

## **SECTION B**

### **EMPLOYER'S REQUIREMENTS - FUNCTIONAL**

#### **OBJECTIVE**

The objective of the Contract is the design, construction completion and commissioning of the permanent works by the Contractor (including without limitation, the design, installation and removal of the Temporary Works) and the rectification of defects appearing in Permanent Works in the manner and to the standards and within the time stipulated by the Contract. In full recognition of this objective, and with full acceptance of the obligations, liabilities and risks which may be involved, the Contractor shall undertake the execution of the Works.

#### **1. GENERAL**

- (1) The design and performance of the Permanent Works shall comply with the specific core requirements contained in these Employer's Requirements –Functional (Section B).
- (2) The design of the Permanent Works shall be developed in accordance with these Employer's Requirements - Functional, the Contractor's Technical Proposals, submitted along with this tender and the other requirements of the Contract.
- (3) The Permanent Works shall be designed and constructed to the highest standards available using proven up-to-date good practice. The Specification shall in any case not specify standards which, in the Engineer's opinion, are less than or inferior to those described in the Outline Design and Construction Specifications contained in the Tender Documents. Construction shall be carried out employing the procedures established by the Contractor in his Quality, Safety and Environmental management plans.
- (4) The Contractor shall be responsible for obtaining all necessary approvals from the relevant agencies in the design and construction of the Works.

#### **2. SCOPE OF WORKS**

- (1) The Permanent and Temporary works shall comprise Design and Construction of all Works and services for the Central Park Depot of the Project. The work content in this contract consists of, but not limited to, supplying all labour, materials, tools, plants and necessary machinery as required to completely execute all works relating to;

Detail Design and Construction of following buildings and site; and the supply, provision and installation of Plant and Equipment at the Central Park Depot:

- (i) Administrative Building inclusive of Operations Control Centre (OCC) and Depot Control Centre (DCC).
- (ii) Workshops for Inspection and Repair of Metro Train.
- (iii) Stabling shed for Stabling of Metro trains.
- (iv) Engineering Train Unit Stabling, Inspection and Cleaning facilities.

- (v) Inspection, Workshop and Train Wash Pits.
- (vi) Covered Offices for Inspection and Repair Workshops.
- (vii) Driver Sign-on Quarters and Lobby.
- (viii) Time Office and Security Building.
- (ix) Depot Stores (DCOS) and Commercial Development Building
- (x) Storage facility for inflammables.
- (xi) Canteen building with fit out and furnishings
- (xii) Permanent way Storage.
- (xiii) Underground water tanks and pump room.
- (xiv) Overhead water tank.
- (xv) Effluent treatment plant and room.
- (xvi) Roadways and Parking (including clearways for Emergency Vehicles, and Patrolling)
- (xvii) Site access and Walkways
- (xviii) Boundary walls and Fencing
- (xix) Services
  - Electrical (Illumination and Power distribution) including laying of LV cables from sub-station to all buildings with of all distribution boards, protection circuits and devices, meters, switches along with alternate and earthing connections; and
  - Plumbing (water supply, soft water, treated water, storm water, sewage and effluent and compressed air).
  - Communications (Cable galleries/conduits for Integrated access control system, Public address system, telephone, LAN and CCTV)
- (xx) EOT and JIB Cranes for Workshops, EOT crane for Electromotive Train Unit (ETU) and Monorail for Depot Stores (DCOS)
- (xxi) Compressors and compressed air lines.
- (xxii) Finishes and waterproofing of above structures and facilities.
- (xxiii) Fire fighting facilities.
- (xxiv) Ventilation, Extraction and Air-conditioning in buildings and sheds
- (xxv) Trenches, ducts, cable trays, raceways and cable tray hangers including conduits for High Voltage cables, Traction cables, Signalling and telecom, Emergency Tripping devices, LAN and optical fibre cables.
- (xxvi) Rain Water Harvesting
- (xxvii) Sustainable Landscaping

- (xxviii) Earthworks (Excavation and Fill)
- (xxix) Not Used
- (xxx) Not Used
- (xxxix) All materials and supply shall be under this contract excepting 3rd rail, OCC and DCC Equipment, Signalling.
- (xxxii) Approval from statutory authorities.
- (xxxiii) Interfacing with other contractors — Power, trackworks, communications, signalling, rolling stock, E&M, M&P and others as advised by the Employer and Engineer.
- (xxxiv) Provision of ALL operating and maintenance spares and consumables for minimum of 2 years operations
- (xxxv) Supply, Installation and commission of Machinery and Plant (EOT Cranes, Car Washing Plant, Bogie Wash Plant, Compressors, TM Oven, and other Mobile and fixed plant and portable equipment and tooling as required within the Technical Specification.)
- (xxxvi) Survey and Investigation;
- (xxxvii) Protection and relocation of utilities;
- (xxxviii) Traffic management, restoration of pavement and road facilities, etc.;
- (xxxix) Monitoring, protection, etc. for adjacent structures;
- (xl) Temporary works and equipment
- (xli) Water Supply and storage tanks;
- (xlii) Installation and testing of Pumps incl. sump pumps and pipes for Drainage/sewerage;
- (xliii) Architectural works at the Central Park Depot;
- (xliv) Training of KMRCL maintenance staff
- (xlv) Building Intelligence Management System
- (xlvi) Supply and installation of all cables, plug and sockets for Telephone system and Ethernet Local Area Network for all buildings within the Depot area,

