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- 2.1 These specifications shall be read in conjunction with the CPWD specifications 2019 / latest specifications with up-to-date correction slips, and other relevant specifications described in the S.01 of Section-VII-F of these specifications.
- 2.2 Results of the sub-surface investigations conducted at the project site are enclosed with the tender document. This information about the soil and sub-soil water conditions is being made available to the Contractor in good faith and the Contractor is advised to obtain details independently as may be considered necessary by him before quoting rates in the tender. No claim whatsoever on account of any discrepancy between the sub-surface conditions that may be actually encountered at the time of execution of the work and those given in these Tender Documents shall be admissible to the Contractor under any circumstances whatsoever.
- 2.3 Excavation of rock may be carried out by chiselling, jack hammers, crow bars, wedging and using cutting machine or by any other method approved by the Engineer, use of non-explosive demolition compounds shall also be permitted.

Open blasting is not permitted under scope of this contract but at discretion of the Engineer, controlled blasting may be permitted only in very special cases where all alternative methods have failed to achieve the satisfactory results. The Blasting, if permitted, shall be carried out within the pre-defined fixed period to be decided in consultation with and due permission of local authorities and approved by Engineer. Contractor shall take all necessary precautions to prevent flying of blasted stones outside the excavation pit and damage to adjacent structure etc. by controlling spacing and quantity of explosive charge and covering the sufficient area of blasting by steel plates loaded with adequate amount of sandbags. All operations of controlled blasting shall be carried out under the supervision of a responsible authorised blasting agent. Contractor shall be responsible for any damage arising out of blasting operation to workmen, public or any property. Contractor shall obtain all necessary permission from Traffic Police and other concerned authorities for blasting as required. Non-granting of permission for blasting by concerned authorities will not be considered as reason for delay or any claim thereof.

- 2.4 Excavation for all works and of materials required for filling shall be to the exact width length and depth shown on the drawings or as directed by the Engineer. Where the nature of soil or the depth of the trench and season of the year, do not permit vertical sides, the contractor at his own expense shall put up the necessary shoring, strutting and planking with due regard to the safety of personnel and works and to the satisfaction of the Engineer. The construction barricading will have a width of 9.0m (outside to outside of barricading). This can be increased at specific locations with approval of Engineer. The Contractor shall submit method statements for approval of Engineer demonstrating how this will be achieved at site. If required, driving of rolled section / sheet pile of suitable size shall be done into the soil to retain earth as directed by Engineer. Measurement of plan area for excavation for payment in case of foundation works shall be deemed inclusive in the quoted cost of foundation works in BOQ.

If excavation is carried out to greater depth than required beyond the level specified, for any reason whatsoever, such volume shall be made good by filling with PCC M10 having coarse aggregates 40 mm and downgraded and brought to level to receive the levelling course below foundations. If excavation is carried out to greater width and length, such extra width and length shall be filled in by sand. No extra payment will be made on this account.

Propping shall be undertaken when any foundation or stressed zone from an adjoining structure is within a line of 1 vertical to 2 horizontal from the bottom of the excavation.

All excavations shall be carried out in conformity with the directions laid hereunder and in a manner approved by Engineer. The work shall be so done that the suitable materials available from excavation are satisfactorily utilized as decided upon beforehand.

- 2.5 The last 200mm depth of excavation shall be done not earlier than 36 hours before laying the levelling course below foundations.

- 2.6 The Contractor shall make provision for all shoring, dewatering, dredging, bailing out or draining water whether subsoil or rain or other water and the excavation shall be kept free of water while the masonry work or concrete work is in progress and until the Engineer considers the work well set (Refer IS: 3764 Safety Code for Excavation Work). The sides of trenches shall be kept vertical and the bottom horizontal and shall be run level throughout or properly stepped as directed by the Engineer. No extra payment shall be made on this account.

Dewatering shall be carried out by suitable means with adequate stand-by arrangements as may be approved by the Engineer. The level of ground water shall be maintained at least 300mm below the lowest level of excavation during the laying of foundations. The Contractor shall be deemed to have satisfied himself with regard to feasibility of all aspects of dewatering including site constraints due to existing structures. Though the method of dewatering is left to the contractor, he shall be required to submit method statement of dewatering scheme including requisite justifications to the Engineer and seek his prior written approval.

