

## **SPECIFICATION SECTION 03100 - COMMON SOIL EXCAVATION**

### **TABLE OF CONTENTS**

1. DESCRIPTION.....	3
2. CONSTRUCTION REQUIREMENTS .....	4
2.1 Common Soil Excavation .....	4
2.2 Reuse of Suitable Material .....	6
2.3 Disposal of Unsuitable or Surplus Common Soil Excavation Material .....	6
2.4 Work in Canals and Waterways.....	7
2.5 Dimensional Tolerances .....	7
3. MEASUREMENT AND PAYMENT .....	8
3.1 Method of Measurement .....	8
3.2 Basis of Payment .....	9



## **SPECIFICATION SECTION 03100 - COMMON SOIL EXCAVATION**

### **1. DESCRIPTION**

This Specification Section prescribes Common Soil Excavation to all required areas of Site.

Common soil excavation covers excavating in all types of materials except rock as defined in subsection 2.1 s) of this Specification Section.

Common Soil Excavation shall include supports to the sides or additional excavation to form sloped sides, working space, keeping the excavations free of all water (including surface water and ground water), segregation of material suitable for backfilling or embankments, all necessary handling, stockpiling, disposal, shaping and trimming completed excavations in accordance with the locations, lines, levels, grades and dimensions shown on the Drawings and as specified herein.

Common Soil Excavation includes general over site excavation to reduce levels.

Common Soil Excavation shall also include excavation in and the necessary diversion of or containment of canals and water courses; including all necessary pumping, draining, sheeting, bracing and the construction, maintenance and subsequent removal of cribs and cofferdams. Prior to commencement of Common Soil Excavation the Contractor shall obtain the Engineer's written instructions regarding work area and depth limits and approval of the equipment and materials to be used and the method of work execution.

The Contractor shall produce and obtain the Engineer's approval of the method statement for the earthworks which shall include an earthworks balance schedule or plan. The earthworks balance schedule or plan shall include details of the use of suitable material, in particular the locations and volumes, for excavation and placing of materials. The plan shall be updated on a weekly basis, in accordance with the progress of the Works and submitted with the Contractor's weekly work schedule until the completion of the roadway excavation. Where appropriate the Contractor shall use comparatively better materials in the upper levels of embankment construction.

All materials arising from Common Soil Excavation shall remain the property of the Employer. The Engineer will direct the Contractor where the excavated material, which is not required by the Employer, is to be deposited on Site. Materials generally shall be set aside for reuse or transported and deposited by

the Contractor at locations on the Site or off the Site.

In the event that materials from the Common Soil Excavation are not required by the Employer the materials shall be removed by the Contractor from the Site to a disposal area(s) selected by the Contractor.

## **2. CONSTRUCTION REQUIREMENTS**

### **2.1 Common Soil Excavation**

- a) Common Soil Excavation shall not start until topsoil has been removed from the work area in accordance with Specification Section 03050 Removal of Topsoil.
- b) Prior to the start of any excavation the Contractor shall carry out a topographical survey of the area and prepare and submit the cross section and profile drawings to the Engineer for his approval. These drawings shall be used as a basis for the computation of the actual volume of excavated materials.
- c) The working methods and equipment used for Common Soil Excavation shall take into account the nature of soils encountered and the ground water table level.
- d) The Contractor is to provide all necessary means for dewatering excavations and maintaining them free of all water, including ground water and storm water.
- e) Excavation shall be performed carefully to avoid overbreak or unnecessary disturbance of adjacent surfaces. Any overbreak or disturbance caused by excavation operations shall be backfilled, compacted and restored by the Contractor and as directed by the Engineer.
- f) When unsuitable material is excavated below embankments or below normal subgrade level the void so formed shall be backfilled with suitable material, compacted in 20cm layers to 95 % of its maximum dry density, to the approval of the Engineer.
- g) Slopes in excavations shall be formed and maintained to prevent the formation of standing water. All excavations shall be finished to reasonably smooth and uniform surfaces.
- h) Water from excavations shall not be permitted to flow directly into the new drains or other construction work.

