile fill materials in areas designated by Contractor. Stockpile granular materials in manner to prevent segregation.

.2 Protect fill materials from contamination.

.3 Do not stockpile material on completed pavement where damage to pavement may occur.

3.4 DEWATERING AND HEAVE PREVENTION

.1 Keep excavations free of water while work is in progress.

.2 Avoid excavation below groundwater table if quick condition or heave is likely to occur. Prevent piping or bottom heave of excavations by groundwater lowering, sheet pile cut-offs, or other means.

.3 Protect open excavations against flooding and damage due to surface run-off.

.4 Dispose of water in manner not detrimental to public and private property, or any portion of Work completed or under construction.

3.5 EXCAVATION

.1 Excavate to lines, grades, elevations and dimensions indicated for installation, construction and inspection of work specified.

.2 Excavate to well defined lines to minimize quantity of fill material required.

.3 Remove concrete, masonry, paving, walks, and other obstructions encountered during excavation.

.4 Excavation must not interfere with normal 45° splay of bearing from bottom of any footing.

.5 Dispose of surplus and unsuitable excavated material off site.

.6 Do not obstruct flow of surface drainage.

.7 Earth bottoms of excavations to be dry undisturbed soil, level, free from loose, soft or organic matter. Notify Contract Administrator when soil at bottom of excavation appears unsuitable and proceed as directed by Contract Administrator.

.8 If frozen material is encountered during excavation remove frozen material before installation of any foundations.

.9 Correct unauthorized excavation at no extra cost as follows:
- .1 Fill under bearing surfaces and footings with concrete specified for footings.
- .2 Fill under non-bearing surfaces with earth fill compacted to 95% density.

.10 Hand trim, make firm and remove loose material and debris from excavations. Where material at bottom of excavation is disturbed, compact foundation soil to density at least equal to undisturbed soil.

.11 Upon completion of excavation notify Contract Administrator for review and verification of soil bearing capacity, depths, and dimensions.

3.6 FILL TYPES AND COMPACTION

.1 Compaction densities are percentages of maximum densities obtained from ASTM D698 – Standard Proctor Dry Density. Dimensions specified herein are minimum dimensions after compaction.

.2 Use fill types indicated or specified below.

.3 Exterior side of perimeter foundation walls and grade beams:
- .1 Where slabs-on-grade are adjacent to building: use Type A granular fill to sub-grade level; compact to 98% density.
- .2 Where landscaped areas are adjacent to building: use Type A granular fill to sub-grade level; compact to 95% density. Cap with 300 mm clay fill extending out minimum 1 m from building; compact to 95% density. Sloped clay cap away from building for positive drainage.

.4 Under structurally supported concrete slabs: use earth fill to underside of void form. Compact to 98% density.

.5 Under slabs-on-grade (sidewalks): provide minimum 150 mm thickness of Type A granular fill to underside of slab; compact to 95% density.

3.7 BACKFILLING

.1 Do not proceed with backfilling operations until Contract Administrator has reviewed installations and work that backfilling will conceal.

.2 Areas to be backfilled to be free from debris, snow, ice, water or frozen ground.

.3 Do not use backfill material that is frozen or contains ice, snow or debris.

.4 Prior to placing fill under slabs on grade compact existing subgrade to obtain same compaction as specified for fill. Remove soft and unsuitable material and fill with acceptable material.

.5 Do not backfill around or over cast-in-place concrete until concrete has fully cured and backfilling operations have been reviewed by Contract Administrator.

.6 Place backfill material in uniform layers not exceeding 150 mm loose thickness. Compact each layer before placing succeeding layer.

.7 Backfill simultaneously on both sides of walls, grade beams, piles and other installations to equalize loading. Difference not to exceed 1000 mm.

.8 Place materials under, around and over installations until 600 mm cover is provided. Do not dump or place material directly on installations.

.9 Where temporary unbalanced earth pressures are liable to develop on walls or other structures:
- .1 Permit concrete to cure until it has sufficient strength to withstand earth and compaction pressure; or
- .2 If acceptable to Contract Administrator, erect bracing or shoring to counteract unbalance, and leave in place until removal is authorized by Contract Administrator.

.10 Use methods to prevent disturbing or damage to foundations, piles, buried services, drainage system or other installations that backfilling will conceal. Notify Contract Administrator of any damage and make good at no additional cost to Contract.

3.8 RESTORATION

.1 Upon completion of work, remove surplus materials and debris, trim slopes, and correct defects noted by Contract Administrator. Dispose of surplus or unsuitable material from site.

.2 Clean and reinstate areas affected by work as directed by Contract Administrator.

3.9 SURPLUS MATERIAL

.1 Remove surplus material and material unsuitable for fill, grading or landscaping off site.

3.10 INSPECTION AND TESTING

.1 Testing of fill materials and compaction will be carried out by an independent testing agency appointed by the City under separate contract.

.2 If, during progress of work, tests indicate fills and compaction do not meet specified requirements, remove defective fills, replace, compact and retest at no extra cost to the Contract.

END OF SECTION