



DELHI METRO RAIL CORPORATION LIMITED

Remodeling work such as construction of Pit jack, Bogie turntable and shifting of Bogie Turntable Civil Works etc. at Kalindi Kunj Metro Depot for Delhi MRTS Project Phase-IV.

Contract No: CPM-8/2022/06

TENDER DOCUMENTS

VOLUME – III

EMPLOYER'S REQUIREMENTS

DELHI METRO RAIL CORPORATION LTD.

Office of Chief Project Manager-8,

Opp. Frank Anthony Public School, Lala Lajpat Rai Marg,

Lajpat Nagar-IV, New Delhi-110024

TENDER DOCUMENTS

VOLUME – 3

EMPLOYER'S REQUIREMENTS:

GENERAL

FUNCTIONAL

DESIGN

EMPLOYER'S REQUIREMENTS – GENERAL

1. INTRODUCTION

These Employer's Requirements are divided into four sections as follows:

- (a) **General:** these apply throughout the Contract.
- (b) **Functional:** these include the specific core requirements for the design and performance of the Works.
- (c) **Design:** these apply in respect of duties & requirements relating to the temporary design of the Permanent Works.

2. DEFINITIONS AND INTERPRETATIONS

In addition to the words and expressions defined in the General Conditions of Contract (GCC), further following words and expressions shall have the meaning assigned to them except where the context otherwise requires :

"As-Built Drawings": means those drawings produced by the Contractor and endorsed by him as true records of construction of the Permanent Works and which have been agreed with the Engineer.

"Combined Services Drawings" (CSD): means drawings showing the locations, layouts and sizes of all services including those of other contractors co-ordinated so as to eliminate all clashes.

"Construction Phase": has the meaning identified in Clause 4 of the Employer's Requirements - General.

"Construction Reference Drawings": means those drawings referred to in Clause 2(8) of the Employer's Requirements - Design in respect of which a Notice has been issued.

"Construction Reference Drawings Submission": means the submission of Construction Reference Drawings representing elements of the Permanent Works and for which the Contractor seeks a Notice.

"Construction Specification": means those parts of the Standard Outline Specification which relate to construction.

"Definitive Design Submission": means the submission of documents which comprise the whole or parts of the proposed Definitive Design and for which the Contractor seeks a Notice.

"Design Manual": means the manual to be prepared and submitted by The Contractor as part of the Definitive Design and as described in the Employer's Requirements - Design.

"Design Package": has the meaning identified in Clause 2(5) of the Employer's Requirements - Design.

"Design Phase": has the meaning identified in Clause 4 of the Employer's Requirements - General.

"Design Criteria": means those parts of the Standard Outline Specification which relate to design.

"Final Design": has the meaning identified in Clause 3(5) of Employer's Requirements – Design.

"Notice": means a Notice of No Objection.

"Particular Specification": means the combined specifications prepared by the Contractor in CSI format which combines the Employers Design Criteria, the Employer's Outline Construction Specifications and those parts of the Contractor's Technical Proposals which specify standards for design and construction which are developed during the Design Phase.

"Preliminary Design": means the submission of documents which comprise the initial stage of the design phase.

"Railway Envelope": means the zone or zones within the Works containing the trackwork and equipment necessary for the operation of the railway.

"Services, Electrical, Mechanical Drawings"(SEM) : means those drawings produced by the contractor executing the service works showing the locations, sizes and details for openings in structural elements for mechanical and electrical facilities and other related contracts.

"Standard Outline Specification": means the Design Criteria and the Outline Construction Specifications that specify standards issued by the Employer for development by the Contractor for design and construction.

"Specification": has the meaning identified in Clause 5 of the Employer's Requirements - General.

"Structure Gauge": means the profile related to the designed normal co-ordinated axis of the track into which no part of any structures or fixed equipment may penetrate.

"Working Drawings": comprise the Construction Reference Drawings and such other drawings and documents, such as bar bending schedules and manufacturing drawings, as are necessary to amplify the Construction Reference Drawings for construction purposes and endorsed as required by the Engineer.

3 RELEVANT DOCUMENTS

The Design Criteria shall be read in conjunction with the General Conditions of Contract (GCC), the Special Conditions of Contract (SCC), the Employer's Requirements, the Drawings and any other document forming part of the Contract.

In the event of a conflict between the Employer's Requirements and any Design Criteria, the Design criteria shall prevail. In the event of a conflict between any Design Criteria and any other standards or specifications quoted, the requirement of the Design Criteria shall prevail. Notwithstanding the precedence specified above the Contractor shall always immediately seek advice from the Engineer in the event of conflicts between Specifications.

