

Part 1 General

1.1 SECTION INCLUDES

- .1 This Section specifies fill materials, clearing and grubbing, excavation, backfilling, and grading.

1.2 RELATED SECTIONS

- .1 Section 03 30 00 – Cast-in-Place Concrete.

1.3 REFERENCES

- .1 American Society for Testing and Materials International (ASTM)
 - .1 ASTM D698-07e1, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400ft lbf/ft³) (600kN m/m³).
 - .2 City of Winnipeg Standard Construction Specifications
 - .1 CW 3110 – Sub-Grade, Sub-Base and Base Course Construction.

1.4 MEASUREMENT PROCEDURES

- .1 No measurement will be made for work under this Section.

1.5 SUBMITTALS

- .1 Provide submittals as required by Contract Administrator.
 - .1 Submit to designated testing agency, 23 kg sample of backfill for fill material proposed for use, no later than two (2) weeks before backfilling or filling work.

1.6 EXISTING CONDITIONS

- .1 Examine soil report available at the Contract Administrators office.

Part 2 Products

2.1 MATERIALS

- .1 Sub-Base Materials: to CW3110 - Sub-Grade, Sub-Base and Base Course Construction.
 - .1 Sub-base material of the type(s) shown on the Drawings or indicated in the Specifications will be supplied in accordance with the following requirements:
 - .2 Suitable site sub-base material will be of a type approved Contract Administrator.
 - .3 Clay borrow sub-base material will be of a type approved Contract Administrator.
 - .4 Crushed sub-base material will be well-graded and conform to the following grading requirements:

Crushed Sub-Base Material Grading Requirements

Canadian Metric Sieve Size	Percent of Total Dry Weight Passing Each Sieve	
	50 mm MAX. AGG.	150 mm MAX. AGG.
150 000		90% - 100%*
100 000		75% - 90%
50 000	100%	
25 000		50% max.
5 000	25% - 80%	
80	5% - 18%	

* The maximum allowable size is 300 mm.

- .1 Base Course Material: to CW31 10-Sub-Grade, Sub-Base and Base Course Construction.
 - .1 Base course material will be approved by Contract Administrator.
 - .2 Base course material will consist of sound, hard, crushed rock or crushed gravel and will be free from organic or soft material that would disintegrate through decay or weathering.
 - .3 The base course material will be well graded and conform to the following grading requirements:

Base Course Material Grading Requirements

Canadian Metric Sieve Size	Percent of Total Dry Weight Passing Each Sieve	
	Granular	Crushed Limestone
25 000	100%	
20 000	80% - 100%	100%
5 000	40% - 70%	40% - 70%
2 500	25% - 55%	25% - 60%
315	13% - 30%	8% - 25%
80	5% - 15%	6% - 17%

Part 3 Execution

3.1 PREPARATION/PROTECTION

- .1 Protect excavations from freezing.
- .2 Keep excavations clean, free of standing water, and loose soil.
- .3 Protect buried services that are required to remain undisturbed.
- .4 Where soil is subject to significant volume change due to change in moisture content, cover and protect to Contract Administrator approval.
- .5 Protect natural and manmade features required to remain undisturbed. Unless otherwise indicated or located in an area to be occupied by new construction, protect existing trees from damage.
- .6 Protect benchmarks and existing structures, roads, sidewalks, paving, and curbs against damage from construction traffic.
- .7 Notify Contract Administrator of any unexpected subsurface conditions. Discontinue work in the area until Contract Administrator provides notification to resume work.
- .8 Utilities and Buried services:
 - .1 Before commencing work verify location of buried services on and adjacent to site.
 - .2 Arrange with Contract Administrator for relocation of buried services that interfere with execution of work: pay costs of relocating services.
 - .3 Notify Contract Administrator to remove and/or relocate lines which are in the way of earthwork.
 - .4 Protect utility services uncovered by excavation

3.2 CLEARING OF EXCAVATED MATERIAL

- .1 Dispose of cleared, excavated and grubbed material off site daily to disposal areas acceptable to authority having jurisdiction.

3.3 EXCAVATION

- .1 Excavate as required to carry out work.
 - .1 Excavate in accordance with lines and levels required to erect formwork.
 - .2 Do not disturb soil or rock below bearing surfaces.
 - .3 Notify Contract Administrator when excavations are complete.
 - .4 If bearings are unsatisfactory, additional excavation will be authorized in writing and paid for as additional work. Excavation taken below depths shown without Contract Administrator written authorization to be filled with concrete of same strength as for footings at Contractor's expense.
 - .5 Excavations are not to interfere with normal 45 degree bearing splay of any foundation.
 - .6 Remove excess or unsuitable excavated subsoil from site.
 - .7 Removal of boulders or buried rock in excess of 0.5 cu.m. will be authorized in writing and paid for as additional work. All other work is deemed to be within the scope of this Section.
- .2 Excavate for slabs and paving to subgrade levels.
 - .1 In addition, remove all topsoil, organic matter, debris and other loose and harmful matter encountered at subgrade level.

3.4 DEWATERING

- .1 Keep excavations dry at all times. Provide necessary equipment including pumps, piping and temporary drains and trenches.
- .2 Discharge drainage water lines in manner and location acceptable to Contract Administrator
- .3 Direct surface drainage away from excavated areas.
- .4 Control the grading in and adjacent to excavations to prevent water running into excavated areas.
- .5 Furnish and operate suitable pumps on a 24-hour basis to keep excavations free of water until foundations have been placed.

3.5 BACKFILLING

- .1 Inspection: Do not commence backfilling until fill material and spaces to be filled have been inspected and approved by the Contract Administrator.
- .2 Remove snow, ice, construction debris, organic soil and standing water from spaces to be filled.
- .3 Compaction of subgrade: compact existing subgrade under slabs-on-grade, to same compaction as specified for fill.
 - .1 Fill excavated areas with selected subgrade material compacted as specified for fill.
- .4 Placing: Place backfill, fill and base course material in 150 mm lifts: add water as required to achieve specified density.
- .5 Backfill areas to grades, contours, levels and elevations indicated on Drawings.
- .6 Perform backfilling operations systematically and as early as possible to allow maximum time for natural settlement and compaction.
- .7 Compaction: compact each layer of material to following densities for material to ASTM D698: 95% Modified Proctor Density.

3.6 GRADING

- .1 Grade so that water will drain away from buildings, walls and paved areas, to catch basins and other disposal areas approved by the Contract Administrator.
- .2 Grade to be gradual between finished spot elevations shown on drawings.

3.7 FIELD QUALITY CONTROL

- .1 Testing of materials and compaction of backfill and fill will be carried out by testing laboratory designated by the Contract Administrator.
- .2 Not later than two (2) weeks before backfilling or filling, provide to designated testing agency, samples of backfill as described in Part 1 - Submittals.
- .3 Do not begin backfilling or filling operations until material has been approved for use by the Contract Administrator.
- .4 Not later than 48 hours before backfilling or filling with approved material, notify the Contract Administrator so that compaction tests can be carried out by designated testing agency.

3.8 SHORTAGE AND SURPLUS

- .1 Supply necessary fill to meet backfilling and grading requirements and with minimum and maximum rough grade variance.
- .2 Dispose of surplus material off site.

3.9 CLEANING

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

END OF SECTION