**ANNEX- I**

**Name of Work: Marine Geotechnical Investigations at Inshore Channel, Container Terminal & MCB including Access Channel near Tuna - Tekra at Deendayal Port Authority.**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Sr. No.** | **Description of Items** | **Quantity** | **Rate** | | | | | **Units** | **Amounts** |
| **In Fig.** | | | | **In Words** | **In Fig.** |
| 1 | Drilling of 90 mm diameter bore holes NX drill at required locations to a depth in range of approximately as per sub soil strata on using bentonite slurry below existing ground level through sand’ silt and clay including rock, pebble gravel or boulders for proposed soil investigation including all labour, consumable materials, providing and operating boring machineries, insurance & incidental expenditure, taking all necessary field samples, analyzing them in field / laboratory, submission of test result and completion of report along with relevant bore log and graph sheets etc. (In Ten Copies) Including soft copy.  Driving of 90 mm dia bore holes |  |  | | |  | | **Rmt.** |  |
| (i) upto 10m from below Ground Level | 261 |  | | |  | | **Each** |  |
| (ii) Beyond 10m below Ground Level | 802 |  | | |  | | **Each** |  |
| 2 | While drilling bore, collection of undisturbed / disturbed soil samples and conducting of S.P.T. as below.  Collection of SPT or rock core or tube distubed samples of 50 mm dia and preferably 50 cms. Length in entire region to observe and recorded detailed soil classification at every 2mtr. Interval upto 5mtr. BGL |  |  | | |  | |  |  |
| (i) upto 10m from below Ground Level | 62 |  | | |  | | **Each** |  |
| (ii) Beyond 10m below Ground Level | 152 |  | | |  | | **Each** |  |
| 3 | Collection of un-disturbed samples of 100 mm dia and 45 to 50 cm length in tube with area ratio preferably below 10% and in any case not more than 15% tentatively in soft clay / Cohesive soil region at from BGL to completion of bore hole. |  |  | | |  | | **Each** |  |
| (i) upto 10m from below Ground Level | 155 |  | | |  | | **Each** |  |
| (ii) Beyond 10m below Ground Level | 380 |  | | |  | | **Each** |  |
| 4 | Conducting of standard penetration test in sandy strata or changed in strata from BGL to end of boring. |  |  | | |  | |  |  |
| (i) upto 10m from below Ground Level. - | 93 |  | | |  | | **Each** |  |
| (ii) Beyond 10m below Ground Level | 228 |  | | |  | | **Each** |  |
| 5 | Field / Laboratory test on soil or rock samples as collected above |  |  | |  | | |  |  |
|  | (a) Natural moisture contents and bulk density to be determined at site |  |  | |  | | | **Each**  **Each** |  |
| (i) upto 10m from below Ground Level. - | 310 |
| (ii) Beyond 10m below Ground Level | 760 |
|  | (b) Atterberg's limits I.e. LL, PL and SL |  |  | |  | | |  |  |
| (i) upto 10m from below Ground Level. - | 248 |  | |  | | | **Each** |  |
| (ii) Beyond 10m below Ground Level | 608 |  | |  | | | **Each** |  |
|  | (c) Grain size analysis inclusive of fraction passing 75 micron through pipette method i.e. individual percentages of silt and clay to be determined wherever passing, 75 micron exceeds 10% |  |  | |  | | |  |  |
| (i) upto 10m from below Ground Level. - | 558 |  | |  | | | **Each** |  |
| (ii) Beyond 10m below Ground Level | 1368 |  | |  | | | **Each** |  |
|  | (d) Determination of organic matter, P.H. values sulphates and chloride contents & specific gravity. | 138 |  | |  | | | **Each** |  |
|  | (e) un-confined compressive strength | 535 |  |  | | | | **Each** |  |
|  | (f) consolidation and shear strength represented as cohesion. (using Triaxle/Lab van shear method) The sample to be consolidated to deviator stress of equivalent to the insitu over Burdon (As per depth) and Horizontal stress during test may be maintained at 50% thereof.  Note :- The sample drained during consolidation for about 7 days so as to complete primary consolidation then tested accordance with IS-2720 (Part-12) 1981 and results represented along with graph plotting for total / effective stress towards finding of C-O and C'-O. | 535 |  |  | | | | **Each** |  |
|  | (g) Consolidation test under a pressure greater than a maximum effective verticals pressure which occur in situ due to over burden.  Note :- Test to be carried out in accordance with IS-2720(Part-15) of 1986 and results presented with set of curves provided therein. Also value of compression index (Cc) required to be reported along with co-efficient of compressibility (qv) and cc-efficient of consolidation (cv). | 535 |  |  | | | | **Each** |  |
| 6 | Test on Rock samples |  |  |  | | | |  |  |
|  | (i) Determination of unit weight of rock | 138 |  |  | | | | **Each** |  |
|  | (ii) Determination of porosity and water absorption of rock | 69 |  |  | | | | **Each** |  |
|  | (iii) Determination of rock crushing strength (compressive) | 69 |  |  | | | | **Each** |  |
|  | (iv) Point load test on rock sample | 69 |  |  | | | | **Each** |  |
|  | (v) Elastic modulus of rock samples (Tensile strength). | 69 |  |  | | | | **Each** |  |
|  | (vi) Determination of rock Hardness & Abrasiveness test (slack durability). | 69 |  |  | | | | **Each** |  |
|  | Note :- The factual report will include an introduction out lining the objectives of the investigation, finding of field and laboratory investigation like Total core recovery, Rock quality digitation (R Q D),Fracture Index. |  |  |  | | | |  |  |
| 7 | Mobilization and de-mobilization of all equipment, insurance costs and all other incidental expenditure arising out of or in connection with the contract etc.  Shifting and positioning of / jack up pontoon from one location to another location through tug or by any other suitable methods | 69 |  |  | | | | **No.** |  |
| 8 | Submission of detailed (six copies) reports for field / laboratory tests. | **LS** |  |  | | | | **LS** |  |
|  | | | | | | | | **Total Rs.** |  |

**Note :- Above rates are inclusive of all taxes duties, cess , etc except GST.**

**Contractor Signature**

**Name of Work:- Marine Geotechnical Investigations at Inshore Channel,Container Terminal & MCB including Access Channel near Tuna Tekra at Deendayal Port Authority.**

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| --- | --- | --- | --- | --- | --- | --- | --- |
| **Sr. No.** | **Area/Location** | **Average Level** | | **Bottom Level for BH** | **Length of BH** | **No. of Bore Hole** | **Running Meter** |
| **Exist** | **Design** |
| 1 | Access channel(12km) | 11 | 15.5 | 20 | 9 | 22 | 198 |
| 2 | Prop. Channel (6.7 km) | 8 | 10 | 15 | 7 | 9 | 63 |
| 3 | Maneuvering area (6.1km) | 4 | 11 | 15 | 11 | 14 | 154 |
| 4 | Wifi Berth(6.1km) | 4 | 28 | 30 | 26 | 12 | 312 |
| 5 | Approach(1km) | 2 | 28 | 30 | 28 | 12 | 336 |