

**INSTALLATION OF SEPARATE GROUNDING SYSTEM FOR
THE CHANCERY AND THE ANNEX**

**SCOPE OF WORK
BID SCHEDULE**



SPECIFICATION

SECTION 1

GENERAL REQUIREMENTS

Administrative Provision:

Contract Method: Construct the work in accordance with the conditions of the Owner/Contractor Agreement.

Work sequence: (a) Sequence of work shall be jointly determined by contractor and U.S. Government. (b) Any or all operations may be carried out simultaneously or in any sequence subject to US Govt. approval.

Coordination: Coordinate work of various trades to assure efficient and orderly sequence of installation of construction elements with provision for accommodating items installed elsewhere.

Field Engineering: Provide field engineering services, establish grades, lines, and levels by use of recognized engineering survey practices. Site bench marks shall be accurately and safely established, maintained and cleared away upon completion of the work. Bench mark shall be related to the nearest permanent bench mark.

Summary of Work:

Work of this contract is comprised of installing a grounding system for the telephone system in the Chancery and Annex. All materials, labor, tools and equipment shall be provided by the contractor if not otherwise mentioned. All above requirements will be based on prior joint review and concurrence by the Government and the Contractor.

Contractor's other responsibility: Repair, replace items damaged by work of this contract. Dimensions provided on drawings are based on field survey drawings. Before proceeding with work, verify all dimensions and report any discrepancies.

Cutting and Patching:

Submit written request in advance of cutting or alterations which affects (a) structural integrity of any elements of project, (b) efficiency, maintenance, or safety of any operational element, (c) visual qualities of sight exposed elements (d) work of government or separate contractor.

(b) Execution: Execute cutting, fitting and patching to complete work and to fit the several parts together to integrate with other work, uncover work to install ill-timed work, remove and replace defective and non-conforming work. Inspect existing conditions, including elements subject to damage or movement during cutting and patching. Provide supports to assure structural integrity of surroundings, device and methods to protect other portions of project from damage. Provide protection from elements for areas which may be exposed by work.

Quality Control and Safety Considerations:

Maintain quality control over supplier, manufacturers, products, services, site conditions and workmanship to produce work of specified quality. Perform work by persons qualified to produce workmanship of specified quality. Assure quality of work by complying with manufacturer's instructions, submitting manufacturer's certificates, erecting complete full scale mockup as required by individual specifications.

Contractor's workers must wear shoes, hand gloves, hardhat provided by the contractor to execute the work of this contract. They must also use adequate stepladders and wear safety belts provided by the contractor while working at high altitude. For all sorts of electrical arc and gas welding contractor must obtained Hot Work Permit signed by the Post Safety Officer before commencing such work. Request for Hot Work Permit must be sent to Post Safety Officer at least 24 hours before scheduling any welding work in the building compound.

Construction Facilities and Temporary Controls:

Maintain adequate fire protection. Gasoline and other flammable liquids shall be stored in safety containers and not to be stored inside building. Do not light fires in or about premises. No part of the residence compound can be used for temporary accommodation of contractor's laborers or other personnel. The contractor shall provide and maintain all temporary stairs, ladders, ramps, scaffolds, chutes as required for the proper execution of the work. Building water and electric supply can be used by the contractor for construction purposes. No materials, rubbish or debris shall be permitted to drop free but shall be removed by use of fully enclosed transport facilities. Keep all access roads and walks clear of debris, materials, construction plant and equipment during building operation. Protect all blanking, landscaping, trees and site improvements in the area of the site work. The contractor shall take all precautions for preventing injuries to persons or damage to property. The contractor shall carry on his work so that present traveled ways are not obstructed and shall take all measures to protect the work at all times against fire, storm, theft, vandalism and other losses. The contractor shall remove temporary materials, equipment, services and construction prior to substantial completion inspection and clean and repair damage caused by installation or use of temporary facilities.

Escort/Inspection:

Contractor's workers shall be escorted to the work site and during the days work, and all escorts shall be provided by the COR. All workers, materials, tools, etc., provided for the contracted work by the contractor shall be subject to inspection at check and entry points by Security Office personnel.

The contractor shall submit a written work schedule to the COR, indicating number of days and total number of workers required to complete the work within the contracted period of the work, at least three days before the start of the work. All work timings shall be directed by the COR, depending on the availability of escorts and other unavoidable circumstances.

For work locations requiring MSG and/or other American escorts, all work schedules shall be as directed by the COR.

The total time of work done on the project shall be calculated in hours of actual work done per day and shall be based on 8 hours a day and 5 days a week work schedule, except for holidays, to calculate project completion time.

Contract Close out:

When contractor considers work has reached final completion, submit written certificates that contract documents have been reviewed, work has been inspected and the work is complete in accordance with contract documents and ready for owner inspection.

Clean interior and exterior surfaces exposed to view; remove temporary labels, stains and foreign substance, polish transparent and glossy surfaces, vacuum soft surfaces. Clean equipment and fixtures to a sanitary condition, clean or replace filters. Clean roofs, gutters, downspouts and drainage system. Clean site; sweep paved areas, rake clean other surfaces. Remove sand, mortar, and debris from surfaces, waste and surplus materials, rubbish, and construction facilities from the project and from the site. Submit all keys of locks installed in the project.

EARTHING CONDUCTORS:

All earthing conductors shall be of high conductivity copper and shall be protected against mechanical injury or corrosion.

CONNECTION OF EARTHING CONDUCTORS:

Main earthing conductors shall be taken from the earth connections at the main earthing bus to an earth electrode with which the connection is to be made. Sub-main earthing conductors shall run from the main earthing bus to the sub-distribution boards. All other earthing conductors shall run from the main or sub-distribution boards.