The work is to be constructed and maintained as per Technical Specifications, relevant Codes, Specifications of MORTH, CPWD, local and state regulations, drawings, best engineering practices and/or as directed by the Engineer.

The following are examples of works which are to be designed, supplied, installed, commissioned by other Designated Contractors, with whom the Contractor shall co-ordinate all interface requirements at design stage, during his construction and integrated testing activities. However, making provisions for all their requirements, including fixing points, openings/cut outs shall be in the scope of present contract.

- (a) Design and construction of track works in depot including plinth, ballast, sleepers, rails, etc

Works and for which a Notice has been issued.

- (6) The Contractor shall maintain all records necessary for the preparation of the As-Built Drawings. Upon completion of the Works or at such time as agreed to or required by the Engineer, the Contractor shall prepare drawings which, subject to the Engineer's agreement, shall become the As-Built Drawings. All such drawings shall be endorsed by the Contractor as true records of the construction of the Permanent Works and of all temporary works that are to remain on the site. The Contractor shall also show the locations of utilities exposed, and retained as directed.

#### **4. DESIGN INTERFACES WITH DESIGNATED CONTRACTORS**

- (1) The Contractor shall co-ordinate all design and installation work with the various Designated Contractors as described in Appendix 19.
- (2) The Contractor shall note that an interface matrix (see Appendix 19) was elaborated regarding the Kolkata East-West Corridor Metro Project. The matrix takes into account all the identified contracts that will be given to companies, systems and sub-systems. This matrix is unique but would be refined as advised by the Engineer from time to time. The Contractor shall further develop the IMP in accordance with the matrix.

This matrix includes, in X and Y, a 3-levels distribution:

- **Level 1:** the contract, for instance, Elevated stations, power supply.
- **Level 2:** the systems included in each contract, for instance in the Power Supply contract we have High Voltage, Traction Power, SCADA.
- **Level 3:** the sub-systems that compose each system, for instance the system Telecom contains TETRA radio system, CCTV, Internal Telephone, Public Address, Clock system, Access Control, Optical Fibre Cable and signalling system.
- (eventually, if needed later, a **Level 4** – sub level can be added)

The cross-marking of a cell on the matrix represents an external or internal interface between 2 companies, systems, sub-systems or sub-levels.

One interface sheet, based upon a typical sheet (Appendix 19), is created each time a cross-marking is done. Interface sheets shall be filled in by the person in charge of the respective interface, who forwards them for filing to the interface manager.

Thus, it is possible to create interface sheet collections defining precisely, exhaustively and depending on the needs the limits of a company, system, subsystem or sub-level. Each collection includes external and internal interfaces.

The Contractor shall review the IMP regularly to improve the communication and cooperation with the Designated Contractors.

#### **5. DESIGN SUBMISSIONS**

##### **5.1 PRELIMINARY DESIGN SUBMISSION**

###### **General**

The preliminary design shall provide initial design documents for review and shall be sufficiently detailed to show the main elements of the design and documents required for preparation of the definitive design. It shall also include:

- a) the quality assurance plan for design
- b) a review of the outline design criteria
- c) the submission of design manuals
- d) the submission of proposed software
- e) the preliminary off site testing recommendation
- f) the submission of specifications proposed for the work
- g) the identification of design codes and standards
- h) the CAD procedures
- i) preliminary building layout and sizing
- j) preliminary site layout
- k) an alignment review
- l) the preliminary construction methodology
- m) the design submission programme (update)
- n) the utility diversion plan
- o) proposed site surveys and other field surveys
- p) a review of permanent land requirement
- q) the preliminary ground treatment
- r) the preliminary building and structure protection proposal
- s) the preliminary monitoring plan
- t) the preliminary geological model
- u) an additional ground investigation proposal
- v) The preliminary reinstatement drawings.

## **5.2 Not Used**

## **5.3 DEFINITIVE DESIGN SUBMISSION**

### **(1) General**

The Definitive Design Submission shall be a coherent and complete set of documents properly consolidated and indexed and shall fully describe the proposed Definitive Design. In particular, and where appropriate, it shall define:

- (a) the dimensions of all major features, structural elements and members;
- (b) all materials;
- (c) potential forces and movements due to all possible loadings and actions on the structures, and their accommodation;