

**Part 1            General**

**1.1                MEASUREMENT PROCEDURES**

- .1        Work performed under this section will be incidental to work involved in other sections.
- .2        Shoring, bracing, cofferdams, underpinning and de-watering of excavation will not be measured separately for payment.

**1.2                DEFINITIONS**

- .1        Excavation classes: two classes of excavation will be recognized; common excavation and rock excavation.
  - .1        Rock : solid material in excess of 1.00 m<sup>3</sup> and which cannot be removed by means of heavy duty mechanical excavating equipment with 0.95 to 1.15 m<sup>3</sup> 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        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.
- .4        Waste material: excavated material unsuitable for use in Work or surplus to requirements.
- .5        Borrow material: material obtained from locations outside area to be graded, and required for construction of fill areas or for other portions of Work.
- .6        Recycled fill material: material, considered inert, obtained from alternate sources and engineered to meet requirements of fill areas.
- .7        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 D 4318, and gradation within limits specified when tested to ASTM D 422 and ASTM C 136: Sieve sizes to CAN/CGSB-8.1 CAN/CGSB-8.2.
    - .2        Table:

<u>Sieve Designation</u>	<u>% Passing</u>
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.
- .8 Unshrinkable fill: very weak mixture of cement, concrete aggregates and water that resists settlement when placed in utility trenches, and capable of being readily excavated.

### **1.3 ACTION AND INFORMATIONAL SUBMITTALS**

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

### **1.4 EXISTING CONDITIONS**

- .1 Buried services:
  - .1 Before commencing work verify location of buried services on and adjacent to site.
  - .2 Prior to beginning excavation Work, notify applicable Departmental Representative, establish location and state of use of buried utilities and structures. Authorities having jurisdiction to clearly mark such locations to prevent disturbance during Work.
  - .3 Confirm locations of buried utilities by careful soil hydrovac methods where proximate to proposed excavations and post installations.
  - .4 Maintain and protect from damage, water, sewer, gas, electric, telephone and other utilities and structures proximate to proposed excavations and post installations.
  - .5 Where utility lines or structures exist in area of excavation, obtain direction of Departmental Representative before removing or re-routing. Costs for such Work to be incidental.
  - .6 Record location of maintained, re-routed and abandoned underground lines.
  - .7 Confirm locations of recent excavations adjacent to area of excavation.
- .2 Existing buildings and surface features:
  - .1 Conduct, with Departmental Representative condition survey of existing pavements, buildings, trees and other plants, fencing, service poles, wires, 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.

## **Part 2 Products**

### **2.1 MATERIALS**

- .1 Type 1: properties to meet the following requirements:
  - .1 Crushed stone, gravel and sand.
  - .2 Gradations to be within limits specified when tested to ASTM C 136 and ASTM C 117. Sieve sizes to CAN/CGSB-8.1.

Sieve Designation	% Passing
	<u>Type 1</u>
25 mm	100
20 mm	82-97
16 mm	70-94
10 mm	52-79
5 mm	35-64
1.25 mm	18-43
0.630 mm	12-34
0.315 mm	8-26
0.160 mm	5-18
0.08 mm	2-10

Type 1 = Designation 2, Class 25 mm Alberta Transportation Specification

### **Part 3 Execution**

#### **3.1 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 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.

#### **3.2 SITE PREPARATION**

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

#### **3.3 PREPARATION/ PROTECTION**

- .1 Protect existing features in accordance with Section 01 56 00 - Temporary Barriers and Enclosures and applicable local regulations.
- .2 Where applicable, 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. All utility lines encountered during excavation must be backfilled in accordance with utility backfill trench detail as shown in the drawings.

### **3.4 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.

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

- .1 Designs of these temporary works, if required, need to be completed by and approved by a Professional Engineer.
- .2 Maintain sides and slopes of excavations in safe condition by appropriate methods and in accordance with Section 01 35 29.06 - Health and Safety Requirements.
  - .1 Where conditions are unstable, Departmental Representative to verify and advise methods.
- .3 Construct temporary Works to depths, heights and locations as approved by Departmental Representative.
- .4 During backfill operation:
  - .1 Unless otherwise indicated or directed by Departmental Representative, 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 500 mm 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 by Departmental Representative.

### **3.6 EXCAVATION**

- .1 Advise Departmental Representative at least 7 days in advance of excavation operations for initial cross sections to be taken.
- .2 Guard rail and sign post excavations to be carried out from the road surface to minimize environmental impacts.
- .3 Subsurface soils are expected to include rocky conditions in places. Any costs associated with alternative post excavation methods, such as diamond drilling, over-excavation, or any other means required to achieve target excavation dimensions are incidental to this project, and no separate payment consideration will be made.

- .4 Excavation must not interfere with bearing capacity of adjacent foundations, pavement, or facilities.
- .5 Keep excavated and stockpiled materials safe distance away from edge of excavations.
- .6 Restrict vehicle operations directly adjacent to open excavations.
- .7 Dispose of surplus and unsuitable excavated material outside of Waterton Lakes National Park.
- .8 Do not obstruct flow of surface drainage or natural watercourses.
- .9 Earth bottoms of excavations to be undisturbed soil, level, free from loose, soft or organic matter.
- .10 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.
- .11 Rocks 0.6 m<sup>3</sup> up to 1 m<sup>3</sup> to be salvaged and stockpiled at Upper Parks Compound.

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

- .1 Use types of fill as indicated or specified below.
  - .1 Surrounding posts and on shoulders use Type 1 fill material for backfill, compact to 98 percent of maximum Proctor dry density to ASTM D698.

### **3.8 BACKFILLING**

- .1 Do not proceed with backfilling operations until completion of following:
  - .1 Departmental Representative has inspected and approved installations.
- .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 150 mm compacted thickness up to grades indicated. Compact each layer to 98% standard Proctor maximum dry density 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 24 hours after placing of concrete.
  - .3 Place layers simultaneously on both sides of installed Work to equalize loading.

### **3.9 RESTORATION**

- .1 Upon completion of Work, remove waste materials and debris, trim slopes, and correct defects.
- .2 Reinstate pavements and sidewalks disturbed by excavation to thickness, structure and elevation which existed before excavation.
- .3 Clean and reinstate areas affected by Work.
- .4 Protect newly graded areas from traffic and erosion and maintain free of trash or debris.

**END OF SECTION**