The order of precedence is:

- (i) Design Criteria
- (ii) Employer's Requirements
- (iii) Indian and other International Standards referenced herein.
- (iv) Indian and other International Standards

4 PHASES (DESIGN AND CONSTRUCTION)

- (i) The Contractor shall temporary design of the Works.
- (ii) The Design shall commence upon the date of issue of Letter of Acceptance. This shall include the preparation and submission of design and drawings for approval.
- (iii) DELETED
- (iv) The Construction for the whole or a part of the Permanent Works shall commence immediately upon the issue of a Notice of approval of drawings by the Engineer/Employer. The Construction shall include the completion and submission of the Final Design and the preparation and submission of the As Built Drawings and other records as specified.
- (v) DELETED.

5. SPECIFICATIONS

In accordance with the provisions of these Employer's Requirements and the Specifications contained in the Contract.

6. SPECIFICATIONS IN METRIC AND IMPERIAL UNITS

- (i) The Contract shall utilize the SI system of units. Codes and Standards in imperial units shall not be used unless the Engineer has given his consent.
- (ii) Conversion between metric units and imperial units shall be in accordance with the relevant Indian Standards.

7. DELETED

8. DELETED

9. DELETED

10. DELETED

11. CO-ORDINATION WITH DESIGNATED AND OTHER CONTRACTORS

General

The Contractor is responsible for detailed co-ordination of his construction activities with those of the Designated Contractors, Civil Contractors, Utility Agencies, Statutory Authorities, Private Service Providers, Developers, Consultants and other Contractors whether or not specifically mentioned in the contract, that may be working on or adjacent to the site for the purpose of the Project.

12. SURVEY AND SITE INVESTIGATIONS

- (i) The datum used for the Contract shall be Mean Sea Level Datum.
- (ii) The Contractor shall carry out all further site investigations necessary for the design of the Permanent Works and to enable the determination of the methods of construction and the nature, extent and design of the Temporary Works.

13. CLIMATIC CONDITIONS

Delhi experiences extreme climatic conditions and tenderers must acquaint themselves about the same before submitting the tender. The Employer shall in no way be responsible on this account.

14. DELETED

15. DELETED

16. DELETED

EMPLOYER'S REQUIREMENTS - FUNCTIONAL

Objective

The objective of the contractor is to **Remodeling work such as construction of Pit jack, Bogie turntable and shifting of Bogie Turntable Civil Works etc. at Kalindi Kunj Metro Depot for Delhi MRTS Project Phase-IV** 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

- 1.1 The performance of the Works shall comply with the specific core requirements contained in these Employer's Requirements - Functional.
- 1.2 The Works shall be developed in accordance with these Employer's Requirements - Functional, the Contractor's Technical Proposals and the other requirements of the Contract.
- 1.3 The Works shall be constructed to the highest standards available using proven up-to-date good Engineering practices. 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 Technical/ Construction Specifications contained in the Tender Documents.
- 1.4. The Contractor shall be responsible for obtaining all necessary approvals from the relevant Public/Government/Local/Statutory or any agencies in the design and construction of the works.

2. SCOPE OF WORKS

2.0 GENERAL

Name of Work: Contract CPM8/2022/06 Remodeling work such as construction of Pit jack, Bogie turntable and shifting of Bogie Turntable Civil Works etc. at Kalindi Kunj Metro Depot for Delhi MRTS Project Phase-IV

WORK CONTENT

2.1.1 Brief Scope

The scope of work, inter-alia, includes the following but not limited to:

- a) Barricading and securing the site.
- b) Construction of a RCC Pit jack, bogie turntable, grade slab, dismantling and re-erection of inspection platform and shifting of bogie turntable etc. including earthwork in excavation,(by H-pile method) all foundations and other RCC structures as per relevant BOQ items and plan provided by DMRC in tender drawings.
- c) Work to be carried out as per approved drawings (Good for Construction) only.
- d) All work shall be carried as per CPWD specification (Civil 2019 & Technical specification of DMRC in volume-III).
- e) The contractor shall be responsible for completion of the above said work in all respect. The contractor shall ensure the presence of the qualified and experienced Engineer during execution of work for smooth completion of work at site. Provision for fixing E&M equipments in the structure is also included in scope of work with due interface with respective System Contracts.
- f) For the items not specified in the BOQ, shall be carried under Any Other DSR 2021.
- g) The work includes architectural finishes comprising of plaster, painting, flooring, finishing, work, steel work etc. complete as per relevant BOQ items.
- h) The work under this contract shall consist of, but not limited to all materials, labour, equipment's, tools, plants and necessary machinery as required to completely execute all the works relating to Architectural finishes and shall be paid on item rate basis under relevant heads of schedules of BOQ.

