

**PART 1 GENERAL**

**1.1 Related Sections**

- .1 Section 01 33 00 - Submittal Procedure.
- .2 Section 01 56 00 - Temporary Barriers and Enclosures.
- .3 Section 01 35 29.06 - Health and Safety Requirements.
- .4 Section 31 23 33.01 - Excavating, Trenching and Backfilling.

**1.2 Definition**

- .1 Rock: any solid material in excess of  $1.0\text{m}^3$  and which cannot be removed by means of mechanical excavating equipment having  $0.95$  to  $1.15\text{m}^3$  bucket. Frozen material not classified as rock.
- .2 PPV: peal particle velocity.

**1.3 Measurement Procedures**

- .1 Mass rock:
  - .1 Rock quantities will be taken from cross section showing original rock surface and actual grade line set by Departmental Representative, except that minimum depth or rock required to excavated to be considered as 300 mm.
  - .2 Excavated rock will be measured in cubic meters (CMPM) in its original position.
  - .3 Volume of individual boulders and rock fragments will be determined by measuring three maximum mutually perpendicular dimensions.
- .3 Replacement imported fill: Imported fill quantities will be measured in cubic metres, compacted in place (CMPM).
- .4 Contractors shall provide all survey equipment needed and provide assistance to Departmental Representative in taking cross sections. Sections shall be taken at 5 m intervals for mass excavation. Sections will be submitted to contractor's site representative for verification. Additional sections shall be taken at points or significant change in elevation or at any other locations as determined by Departmental Representative. Contractor to schedule work to allow sufficient time for Departmental Representative to take necessary sections.

**1.4 Submittals**

- .1 Blasting Operation

- .1 Submit to Departmental Representative and local authorities having jurisdiction for approval, written proposal of operations for removal of rock by blasting.
- .2 Indicate proposed method of carrying out work, types and quantities of explosives to be used, loading charts and drill hole patterns, type of caps, blasting techniques, blast protection measures for items such as flying rock, vibration, dust and noise control. Include details on protective measures, time of blasting and other pertinent details.
- .3 Submit records to Departmental Representative at end of each shift. Maintain complete and accurate records for drilling and blasting operations.
- .4 Prior to any blasting operations, the contractor shall carry out a pre-blast survey. This survey will be conducted by an independent agency. The survey report will be submitted to the Departmental Representative for review.
- .5 No blasting shall take place without a minimum of 48 hours notice to the Departmental Representative.

#### **1.5 Qualifications**

- .1 Retain licensed explosives expert to program and supervise blasting work, to interpret recommendations of pre-blasting report, and to determine precautions, preparation and operations techniques.

#### **1.6 Blasting And Vibration Control**

- .1 Reduce ground vibrations to avoid damage to structures or remaining rock mass.

### **PART 2 PRODUCTS (NOT APPLICABLE)**

### **PART 3 EXECUTION**

#### **3.1 Protection**

- .1 Prevent damage to surroundings and injury to persons in accordance with Section 01 56 00 - Temporary Barriers and Enclosures. Sound warnings and display signs when blasting to take place.

#### **3.2 Rock Removal**

- .1 Co-ordinate this Section with Section 01 35 29.06 - Health and Safety Requirements.
- .2 Remove rock to alignments, profiles, and cross sections as indicated.
- .3 Explosive blasting is not permitted at locations indicated.
- .4 Do blasting operations in accordance with local and provincial codes, requirements of authority having jurisdiction.

- .5 Use rock removal procedures to produce uniform and stable excavation surfaces. Minimize overbreak, and to avoid damage to adjacent structures.
- .6 Excavate rock to horizontal surfaces.
- .7 Scale, pressure wash and broom clean rock surfaces which are to bond to concrete.
- .8 Excavate trenches to lines and grades to minimum of 300 mm below pipe invert indicated. Provide recesses for bell and spigot pipe to ensure bearing will occur uniformly along barrel of pipe.
- .9 Cut trenches to widths as indicated.
- .10 Use pre-shearing, cushion blasting or other smooth wall drilling and blasting techniques directed by Departmental Representative.
- .11 Remove boulders and fragments which may slide or roll into excavated areas.
- .12 Correct unauthorized rock removal at no extra cost, in accordance with Section 31 23 33.01 - Excavating, Trenching and Backfilling.

### **3.3 Rock Disposal**

- .1 Dispose of surplus removed rock off site. Dispose in locations acceptable to authorities having jurisdiction and Departmental Representative.
- .2 Do not dispose removed rock into landfill. Material must be sent to appropriate location as approved by the Departmental Representative.

**END OF SECTION**