CHAPTER 2

Scope of Work

TABLE OF CONTENTS

1. GENERAL

A general description of the broad scope of work, relating to works covered in this Tender, is given below. It shall, however, be clearly understood that the description is for the purpose of general guidance only and is not exclusive. For complete appreciation of the Scope, the Specifications, Bills of Quantities along with their Explanatory notes, Drawings and other relevant paragraphs of the Tender documents shall be referred to.

1.1 Items of work

The following items of work are within the Scope of this Tender:

a) Supply and Erection of 33 kV Insulated cables in Underground & adjoining stations of Underground in tunnel/ and at other places as detailed in subsequent paragraphs.

b) Supply and Erection of 33 kV / 415 V Auxiliary Transformers and associated Switchgear and Equipment in all ASS's, in Underground Stations.

c) Modification works, as required, at the relevant already erected installations.

d) All Testing, integrated testing, and Commissioning of all erected equipment.

e) Contractor will be required to provide SCADA system according to latest standards and specifications. The design of the SCADA should be prepared and submitted to Engineer in charge for approval. All the equipments, cables, connectors, links, connections, interface devices etc required for the successful operation of the underground SCADA system has to be provided by the ROCS contractor. The price of the SCADA system is included in the ASS works BOQ of this document.

f) To enable implementation of SCADA system for the Rigid OCS and Switching Posts ROCS contractor has to make all necessary interface. The SCADA system proposed may be compatible/ integrated with the existing SCADA system of Jaipur 1A, all the details of existing system has to be arranged by the contractor (ROCS contractor to note that at present operating section of Jaipur phase-1A ABB SCADA system is provided). The entire local works and connectivity upto Operational control centre has to be maintained by ROCS contractor. Suitable OFC Communication cable/ link between all Rigid OCS, and TSS equipments shall be provided by JP/EW/1B/E2 contractor.

1.2 Corridors Covered by this Tender

This Tender covers the relevant works in the Underground Sections of the chand pole to Badi Chaupar.

2. SCOPE

2.1 General

In general, JP/EW/IB/E2 Contractor is responsible for all works relating to 33 kV Power Distribution Network and Auxiliary Substations & SCADA in the various Corridors, except for certain items of work which are specifically excluded from theJP/EW/1B/E2 Contractor's Scope and which would be carried out by other Contractors/Agencies.

2.2 JP/EW/IB/E2 Contractor's Scope

S.NO	NAME OF CORRIDOR	SCOPE
1	UNDERGROUND CHAND POLE TO BADI CHAUPAR	33 KV CABLE NETWORK AND ASS & SCADA INTEGERATION
	MODIFICATION WORKS	AS PER REQUIREMENTS

2.2.1 Auxiliary Main Substations (AMS)

JP/EW/1B/E2 Contractor's Scope of Work.

2.2.2 Auxiliary Substations (ASS)

2.2.2.1 The following works shall form part of this Tender:

Supply, erection, testing and commissioning of all equipments at all Underground ASS's, including, but not limited to,

- 33 kV / 415 V transformers
- 33 kV Switchgear
- 33 kV and Control Cables
- 33 kV Cables inside the ASS
- All control cables required for ASS
- All LT cables reuqired for interconnection of equipments etc in the ASS (excluding those required for connection from 415V side of Auxiliary Transformer)
- All measuring and protective devices
- Batteries and battery chargers
- Cable paths and earthing

- SCADA work of ASS as well as underground traction (ROCS) for the sections.
- Safety equipment and all other items required for successful and satisfactory working of the ASS, at all ASS's.

2.2.2.1.1 Tentatively, the following list shows the number of ASS's in the ***c***orridor

Sr. No.	Line Ref.	Name of Corridor	ASS's		Remarks
			Elevated	Underground	
1	Line-	Chand pole to Badi chaupar	--	2	

(Documents and Manuals :- The contractor shall have to supply, in English language, all the following drawings and documents according to the time table defined below which may be modified according to the contractual planning of the equipment supply.

2.3 Two months after the order

- One short bill of quantities for the supplies, with the precise limits of each interfaces.
- one overall planning of the stations execution
- for all high, medium and low voltage equipment:
  - final overall dimensions drawings
  - handling drawings
  - detailed installation drawings
- civil engineering and outfitting guide drawings
- detailed construction timetable, precisely defining the various equipment construction stages
- a list of general purpose apparatuses so as to reduce as much as possible, the different types required

Under no circumstance may the various detail modifications required for perfecting of the installations and requested within 1 month after supply of the drawings entitle the manufacturer to delay the delivery or to ask for a price increase of his supply.