- i) Cost of manpower for execution, safety, quality etc are included in the BOQ value. Tenderer shall quote the rate accordingly.
- j) Demolishing of existing structures, roads, utilities and other services required for the execution of work, diversion of chartered utilities and/or support of chartered as well as unchartered utilities.
- k) Survey, instrumentation, ground treatment, ground monitoring, risk analysis, settlement prediction, preventive and corrective actions.
- l) Traffic management along the worksites including works like road works, footpaths & other services required in connection with traffic management and maintenance during construction period. Also, reinstatement to original condition where ever road/diversion has been made outside original road. The payment will be made separately for this work under relevant DSR/non DSR 2021 items of BOQ.
- m) Sufficient number of dewatering systems with drainage pump arrangements shall be provided at all work sites, if required. Cost of the same is included in the BOQ. No extra payment will be made on this account.
- n) All aspects of quality assurance, including testing of various components of the work, as specified or as directed. Quality testing of materials shall be done by Third party Lab (NABL Accredited) which is approved by DMRC and the same is inclusive of cost quoted by contractor. Nothing extra shall be payable on this account from DMRC.
- o) The work inter-alia includes the requisite measures for leaving the site in tidy condition. Clearing of site after work and handing over of all the works, as specified and as directed.
- p) Repair of defective work during the Defect liability period without any extra cost.
- q) Any other item of work as may be required to be carried out for completing the work including all necessary interfaces works with DMRC & authorities in all respects in accordance with the provisions of the Contract and or to ensure the safety of the work during and after construction.

2.1.2 The value of the work shall be on item rates accepted in letter of acceptance subject to such additions thereto or deductions there from as may be made under the provisions of the Contract.

The rates are inclusive of all cost but not limited to the cost such as for Plants, Equipments, tools, all types of labour, supervision, all materials from the source of supplies as approved by Engineer/Employer including all lead and lifts, transport, all temporary works, erection, maintenance, contractors profits & establishment/overheads together with, all general risks, taxes, royalties, duties, cess, octroi and other levies, insurance liabilities and all other obligations set out or implied in the contract for completion of work except otherwise specified in Bill of Quantities.

2.2 Interface Work

- (i) In addition the Contractor shall be required to accommodate requirements of DMRC and miscellaneous works as per interfacing requirements.
- (ii) Earthing and lighting protection wherever required.

2.3 DELETED

2.4 Inspection

DMRC may appoint an agency to ensure the quality checking of design, supply, fabrication, erection and construction of all works under scope of work. The Contractor shall ensure the complete co-operation with the agency to perform their work satisfactorily. In addition, DMRC also reserves right to undertake quality check and inspection directly by itself.

2.5 Design Life

The design life of all the Permanent works shall be 100 years.

2.6 REFERENCE TO THE STANDARD CODES OF PRACTICE

- 2.6.1 All Standards, Technical Specifications and Codes of practice referred to shall be latest editions including all applicable official amendments and revisions. The Contractor shall make available at site all relevant Indian Standard Codes of practice and IRSC & TRC Codes as applicable.

Wherever Indian Standards do not cover some particular aspects of design/construction, relevant British German Standards will be referred to. The Contractor shall make available at site such standard codes of practice.

In case of discrepancy among Standard codes of practice, Technical Specifications and provisions in sub clauses in this NIT, the order of precedence will be as below:

- (i) Provision in NIT
- (ii) Technical Specifications,
- (iii) CPWD specifications
- (iv) Standard Codes of Practice.

In case of discrepancy among Standard Codes of Practice, the order of precedence will be IRS, IRC, IS, BS, DIN

2.7 DIMENSIONS

- 2.7.1 As regards errors, omissions and discrepancies in Specifications and Drawings, relevant clause of Special Conditions of Contract will apply.
- 2.7.2 The levels, measurements and other information concerning the existing site as shown on the conceptual / layout drawings are believed to be correct, but the Contractor should verify them for himself and also examine the nature of the ground as no claim or allowance whatsoever will be entertained on account of any errors or omissions in the levels or strata turning out different from what is shown on the drawings.