Excavation on earth for a normal earth Pit size is 1.0 M X 1.0 M X 3.0 M. Use 500 mm X 500 mm X 10 mm GI Plate (Plate may be use as big as possible to contact more and more area of Earth for low resistance & best result). Make a mixture of Wood Coal Powder, Salt & Sand all in equal part. Put GI Plate (EARTH PLATE) of size 500 mm X 500 mm X 10 mm in the mid of mixture. Use Double GI Strip size 30 mm X 10 mm to connect GI Plate to System Earthing of copper conductor (to be supplied by the contractor).

Use GI Pipe of size 2.5" diameter with a Flange on the top of GI Pipe to cover GI Strip from EARTH PLATE to Top Flange. Cover Top of GI pipe with a T joint to avoid jamming of pipe with dust & mud and also use water time to time through this pipe to bottom of earth plate. Maintain less than one Ohm Resistance from EARTH PIT conductor to a distance of 15 Meters around the EARTH PIT with another conductor dip on the Earth at least 500 mm deep. The earthing pit shall be a cement concrete pit. Size to e discussed during site visit.

Check Voltage between EARTH PIT conductors to Neutral of Mains Supply 220V AC 50 Hz it should be less than 1.0 Volts.

CHANCERY:

Installation of EMT conduit (USG supplied) from the earthing pit to the Chancery (north) Telephone Frame room (rm. 86a) and extend to the room next to the Telephone Frame room (rm. 86a). Install grounding bus bars 1200 Amps with space/holes for lugs connection at both the points. The bus bar shall be installed on insulators. The bus bar, insulators, lugs etc, shall be contractor supplied. Grounding wire shall be pulled thru the EMT. Pull boxes shall be installed to facilitate pulling of the ground wire. For Chancery North Side, 3 nos. grounding pit should be done, with the earthing electrode. Three connections should be

brought to telephone frame room. 2" EMT should be used for the main entry. One outdoor box should be installed outside the building at the entry point for inspection.

From the Chancery Telephone Room conduit shall be laid from the frame room to 2nd floor electrical/telephone room (rm. 280). Install grounding bus bars 1200 Amps with space/holes for lugs connection at both the points. The bus bar shall be installed on insulators. The bus bar, insulators, lugs etc, shall be contractor supplied. Grounding wire shall be pulled thru ¾" EMT. Pull boxes shall be installed to facilitate pulling of the ground wire.

From the 2nd floor electrical room EMT should be laid to the 3rd floor electrical/telephone room (rm. 380). Install grounding bus bars 1200 Amps with space/holes for lugs connection at both the points. The bus bar shall be installed on insulators. The bus bar, insulators, lugs etc, shall be contractor supplied. Grounding wire shall be pulled thru the EMT. Pull boxes shall be installed to facilitate pulling of the ground wire.

Two grounding pits on the south side of the chancery should be constructed – same specification as that of the Chancery North side. From the pit two earth wire should go to Rm. 66. All wire must be done encased in EMT conduit. From Room no. 66 the next run will be to the 2nd floor electrical/telephone room and to the 3rd floor electrical/telephone room.

All EMT installation should be done with special care that the false ceiling, fire sprinkler system and Air-conditioning duct is not damaged or hampered during the installation. The contractor might have to co-ordinate with the USAID renovation project.

All fixing clamps for the EMT including rawl bolts should be contractors responsibility.

Annex:

Two grounding pits on the atrium side of the Annex should be constructed – same specification as that of the Chancery. From the pit two earth wires should go to Annex – Rm. 129, Warehouse/Medical closet (same location), rm. 114, rm. 180, rm. 150, and rm. 143. Install grounding bus bars 1200 Amps with space/holes for lugs connection at both the points. The bus bar shall be installed

on insulators. The bus bar, insulators, lugs etc, shall be contractor supplied. Grounding wire shall be pulled thru the EMT. Pull boxes shall be installed to facilitate pulling of the ground wire. 2" EMT should be used for the main entry. One outdoor box should be installed outside the building at the entry point for inspection.

All wiring must be done encased in ¾" EMT conduit. All EMT installation should be done with special care that the false ceiling, fire sprinkler system and Air-conditioning duct is not damaged or hampered during the installation. All fixing clamps for the EMT including rawl bolts should be contractors' responsibility.

Any work/civil works required to complete the total grounding system shall be deemed to be included in the contractor's price.

RATES & PRICE:

Sl. No.	Description of the Item	Unit	Qty	Unit Price	Total Price
1.	Earthing Pit, electrode drive within 1½" metal pipe upto 80 feet underground, Supply of plate, electrode, copper etc. included. All civil works included. The grounding wire to be terminated at the busbars.	Ea	9		
2.	Supply and installation of copper bus bars 1200 Amps. The bus bars shall be installed on insulators. All termination lugs, insulator and other material is contractor supplied. The bus bars shall be not less than 12" in length.	Ea	20		
3.	Installation of outdoor type box for inspection of connections for the grounding system	Ea	6		

4.	Installation of 2" EMT layout and ground conductor pulling from the pit to the main distribution box. Distribution box and EMT USG supplied, installation by contractor	Rft	460
5.	Installation of ¾" EMT with fittings, fittings and EMT, pull boxes USG supplied, fixing bolts, nuts screws etc. contractor supplied. This includes pulling of earth conductor and terminating at the busbar end.	Rft	4,000
6.	Installation of ¾" flexible metal conduit and pulling of ground wire. Materials USG supplied.	Rft	300

Total: