



Uhde India Limited

**PART II  
TECHNICAL SPECIFICATIONS  
SECTION-1  
EARTHWORK**

DOC NO.:  
CI-UCH-016-01

Rev. :R0  
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**Applicable Revision:**

**Prepared:**

**Checked:**

**Approved:**

**Date:**

**Date:**

**Date:**

**First Edition: R0**

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**SD/-**

**SD/-**

**SD/-**

**Date: 07.08.03**

**Date: 07.08.03**

**Date: 07.08.03**

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File Name : TSP1.DOC

**EARTH WORK: EXCAVATION, BACKFILLING & DISPOSAL****1.1 Scope**

The specification covers the general requirements of earthwork in excavation in different materials, filling in areas as shown in drawing, filling back around foundations and in plinths, transportation and / or disposal of surplus spoils or stacking them properly as shown on the drawings and as directed by engineer and all other operations covered within the intent and purpose of this specification.

**1.2 General**

1.2.1 Contractor shall furnish all tools, plants, instruments, materials and all consumables and every thing necessary, whether or not such items are specifically stated herein including temporary facilities like platform, walkways, etc. also including skilled/unskilled manpower along with supervisory personnel for completion of the job in accordance with requirements of specifications & standard practice.

1.2.2 The excavation shall be done to correct lines and levels. This shall also include where required, proper shoring to maintain sides of excavations, and strutting along with furnishing, erecting and maintaining of necessary barricades around excavated areas and warning lamps at night for ensuring safety.

1.2.3 The rates quoted shall also include for dumping of excavated materials in regular heaps, bunds, riprap with regular slopes as directed by Engineer, within the lead specified and levelling the same so as to provide natural drainage. Rock/soil excavated shall be stacked properly as directed by Engineer. As a rule all softer material shall be laid along the centre of heaps, the harder and more weather-resisting materials forming the casing on the sides and the top. Soft and hard rocks shall be stacked separately.

1.2.4 Any finds of archaeological interest such as relics of antiquity, coins, fossils or other articles of value shall be delivered to the Engineer. Any material obtained from the excavation, which in the opinion of the Engineer is useful, shall be stacked separately in regular stacks as directed by the Engineer.

**1.3 Applicable Codes**

The following Indian Standard codes, unless otherwise specified herein, shall be applicable. In all cases, the latest revision of the codes shall be referred to.

- a. IS:783 - Code of Practice for laying of concrete pipe.
- b. IS:1200 - Method of Measurement of Building work.
- c. IS:3764 - Safety code for excavation work.
- d. IS:4082 - Recommendation for stacking and storage of construction materials at sites.
- e. IS:3385 - Code of practice for measurement of civil Engineering Works.
- f. IS:2720  
Part-II - Determination of Moisture Content.  
Part-VII - Determination of Moisture Content Dry Density Relation Using Light Compaction.  
Part-XXVIII - Determination of Dry Density of Soils, in place, by the Sand Replacement Method.  
Part-XXIX - Determination of Dry Density of Soils, in place, by the Core Cutter Method.

**1.4 Materials For Back-Filling & Soling**

The materials and workmanship shall conform to provisions of the following codes and standard specifications :

- IS:1200 - Method of measurement for building work.
- IS:3764 - Safety code for excavation work.

Murrum - Murrum for backfilling shall be freshly excavated free from vegetation, boulders, silt and clay and as approved by the Engineer.

Sand - Sand for backfilling shall be medium, hard, free from organic and other deleterious materials, silt and clay and as approved by the Engineer. It should be suitable for attaining compaction of 90% of laboratory maximum dry density.

Rubble - Rubble for soling shall be hard, tough, durable and of approved quality. It shall be regular in shape and size of about 200 to 230 mm or as specified in the drawing.

All materials shall be obtained from sources approved by Engineer and shall conform strictly to samples initially approved by Engineer prior to start of supply at site. Change in source of materials shall be avoided. If unavoidable, the new sample and the source shall be again approved by Engineer before actual commencement of supply of materials at site from fresh sources.

1.5

**Excavation**

Excavation shall be carried out in any type of soil met at the site for items and to the lines, levels and contours as directed by the Engineer

Excavated materials shall not be deposited within 1.5M from edge of the excavation.