2.8 DELETED

2.9 ASSOCIATED WORKS

Works to be performed shall also include all general works preparatory to the construction and works of any kind necessary for the due and satisfactory construction, completion and maintenance of the works to the intent and meaning of the drawings adopted and technical specifications, to best Engineering standards and orders that may be issued by the Engineer from time to time, compliance by the agency with all Conditions of Contract, supply of all materials, apparatus, plants, equipment, tools, fuel, water, strutting, timbering, transport, offices, stores, workshop, staff, labour and the provision of proper and sufficient protective works, diversion, temporary fencing, lighting and watching required for the safety of the public and protection of works on adjoining land; first –aid equipment, sanitary accommodation for the staff and workmen, effecting and maintenance of all insurances, the payment of all wages, salaries, fees, royalties, duties or the other charges arising out of the erection of works and the regular clearance of rubbish, clearing up, leaving the site perfect and tidy on completion

2.10 DELETED

2.11 SPACE FOR TEMPORARY OFFICE & STORAGE

Contractor shall manage the land area for storage of materials as per requirement. No payment will be made on account of developing the area for storage/stacking purpose. Contractor shall provide temporary office for DMRC staff at their own cost, also maintaining the office.

2.12 DELETED

2.13 DELETED

3.0 Site Information

3.1 Work Site

3.1.1 The project site is located in the National Capital Territory of Delhi and NCR. The location of the work is near Yamuna Bank Metro station of DMRC Blue line.

3.1.2 The contractor shall plan his works keeping in view restriction of approach and availability of space and time.

4.0 Stage Payment for E&M works

DELETED

EMPLOYER'S REQUIREMENTS - DESIGN

1. INTRODUCTION

- (i) The Employer's Requirements - Design, specifies the procedural requirements for the preparation of the design of the Permanent/temporary Works. These requirements are subdivided into those that are to occur during the Design Phase, those that are to occur during the Construction Phase, and those that are of general application.
- (ii) In addition to the express requirements herein, the Contractor shall, whenever the Engineer so requests, provide information and participate in discussions that relate to design matters.
- (iii) The Contractor shall engage the Designer from the list approved by DMRC who shall undertake and prepare the design of the Permanent/ Temporary Works as per applicable Indian standard Code. Contractor can appoint DDC other than the list provided by DMRC with prior approval of DMRC. For this, Contractor shall submit credentials of DDC as per DMRC requirement to get the approval of DMRC.
- (iv) The Contractor shall ensure that the Designer continues to be represented in Delhi at all times by staff whose seniority and experience are to the satisfaction of the Engineer and whose representative is available on the Site as necessary or as required by the Engineer.

2. DELETED

3. DELETED

4. DELETED

5. DELETED

6. DESIGN SUBMISSIONS - CONSTRUCTION REFERENCE DRAWINGS SUBMISSIONS

- (i) The Construction Reference Drawings shall be derived directly from the Definitive Design and shall detail and illustrate in full the Permanent/Temporary Works. The Construction Reference Drawings shall form part of the Working Drawings to be used for construction purposes.
- (ii) Prior to any Construction Reference Drawings Submission, the Contractor shall prepare a full list of Construction Reference Drawings in order to demonstrate, to the satisfaction of the Engineer, that such Construction Reference Drawings will be sufficient in extent to cover the construction of the whole of the Permanent Works.
- (iii) DELETED.

7. DESIGN SUBMISSIONS - CONSTRUCTION PHASE

- (i) On the issue of a Notice in respect of the Construction Reference Drawings the Contractor shall produce the proposed Working Drawings. These shall either be identical to the Construction Reference Drawings or shall be further drawings developed in accordance with the Construction Reference Drawings such as site sketches, bar bending schedules, bar reference drawings, fabrication and shop drawings, construction erection sequences and the like. All such drawings shall comply with the requirements of the Contract.
- (ii) Prior to submission of the proposed Working Drawings, the Contractor shall endorse the appropriate original paper drawings as "Good for Construction". If the Engineer so requires, the endorsed original shall be submitted to the Engineer who shall, if he has no objection to the contents of the submission, further endorse the original by stating that he has no objection to the proposed Working Drawings. On the endorsement by the Engineer, the

original will forthwith be returned to the Contractor as the Working Drawings.

- (iii) Only the Working Drawings endorsed as in 7(ii) above or those that the Engineer has expressly stated as not requiring his endorsement shall be issued to the Site. The Construction of the Works shall be strictly in accordance with these Working Drawings.
- (iv) The Contractor shall finalise details of the proposed method of construction and submit such finalised details to the Engineer for review. The proposed method shall have no adverse effects on the partially completed Permanent Works and shall ensure the Works are statically and, if appropriate, aerodynamically stable.
- (v) The Contractor shall undertake and submit a stage by stage construction sequence and the effect of any Temporary Works and the Contractor's Equipment on the Permanent Works. This analysis shall be in sufficient detail to demonstrate that the Contractor's proposals are safe and have no adverse effects upon any parts of the Permanent Works.
- (vi) As-Built Drawings, endorsed by the Contractor shall be submitted to the Engineer for agreement in accordance with **Clause 5.6** of the GCC.

