2100

Open Foundations

2101. DESCRIPTION

The work shall cover furnishing and providing plain or reinforced concrete foundation placed in open excavation, in accordance with the drawings and these specifications or as directed by the Engineer.

2102. MATERIALS

Materials shall conform to Section 1000 of these Specifications.

2103. GENERAL

A method statement for construction indicating the following shall be submitted by the Contractor for approval of the Engineer, well in advance of the commencement of open foundation :

i) Sources of Materials

ii) Design, erection and removal of formwork

iii) Production, transportation, laying and curing of concrete

iv) Personnel employed for execution and supervision

v) Tests and sampling procedures

vi) Equipment details

vii) Any other point

Necessary arrangements for execution under water wherever necessary, shall be included in method statement.

Dimensions, lines and levels shall be set out and checked with respect to permanent reference lines and permanent bench mark.

2104. WORKMANSHIP

2104.1. Preparation of Foundations

Excavation for laying the foundation shall be carried out in accordance with Section 300 of these specifications. The last 300 mm of excavation shall be done just before laying of lean concrete below foundation.

In the event of excavation having been made deeper than that shown on the drawing or as ordered by the Engineer, the extra depth shall be made up with M15 concrete in case of foundation resting on soil and foundation grade concrete for foundations in rock, at the cost of the Contractor and shall be considered as incidental work. Special care shall be taken not to disturb the bearing surface. Open foundations shall be constructed in dry conditions and the Contractor

shall provide for adequate dewatering arrangements to the satisfaction of the Engineer.

2104.2. Setting Out

The plan dimensions of the foundation shall be set out at the bottom of foundation trench and checked with respect to original reference line and axis. It shall be ensured that at no point the bearing surface is higher than the founding level shown on the drawing or as directed by the Engineer.

2104.3. Construction

Where the bearing surface is earth, a layer of M15 concrete shall be provided below foundation concrete. The thickness of lean concrete layer shall be 100 mm minimum unless otherwise specified.

No formwork is necessary for the lean concrete layer. For foundation concrete work, side formwork shall be used. Formwork for top of the foundation concrete shall also be provided, if its top has slopes steeper than 1(vertical) to 3 (horizontal). When concrete is laid in slope without top formwork, the slump of the concrete shall be carefully maintained to ensure that compaction is possible without slippage down the slope of freshly placed concrete. In certain cases it may be necessary to build the top formwork progressively as the concreting proceeds up the slope. Reinforcement shall be laid as shown on the drawing.

Before laying of lean concrete layer, the earth surface shall be cleaned of all loose material and wetted. Care shall be taken to avoid muddy surface. If any portion of the surface has been spoiled by over-wetting, the same shall be removed. Concrete M15 shall be laid to the thickness as required. No construction joint shall be provided in the lean concrete.

Before laying foundation concrete, the lean concrete or hard rock surface shall be cleaned of all loose material and lightly moistened. Foundation concrete of required dimensions and shape shall be laid continuously upto the location of construction joint shown on the drawing or as directed by the Engineer.

Formwork and concrete shall conform to Sections 1500 and 1700 respectively of these specifications. Furnishing and providing steel reinforcement shall conform to Section 1600.

The concrete surface shall be finished smooth with a trowel. The location of construction joint and its treatment shall be done as per

requirements of Section 1700. Formwork shall be removed not earlier than 24 hours after placing of concrete. Where formwork has been provided for top surface, the same shall be removed as soon as concrete has hardened. Curing of concrete shall be carried out by wetting of formwork before removal. After its removal, curing shall be done by laying not less than 10 cm of loose moistened sand, free from clod or gravel and shall be kept continuously moist for a period of 7 days.

Dewatering, where necessary for laying of concrete, shall be carried out adopting any one of the following procedures or any other method approved by the Engineer:

i) A pit or trench deeper than the foundation level as necessary may be dug beyond the foundation pit during construction so that the water level is kept below the foundation level.

ii) Water table is depressed by well point system or other methods.

iii) Use of steel/concrete caissons or sheet piling for creating an enclosure for the foundations, which can subsequently be dewatered.

Before backfilling is commenced, loose sand laid on foundation shall be removed and dispersed as directed by the Engineer.

All spaces excavated and not occupied by the foundation or other permanent works shall be refilled with earth upto surface of surrounding ground in accordance with Section 300. In case of excavation in rock, the annular space around foundation shall be filled with M15 concrete upto the top of rock.

The protective works, where provided shall be completed before the floods so that the foundation does not get undermined.

2105. TESTS AND STANDARDS OF ACCEPTANCE

The materials shall be tested in accordance with these Specifications and shall meet the prescribed criteria.

The work shall conform to these Specifications and shall meet the prescribed standards of acceptance.

No point of the surface of the lean concrete in the case of foundation on soil or the surface of hard rock in the case of foundation of hard rock, shall be higher than the founding level shown on the drawing or as ordered by the Engineer. Levels of the surface shall be taken at intervals of not more than 3 metres centre to centre, subject to a minimum of nine levels on the surface.

2106. TOLERANCES

a)	Variation in dimensions	:	+50 mm - 10 mm
b)	Misplacement from specified position in plan	:	15 mm
c)	Surface irregularities measured with 3 m straight edge	:	5 mm
d)	Variation of levels at the top	:	±25 mm

2107. MEASUREMENT FOR PAYMENT

Excavation in foundation shall be measured in accordance with Section 300 based on the quantity ordered or as shown on the drawing.

Lean concrete shall be measured in cubic metres in accordance with Section 1700, based on the quantity ordered or as shown on the drawing.

Concrete in foundation shall be measured in cubic metres in accordance with Section 1700, based on the quantity ordered or as shown on the drawing.

Reinforcement steel shall be measured in tonnes in accordance with Section 1600, based on the quantity ordered or as shown on the drawing.

2108. RATE

The contract unit rates for excavation in foundation, lean concrete and concrete in foundation and reinforcement steel shall include all works as given in respective sections of these specifications and cover all incidental items for furnishing and providing open foundation as mentioned in this Section.