Suitable type of shoring and strutting, wherever necessary, shall be provided to avoid any collapse of earth or cutting in slope as per site requirement and as directed by the Engineer.

Pits shall not be excavated to final founding level unless concreting work is imminent. Last 15 cms. shall be excavated prior to providing, blinding layer with lean concrete (M5, unless otherwise specified in drawing). The contractor shall not undertake any concreting in foundation until the excavated pit is approved by the Engineer.

If any bottom of excavation is left exposed and has become deleteriously affected by atmosphere or water, it shall be dewatered and excavated to sound base, and shall be filled up to the required level with lean concrete of grade M-15 at the cost of Contractor. Similarly excess excavation than the required level also to be filled up with lean concrete at the cost of Contractor.



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Any obstacle, encountered during excavation shall be reported to the Engineer and shall be dealt as directed. Removal of buried piping or cables shall not be done without prior permission of Engineer and contractor shall provide all measures to protect such lines. Cost of such protective measures are deemed to have been included in the unit rates for excavation.

The contractor shall take adequate protective measures to ensure that the excavation operations do not damage the adjoining structures or dislocate underground services.

Excavated material shall be deposited within radius of 50M or as specified in the item of work. Selected excavated material, on approval by Engineer shall be back-filled in layers of maximum 15 cms. Watering, compacting shall be done as specified in method of backfilling.

The Contractor shall arrange to cut or transplant any trees coming in the alignment of the excavation or other work after obtaining prior approval and complying with all requirements of the concerned authority and remove the same wherever required. Unless otherwise stated no separate payment shall be made for the same.

The Contractor shall provide suitable drainage arrangements to prevent surface water entering foundation pits. The contractor shall engage pumps or other approved means to keep excavation free of water.

In cases, where during excavation, side slips occur, for reasons not attributable to the Contractor or in cases of pumping out water accumulated due to unforeseen reasons like watermains / drains broken accidentally by other agencies, springs etc., suitable payment shall be made separately at the rates mutually agreed.

Lowering of water table by well point system or other such special measures shall be paid separately against relevant item in the B.O.Q. or by mutual agreement.

1.6

**Excavation In Rock:**

By Blasting : Blasting shall be done by the licensed blaster approved by the Engineer. The contractor shall obtain licence from statutory bodies for undertaking blasting work as well as for obtaining and storing the explosive as per prevalent rules.

Blasting shall be done by using approved blasting powder or gelatine brought from licensed supplier.

Blasting shall be controlled blasting. Controlling shall be done by covering portion to be blasted with steel plates or woven mesh of wire ropes, meshed at 200 x 200 mm spacing and loaded with sand bags.

Blasting shall be done with ample precaution, normally during lunch time by :

- i. Evacuating the area within minimum distance of 100M from the region to be blasted. Guarding the boundaries of the excavated area by keeping persons, minimum four, with Red flags on the boundary to prevent entry of personnel during blasting operation.
- ii. It is preferred, if signaling system is provided to give signals before and after blasting.

Blasting shall conform to IS:4081, IS:10081.

Chiselling as required shall be carried out to obtain correct slopes, shape and pattern of excavation as per drawings. No extra payment will be made for chiselling.

The other specifications for earthwork shall also apply to excavation in rock in general.

**1.7 Soil classification for purpose of measurement and payment**

All materials to be excavated shall be classified by Engineer, into one of the following classes and shall be paid for at the rate approved for that particular class of material. No distinction shall be made whether the material is dry, moist or wet. The decision of Engineer regarding the classification of the material shall be final and binding on Contractor and not be a subject matter of any appeal or arbitration.

Any earth work shall be classified under any of the following categories; in accordance with IS-1200 part I.

**a. Ordinary soils**

These shall include all kinds of soils containing kankar, sand, silt, hard and soft murrum and/or shingle, gravel, clay, loam, peat, ash, shale, etc.. which can generally be excavated by spade, pick axes and shovel, and which is not classified under "soft and decomposed" and "hard rock" defined below.