2.4 Four months after the order

For all high, medium and low voltage equipment

- final schematic diagram

For the whole equipment of the OCC room, a detailed study defining:

- the layout of the part of the room under its responsibility
- the dimensions, colours and perspectives views of the console
- The appearance of the mimic panel with the monitoring devices
- The dimensions of the desk.

2.5 Six months after the order

- the wiring diagrams for the whole installations, including the schematic diagrams and the execution diagrams of the grounding circuits and of the interlocking
- the general assembly and operating manuals for the whole equipment
- a general guide for preventive maintenance of the various pieces of equipment
- a complete list of sub-contractors

The selection of these suppliers is at the manufacturer discretion and entirely under his responsibility. No approval that may have been given to him, in this respect, might release him from any of his responsibilities.

2.6 Nine months after the order

For the ASS in its final form

- the complete list of the auxiliary apparatuses
- the general maintenance guide
- the station descriptive manual
- the station manoeuvring manual

2.7 Three months before in-plant acceptance of the first equipment

- detailed set of the high, medium and low voltage equipment and of the power transformer drawings, in their final form:
- overall dimensions
- handling
- schematic and wiring diagrams

- detailed drawings of each auxiliary
- electrical and mechanical interlocking diagrams
- detailed part list

The manufacturer shall have to supply an absolutely complete list of the apparatus component parts with their referencing and their drawing number so as to enable setting-up the supplies and spare store general listing (in form of computerised list). The manufacturer shall supply the relevant catalogues and subscription to the updating for each part of these catalogues.

- detailed operating manuals of all accessories, auxiliaries and special tooling
- detailed manuals of preventive maintenance specific to each apparatus
- a recapitulative note specifying the transportation modes, the various handling methods and the storage precautions

If the manufacturer deems it necessary to carry out additional modifications after supply of the documents and data required above, he shall notify this as soon as possible and request approval.

This shall in no event be a justification for extension of the construction time he must comply with in all cases.

2.8 One month after in-plant acceptance tests of each piece of equipment

The manufacturer shall deliver the related detailed certificate and the detailed test report.

2.9 One month after putting into service

All documents whose updating will have been required so as to bring them in accordance with the actual works executed on the site and during testing and commissioning of the stations shall have to be supplied to the Employer for updating their documentary files

The manufacturer shall be responsible for the production of the documentary files. The structure of these files shall be defined at the beginning of the study; a systematically updated and re-issued table of contents shall be produced and included with each supply or additional documents.

The manufacturer shall have to supply entirely all the various files including folders, insets filing boxes, etc.

The manufacturer shall have to define, for each apparatus, the required maintenance operations: lubrications, checking or replacement of wear parts, etc. and shall indicate the following for each of these apparatus:

- the frequency
- the process: locking, drainage, pre-disassembly, etc.
- the special tooling required
- the personnel qualification and quantity requirements
- the approximate duration

2.10 As Built Drawings

The contractor shall prepare the as built and other drawings defined as:

- As built drawing depicting the completed works that have been certified as complete.
- Shop drawings containing information related to the permanent works.
- Working drawings containing information related to the temporary works depicting the construction of permanent works.

2.11 Electronic Drawing Format

All the drawings shall be prepared in AUTOCAD 2015 or the latest which shall be compatible with window 2007/2008.

3. SUMMARY

The work to be performed shall include but not be limited to:

- Providing the required 25 kV/ 33KV cable path from TSS to Feed FP's / ASS in Underground Sections, 25 kV cable bracket, ETS cable bracket, TEW brackets in the tunnel etc.
- Supply and installation of a duplicate 33 kV Auxiliary Power Network, in Underground portions and in specified elevated/ramp sections, continuous to Underground Secitons,
- Supply, installation, testing and commissioning of 33kV/415-Volt Auxiliary Substations, in Underground Stations,
- Provision of all the construction drawings, documents, and as-built drawings required to supply, install, test and commission the above installations.
- Supply of spare parts, tools and equipment for Power Supply;
- Deal and resolve in co-ordination with the employer/Employer's Engineer the Interface with other Contractors to ensure timely completion of the Works;
- Ensure Technology Transfer and Training to Employer's staff.

Note the entire installations shall :

- be realised to withstand the atmospheric pollution and ambient conditions furnished in General specifications relevant to the location where installed;
- meet the protective provisions relating to electrical safety;
- meet design requirements of fire safety in accordance with NFPA-130 Standard for Fixed Guide-Way Transit System, 1997 edition, except where amended by this TS.
- Meet the design requirements of Electromagnetic Compatibility in accordance the EN standard 50121-1 to 5 and EN 61000 series.
- Meet the Project Safety and Environment requirements as per "SHE manual".