- i) Where pumping is necessary, the material in and around the excavations shall not be disturbed by pumping and all slumps shall be formed clear of excavations for the Permanent Works.
- j) Water pumping at all low points shall be provided continuously until the permanent drainage systems are finished and connected to the existing drainage network.
- k) Temporary drains shall be built as excavation progresses.
- l) Effective temporary decantation basins shall be installed before the water is drained into recently completed or existing drainage systems.
- m) The drainage network for the water coming from the work area, whether on or outside the Site, shall be permanently protected against pollution, maintained and kept clean until the end of work.
- n) The Contractor shall divert, as required, all ditches, field drains, foul drains, sewer, water and electrical mains, ducts, etc. wherever encountered during the progress of the work. Where such diversions are temporary the Contractor shall subsequently reinstate them to the Engineer's approval.
- o) Existing ditches shall not be filled until diversion ditches have been excavated or without the Engineer's permission.
- p) The Contractor shall organize each section of the earthworks rationally so as to eliminate prolonged exposure of subgrade and bottom of excavations during wet weather.
- q) All excavated grades shall be kept well drained at all times with no storm water standing on the surface and protected as necessary to avoid deterioration.
- r) Any cave in caused by slides or other forces shall be restored by the Contractor at his own expense.
- s) The classification of excavated material into soil or rock shall be made according to the following test using a bulldozer with a hydraulic ripper. The test shall be performed by the Contractor under the direction of the Engineer.

Table 1: Standard Test Method for Classification of Soil and Rock

Test Items	Requirements
Standard Specification of Test	Bulldozer (110CV) with one tyne hydraulic

Test Items	Requirements
Machine	ripper
Test Frequency	At least one test at a mountain/location on the construction site
Test Area	Area: 15m×30m Hauling distance: 20 - 30m Slope of test area : 0 – 5 %
Test Method	Crushing by ripper and hauling by blade of the bulldozer $Q_R = \text{Net excavation volume (m}^3\text{)} / \text{Time (hr)}$
Criteria for judge of the classification	Rock : $Q_R / Q < 0.4$ $Q = \text{Standard excavation capacity (21 m}^3\text{/hr)}$

## 2.2 Reuse of Suitable Material

- a) Suitable material arising from the Common Soil Excavation shall be used as backfill to structures or in the embankment works.
- b) Suitable material is defined as Common Excavation material that complies with the Specification Section 03400.
- c) Where the excavation reveals a combination of suitable and unsuitable materials the Contractor, unless otherwise instructed by the Engineer, shall carry out the excavation in such a manner that the suitable material is excavated separately for use in the Works without being contaminated by the unsuitable material.
- d) Material that becomes unsuitable as the result of incorrect handling or construction methods or contamination by the Contractor shall be disposed of and replaced at the expense of the Contractor.
- e) All excavations shall be finished to reasonably smooth and uniform surfaces. Excavation operations shall be conducted so that material outside the limits of slopes is not be disturbed.

## 2.3 Disposal of Unsuitable or Surplus Common Soil Excavation Material

- a) All other excavated materials, either within or beneath the design excavation limits, that do not meet the specification for embankment material or are liable, in the opinion of the Engineer, to be detrimental to the Permanent Works shall be designated “unsuitable material”.
- b) Unsuitable materials shall also include soils which:
  - i) Contain unacceptable quantities of peat, roots or organic matter or

- ii) Have a low natural density less than 800kg/m<sup>3</sup> or
  - iii) Are highly expansive or
  - iv) Have hazardous chemical or physical properties.
- c) All disposal sites provided and used by the Contractor shall comply with the relevant Vietnamese Laws and regulations concerning the protection of the environment.
- d) Unsuitable or surplus material shall only be removed from the Site to the disposal sites following the written confirmation of the Engineer.
- e) The Contractor shall comply with all local environmental regulations when disposing of unsuitable material and shall include in his environmental management plan all relevant details for the hauling and disposal of unsuitable materials.

## **2.4 Work in Canals and Waterways**

- a) The Contractor shall ensure that all temporary restrictions or diversions of canals or watercourses are; safe, cause no interference to water flows and comply with the regulations of relevant Authorities.
- b) Suitable cofferdams shall be used. The Contractor shall submit calculations and drawings for these Temporary Works to the Engineer.
- c) Sheet piles used in the construction of cofferdams shall be; founded well below the bottom of permanent foundations, be adequately braced and as watertight as practicable.
- d) The internal dimensions shall be such as to allow sufficient clearance for excavation operations and the construction of Temporary and Permanent Works within.