This shall also include embedded rock, rubble not longer than 500 mm in one direction and not more than 300 mm in the other two directions. Removal of such ordinary soils by mechanical excavators, shovels, draglines etc. shall be payable at the rate for 'Ordinary soils'.

**b. Soft and Decomposed Rock**

This shall include rock, boulders, slag, chalk, slate, hard micaceous, laterite and all other materials which in the opinion of Engineer is rock, but does not need blasting and could be removed with picks, hammer, crow bars, wedges and pneumatic breaking equipment. The mere fact that Contractor resorts to blasting for reasons of his own, shall not qualify for classification under 'hard rock'. This shall also include excavation in macadam and tarred roads and pavements. This shall also include rock boulders longer than 500 mm in one direction and not more than 500 mm in any one of the other two directions.

c. Hard Rock

This shall include all rock occurring in large continuous masses, which cannot be removed except by blasting for loosening it. Hardened varieties of rock with or without veins and secondary minerals, which, in the opinion of engineer require blasting shall be considered as hard rock. Boulders of rock occurring in such sizes and not classified under (a) and (b) above shall also be classified as hard rock. This will also include reinforced cement concrete (reinforcement to be cut through, but not separated from concrete).

1.8 Backfilling

Backfill material shall be either that part of excavated material, which is specially approved by Engineer as suitable for backfill and stacked separately for this purpose or material brought from outside sources as approved by Engineer.

The contractor shall not fill in and around any work, until it has been approved by the Engineer. Backfilling around liquid retaining structures shall be done only after testing of structures against leakage is done and approval from Engineer is taken.

Back filling shall be done in layers of thickness not exceeding 15 cms. Optimum watering shall be done to obtain maximum compaction and density free from pockets. Compaction shall be done with mechanical equipment such as plate vibrators, rollers. In exceptional cases hand compaction may be resorted to as directed by the Engineer.

The Engineer reserves the right to order compaction test in initial stages and whenever required during the progress of the work, to satisfy degree of compaction upto 90% of laboratory dry density (proctor) in the case of soils other than sand and 85% of relative density in the case of sand.



**1.9 Rubble Soling**

Rubble laying shall commence on required level in proper grade and on properly cambered sub-base. Stones shall be hand packed as close as possible and bedded firmly on broadest base. Voids shall be filled with chips and small stones. The interstices shall be filled up with selected (approved) earth/murram. If possible, this base shall be rolled with 8/10 T roller, with appropriate watering and refilling voids with consent of the Engineer. Further activities such as laying plain concrete will be carried out after the approval of the Engineer.

**1.10 Mode of Measurement : 1200****1.10.1 Excavation Items**

The payment shall be made on cubic metre basis, on the measurement of column of pit size worked exactly as per dimensions of RCC/PCC given in drawing, (no allowance for excess excavation). The unit rate includes setting out and line out work, shoring / strutting, dewatering, backfilling, removal and disposal of surplus earth within lead of 50 M radius or as specified in the item of work, after backfilling with selected earth as specified. Any extra excavation for slopes, working space, collapses and additional working space required for painting the sub structures shall not be measurable / payable. The contractor may make such allowances in his rates to provide for excavation in side slopes keeping in mind the nature of the soil and safety of excavation.

**1.10.2 Filling in plinth with material brought from outside**

The payment shall be made on Cu.m. basis of the finished compacted volume. Rate shall include cost of material, handling, transport for all leads, watering, compaction, labour and testing etc. complete.

**1.10.3 Disposal of surplus earth**

The payment shall be made on Cu.m. basis on the difference of measurements of the volumes of excavated material and the backfill. The rates shall include loading, transporting, dumping, levelling in the area demarcated by the Engineer.



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**1.10.4 Rubble Soling**

The payment shall be on Sq.m. basis. The rate shall include supply of rubble, stone chips, murrum, quarry spoil, handling, labour, watering, rolling, compaction etc. complete.

1.10.5 Measurement of Rock Excavation - will be made by final levels and payment shall be made on Cu.m. basis, exactly as per levels and dimensions of RCC/PCC given in drawing. No allowance shall be added for excess excavation and the same shall be assumed to be covered in quoted rates.

**END**