

SCOPE OF WORK

1. Providing lightning protection Earthing and laying of strip.

The scope includes providing lightning protection for the crane installed at GOI berth . The connection for the earth strip has to taken from the existing crane rail provided at the berth. The earth strip has to be laid along the ducts provided in the berth jetty and along the trestle with insulator.

The earthing strip shall be laid in the duct without touching the existing cables, pipes lines etc. passing through the duct. The location of the earth pit shall be at the land.

Specification for Earthing

Providing maintenance free Earthing system as per IS 3043, UL 467 & UL 96 standards. Providing maintenance free Earthing system comprises of molecularly bonded copper of 99.9% purity on low carbon steel of 3m length (1m (219 20 CU) x 3 nos), having a diameter of 20mm with copper coating thickness of 250 microns with self-coupling peg & bore arrangement with fault current withstand capability of 20 KA rms value for 1 second and I peak of 50 KA. Universal Clamp (2730 20 VA) made of SS 304 for clamping. Impact point (219 20 IP) on the bottom rod for easy insertion. Earth enhancing mineral compound (OEC 1 10) is used for improving the soil conductivity. The material shall be mineral inert to sub soil and shall not pollute the environment and non corrosive to earth rod. The material should have a resistivity less than 0.2 Ω m. It should be free from hazardous substances The mineral compound is required to have minimum 10 Kg of the total composite. Earth electrode inspection chamber with heavy duty cover should be used to cover the Earth Rod. The dimension shall be min. 210mmx 210mmx 208mm with a weight bearing capacity of 50 KN.

The life of the earth rod/plate/pipe shall be minimum 20 years and earth resistance of the installation after earthing shall be of < 1 ohm. The earthing conductor (protective conductor from earth electrode up to the main earthing terminal/ earth bus, as the case may be) shall be of GI. of at least 98% conductivity confirming to I.S. 3043, and in the form of wire or strip as specified.

The size & material of earthing conductor and nos. of earth pits are worked out after arriving the fault level of installation by the contractor .The CoPT shall provide available technical inputs to the contractor. If the data provided by the employer is

insufficient, the contractor shall collect the same from the local CEI dept., as per requirements. If any changes required by CEA/CEI etc the same is within scope of contractor. The contractor shall be responsible to prepare shop drawings for routes of complete system along with necessary calculations before execution for approvals along with location of pits as per site condition. The drawings given by employer are indicative and it shall be contractor's responsibility to achieve the necessary values for earthing. Contractor shall also incorporate necessary requirements as per local codes / approving authorities.

Following activities shall be carried out for the earthing installation.

Minimum 2 mt. center to center distance between two earth pits and the bore should be minimum 10ft deep. All earth pits of same category shall be interlinked with earthing strips. The earth conductors (GI) inside the building / built in trench shall be properly clamped / supported on the wall with Galvanized Iron clamps and Mild Steel Zinc Passivated screws / bolts. The conductors outside the building shall be laid at least 600 mm. below the finished ground level or as per site condition as approved by engineer. The earth conductors shall either terminate on earthing socket provided on the equipment or shall be fastened to the foundation bolt and / or on frames of the equipment. The earthing connection to equipment body shall be done after removing paint and other oily substances from the body and then properly be finished. For termination / connectors for the earth strip / wires; factory fabricated connectors shall be used. Braising and other local means for joining shall be not carried out. The connectors shall be tested as per BS EN 50164 : 2000. The measurement of Earthing stations shall be measured in units whereas earthing strips and wires shall be measured in rmt.