## **2.5 Dimensional Tolerances**

- a) After excavation the dimensional tolerance for; finished lines, grades and formations of designated areas instructed by the Engineer shall be  $\pm 2\text{cm}$  of dimensions shown on the Drawings.
- b) All exposed finished excavated surfaces shall be; properly graded, uniform and shall have sufficient slope to ensure that they are free draining and free from ponding during rainfall.

### **3. MEASUREMENT AND PAYMENT**

#### **3.1 Method of Measurement**

- a) Excavation in all soil materials except rock:
  - i) Work under this Specification Section shall be measured according to the item classifications and units contained in the Bill of Quantities. Common Soil Excavation shall be measured in cubic meters (m<sup>3</sup>).
  - ii) The volume of Common Soil Excavation shall be computed from the direct plan area necessary to accommodate the Permanent Works, multiplied by the average depth from the designated ground surface level after topsoil removal to the designated subgrade level indicated on the Drawings or as instructed by the Engineer.
  - iii) The volume of any unsuitable material instructed by the Engineer to be excavated beyond the limits defined above shall be calculated by site measurement or survey at these locations and included in the total volume and paid for as Common Soil Excavation.
  - iv) Any additional fill material required to backfill the additional excavation from (iii) above shall be included in the total volume of and paid for as Embankment under Specification Section 03400.
  - v) The quantities of excavated material measured in this section shall not be adjusted for any design changes made by the Contractor without the approval of the Engineer or for any material classified as “unsuitable” without the approval of the Engineer.
  - vi) The Contractor is required to take due care of the Works and no measurement shall be made for over break or excavation outside the lines, grades and levels in the Drawings or subsequently approved by the Engineer.
  - vii) The quantities of excavated material measured in this section shall not be adjusted for any material used by the Contractor in his own Temporary Works.
- b) Disposal of Excavated Material
  - i) The unit rates of the pay items for common soil excavation shall include the costs of disposing surplus or unsuitable common excavation on or off Site, in accordance with the Engineer’s instruction. No separate pay item will be measured or paid for this work.

- ii) No allowance will be made in the quantities of retained material or disposal for bulking or shrinkage.
- d) The Common Soil Excavation provisions and construction requirements identified in this Specification Section shall be measured for payment in pay item 03100-01.
- e) Any Common Soil Excavation Works not specifically identified in this Specification Section but which are necessary for the performance of the Works shall be deemed to be included in pay item 03100-01.
- f) The unit rates shall not be adjusted to take cognizance of different haul distances, whether within the Site or off the Site.
- g) The volume of common soil excavation, suitable for reuse in the embankment or other parts of the Works, will be instructed by the Engineer on Site, according to the actual ground conditions encountered.

### **3.2 Basis of Payment**

The work under this Specification Section shall be paid for in accordance with the applicable unit prices as indicated in the Bill of Quantities and given below. Payment shall constitute full compensation for performing the requirements of the Contract for the item of work as specified including furnishing all necessary labor, materials, tools, equipment, incidentals and tests subject to the following.

- a) Unit prices for Common Soil Excavation shall include for:
  - i) Reinstating any existing adjacent surface paving or sodding disturbed by the Common Soil Excavation.
  - ii) Removal of all water including surface and ground water by whatever means necessary.
  - iii) Forming any trial holes to locate existing pipes or cables
  - iv) Excavating by hand, machine or explosives
  - v) Excavating in any material likely to be encountered including all clays, sands, silts, rock, boulders, paved areas, old foundations.
  - vi) All necessary earthwork supports (timber planking and strutting, unbraced or braced, steel sheet piles) and protection to uphold and maintain sides of excavation adjacent paving or other structures.
  - vii) Additional excavation to form sloping sides to excavations at option of Contractor and additional costs of backfilling, disposal, etc.

associated therewith.

- viii) All required excavation for working space including additional backfilling, disposal, earthwork supports and all other additional costs associated therewith.
- ix) Leveling, grading, trimming, compacting and protecting excavated surfaces.
- xi) Setting aside soil and rock material for reuse on Site.
- xii) Disposal of unsuitable material off Site.
- xiii) Disposal of surplus material off Site.

<b><u>Pay Item</u></b>	<b><u>Description</u></b>	<b><u>Unit</u></b>
<b>03100</b>	<b>Common Soil Excavation</b>	
03100-01	Soil Excavation	m <sup>3</sup>