Approval of the Engineer, however shall not relieve the contractor of the responsibility of adequacy and appropriateness of dewatering and protection arrangements for the quality and safety of the work. The contractor shall satisfy the Engineer as to the capacity of the drains or disposal site to take the required quantity and flow of water to be pumped out at various stages of excavation. The Contractor shall obtain necessary approvals of local bodies for discharging the pumped out water. All the dewatering pumps shall therefore also have dedicated D.G. Power supply which shall come on automatically in case of failure of electrical supply from the mains. The cost of dewatering provisions shall be deemed inclusive in the quoted cost of the work for foundation works and embankment works in BOQ.

- 2.7 The Contractor shall erect and maintain during progress of works temporary fences with all safety measures around dangerous excavations at contractor's cost.

Near habitations and traffic prone areas, trenches and foundation pits or any other excavation work shall be fenced, provided with proper caution signs and marked with red lights, reflectors at night to avoid accidents. The contractor shall take all adequate protective measures to see that excavation operations do not affect or damage adjoining structures.

- 2.8 Excavation material required for filling shall be stacked or dumped where indicated by the Engineer. Excavated material not required for filling and any surplus material shall be removed or spread on the site as directed by the Engineer or carted away from the site as directed by the Engineer. Dumping of this surplus material shall be in an orderly environmental in friendly manner using tarpaulin cover, dumper, placer etc. and according to the levels/grades as indicated by the Engineer. The cost of such removal and spreading shall be borne by the Contractor and deemed to be included in the Contract Rates. Necessary approval from the local authorities for carting and dumping surplus material is to be obtained by the contractor.
- 2.9 The Contractor shall notify to the Engineer when the excavation is completed and no base or Concrete or Masonry shall be laid until the Engineer has inspected and approved of the soil conditions obtained for each individual footing or the full raft area.
- 2.10 The Contractor shall ensure the stability of the excavation so that the surrounding ground and all adjoining structures and plants will be safe against settlement, subsidence and damage and that there is no risk of injury to personnel.
- 2.11 In case of any underground structures that need to be protected (like underground sewer lines etc.) are encountered, the Contractor shall bring the same to the notice of the Engineer immediately and shall take all such steps as the Engineer may instruct for protection of such structures. Such protective measures shall be done at the Contractor's cost. If any damage occurs to such items which were required to be protected during execution, the same shall be made good by contractor at his own cost otherwise employer will arrange to make it good at the risk and cost of contractor.
- 2.12 The Contractor may dispose of the surplus earth from the project site to a place/ places as may be permitted by the Engineer. The transportation of the surplus earth shall be done by mechanical means only. The Contractor shall at his own cost obtain necessary clearances/ permissions statutory or otherwise needed for the purpose. Dumpers may be used for transporting slushy material excavated from pile boring / well boring / pile cap / Open Foundation with precautions for non-spillage of muck.
- 2.13 In the foundation the backfilling shall be done in layers not more than 200 mm thick and shall be thoroughly watered and consolidated by approved method.
- 2.14 In case sand is used for backfilling in foundation and plinth, it shall be approved by the Engineer. In the foundation, the backfilling shall be done in layers not more than 200 mm thick and shall be thoroughly watered and consolidated by approved method. The rate for backfilling using sand in foundation is deemed to have been included in the contract price.
- 2.15 For open foundation resting on rock, if the sound rock is located at very shallow depth, the contractor is required to cut the rock (of all type or strength) to a depth so that open foundation with a minimum earth cushion of 500mm can be accommodated.
- 2.16 **Measurement and Payment**  
Payment for excavations in soil and/or rock, including providing and installing shoring / strutting, dewatering, pumping and bailing out water shall be made as per the quoted rate of the respective items of excavation as specified in BOQ. However, unless stated otherwise, the quoted rates for concrete in foundation (upto ground level) shall be deemed to include the cost of shoring, strutting, dewatering and backfilling using earth or sand wherever required with compaction of the same.

