



## **2300 - SPECIFICATION FOR EMBANKMENTS**

### **2300 - 1 DESCRIPTION**

- 1.01 The work shall consist of embankments and miscellaneous backfills constructed with excavated materials to the lines, grades, and dimensions shown on the plans, or as designated by the Engineer. Miscellaneous backfills will include backfill for the culvert excavations, subcuts, existing dugouts, disposal pits, and bridges.
- 1.02 Embankments will be classified on the tender form as one of the following:
- Earth embankment, density not specified
  - Earth embankment, density specified
  - Rock embankment

### **2300 - 2 MATERIALS**

#### **2.01 Earth Embankment**

The materials will consist of acceptable earth material and rock material free from objectionable quantities of organic matter, frozen soil, stumps, trees, moss, and other unsuitable materials.

#### **2.02 Rock Embankment**

The material will consist of fragmentary rock produced by drilling and blasting operations, and boulders which cannot be placed in layers as specified for Earth Embankments.

### **2300 - 3 CONSTRUCTION**

#### **Earth Embankment**

- 3.01 If a dugout is to be backfilled, the Contractor shall be required to pump water from the dugout at no direct expense to the Department.
- 3.02 Unclassified rubbish, shrubs, and vegetation that can be cut with a brush scythe or mowing machine shall be removed and disposed of from areas under embankments where the fill is to be less than 120 centimetres in height, unless stripping of unsuitable material from areas under embankments is specified. This work shall be completed at least two kilometres ahead of the earthmoving operation.
- 3.03 Grass, vegetation, and other unsuitable materials shall be removed from the existing embankment slopes before raising or widening the embankment.

- 3.04 The embankment shall be constructed by placing the material in successive layers distributed according to whichever of the following is applicable:
- At levels where suitable material is placed, the full width of the embankment.
  - At levels where unsuitable material is being placed, the full width of each segment of the unsuitable material, and the full width of the central core of suitable material.
  - The depth of each layer shall not be more than 15 centimetres uncompacted. The full width of each segment of each layer shall be bladed with a motor grader at least twice prior to being compacted except that the Engineer may approve the use of a bulldozer. The Contractor shall ensure that there will be no intermixing of the unsuitable and suitable material.
- 3.05 The slopes and surface of the embankment shall be shaped and trimmed to a uniform smooth surface conforming to the cross-sections shown on the plans, or as staked by the Engineer.
- 3.06 Stones having a dimension of eight centimetres or more when measured in any direction shall be excluded from the top 15 centimetres of the subgrade. If a clay cap or select subgrade course is required, the 15 centimetre dimension shall be reduced by the designated thickness of the applicable course.
- 3.07 Organic soils, subject to the approval of the Engineer may be used in the construction of farm approaches, ditch blocks , medians, and beneath the side slopes of embankments.
- 3.08 The following requirements will apply for all embankments except farm approaches and ditch blocks:
- (a) When unsuitable material is encountered below the natural ground surface in embankment areas, the material shall be excavated and disposed of as indicated on the plans, the special provisions, or as designated by the Engineer.
  - (b) If embankments are to be constructed over marshes, muskegs, or other excessively wet materials, the construction procedures shall be indicated on the plans, the special provisions, or as designated by the Engineer.
  - (c) If a density requirement for earth embankments is not specified on the tender form and the material on the embankment surface has insufficient moisture to produce a stable surface as determined by the Engineer, water shall be added in quantities as directed by the Engineer. The water shall be distributed in accordance with the requirements for Watering (Specification 2500).
  - (d) If a density requirement for earth excavation is specified on the tender form, each layer of the top 60 centimetres of the highway subgrade shall be dried to at least the optimum moisture content and compacted to an average of not less than 100 percent of the maximum density as determined by Test 9200.
    - (i) The foregoing requirements will also apply to backfill for subcuts and the embankment required to prepare the beds and backfill drainage structures.

- (ii) The Engineer will determine from the test results the section of embankment to be considered for evaluation. The moisture and density on this section will be considered satisfactory when:
  - All individual moisture test results are equal to or less than the optimum moisture content.
  - Density test results average not less than 100 percent of the maximum density.
  - All individual density tests are greater than 98 percent of the maximum density.
- (iii) If the moisture existing in the soil is insufficient for compacting to the specified density and for finishing, the Contractor may elect to add water. The water shall be added in accordance with the requirements for Watering (Specification 2500).
- (iv) In the remaining portion of the embankment no density or moisture content is specified; however, the Contractor will be required to spread the material in even lifts as specified. The Engineer may designate that drying and/or compaction be done on an Extra Work basis.

### **Rock Excavation**

- 3.09 The material shall be placed in the embankment by end dumping or dozing over the advance face of the fill. The embankment shall be constructed to full width and true to cross-section as the work progresses. No dumping over the side slopes of the embankment will be permitted. The vertical dimension of any rock in place in the embankment shall not be greater than one-third of the depth of the fill in which the material is placed.
- 3.10 Rock embankments placed on a stable base shall be constructed so that the centre of the advancing face of the embankment is behind the advance of the shoulders.
- 3.11 Rock embankments placed on an unstable base shall be constructed so that the centre of the advancing face of the embankment fill is out in advance of the shoulders. Slopes shall be constructed to the natural angle of repose.
- 3.12 Voids in the top of the embankment shall be chocked with small rock fragments when the embankment is up to grade.

### **2300 - 4 MEASUREMENT**

- 4.01 The volume of embankment will be measured in cubic metres in the final position. The volume will be determined from the cross-section method, except that volumes of ditch blocks and approaches may be determined from the average length, width, and depth. Measurement of the volume is for the purpose of computing haul.

## **2300 - 5 PAYMENT**

- 5.01 Construction of an embankment in accordance with this specification will not be paid for directly but will be considered as a subsidiary obligation of the Contractor under the contract unit price for Earth Excavation (Specification 2200) and/or Rock Excavation (Specification 2250) and/or Disposal of Surplus Rock (Specification 2320).
- 5.02 Payment for watering on the road will be in accordance with the requirements for Watering (Specification 2500).