8. DESIGN SUBMISSIONS - REVIEW PROCEDURES

- (i) Submissions of Design Data shall be made and reviewed by the Engineer. The form and detail of the review shall be as determined by the Engineer and will not release or remove the contractor's responsibility for the design under the contract.
- (ii) The issue of a Notice shall be without prejudice to the issue of any future Notices.
- (iii) The Contractor shall, prior to the submission of the Design Data, obtain all required and/or statutory approvals that relate to that submission including, where appropriate, the approval of the Concerned Government Authorities and utility undertakings, and demonstrate that all required approvals have been obtained.
- (iv) All submissions shall be accompanied by two original copies of a 'Design Certificate' as set out in **Attachment D1** hereto and signed by the Contractor and the Designer.

9. DELETED.

10. DELETED.

11. CALCULATIONS

- (i) Unless otherwise required by the Engineer, calculations relevant to the Definitive Design and Construction Reference Drawings shall be submitted for review with the respective Design Packages or Submissions. The Engineer may require the submission of applicable software including in house software programmes/ worksheets developed by the Contractor, computer input and programme logic for its review prior to the acceptance of the computer output.
- (ii) The Contractor shall prepare and submit a comprehensive set of calculations for the Definitive Design in a form acceptable to the Engineer. Should the design of the Permanent Works be revised thereafter and such revision renders the calculations as submitted obsolete or inaccurate, the Contractor shall prepare and submit the revised calculations
- (iii) Similarly, the Contractor shall submit such further calculations as have been prepared in connection with the Construction Reference Drawings.
- (iv) Calculations to be included as part of the submission herein shall comprise the up-to-date calculations in respect of the Definitive Design, the Construction Reference Drawings and such further calculations which the Contractor has prepared during the production of Working Drawings.

- (v) The Contractor shall submit all calculations necessary to support proposals relating to the construction methods.

12. DOCUMENTS REQUIREMENTS

- (i) Drawings shall be prepared generally to A1 size, but to ISO AO size where appropriate.
- (ii) The Contractor shall submit 3 copies of his design and/or drawings for review by the Engineer. After receipt of "No Objection" from the Engineer's Representative, the Contractor shall submit 3 copies of design and/or drawing for the use of the Engineer.
- (iii) The submission of drawings may be by CAD Media files.
- (iv) The contractor to provide one licensed working software copy being used by its DDC to design department maintained for the entire contract period.

ATTACHMENT D 1

• DESIGN CERTIFICATE

This Design Certificate refers to design submission no. , which comprises of Definitive Design submission / Construction Reference Drawings submission, working drawing submission scheduled in the attached transmittal, in respect of:

(Description of Permanent Works to which the submission refers)

DESIGNER'S STATEMENT:

We certify that:

- a) the outline designs, design briefs and performance specifications of those elements of the Permanent works as illustrated and described in the documents scheduled in the attached transmittal, complies with the Outline Design Specification (ODS) and other contract provisions.
- b) an in-house check has been undertaken and completed in accordance to approved Quality Assurance Plan (QAP) to confirm the completeness, adequacy and validity of the design of the Permanent Works as illustrated and described in the documents scheduled in the attached transmittal.
- c) all necessary and required approval relating to the design of the Permanent Works, as illustrated and described in the documents listed in the attached transmittal, have been obtained.
- d) all effects of the design comprising the submission on the design of adjacent or other parts of the works have been fully taken into account in the design of those parts.

Signed by Designer's Authorised Representative

Name :

Position :

Date :

CONTRACTOR'S CERTIFICATE:

The Certifies that all design has been performed utilizing the skill and care to be expected of a professionally qualified and competent designer, experienced in work of similar nature and scope. This further certifies that all works relating to the preparation, review, checking and certification of design has been verified by us and the design proposed by the designer has been accepted by us vide clause 5.2 of GCC.

Signed by Contractor's authorised representative

Name :

Position :

Date :

SAMPLE DRAWING TEMPLATE

(a) 'Design Quality Assurance' by designer & contractor :

DESIGN QUALITY ASSURANCE			
The responsibility of control, check and verification of accuracy, correctness, completeness, integration and full compliance of contract provisions in respect of design analysis and drawings rests with the design consultants and the contractor.			
By Designer		By Contractor	
Sig. :	Sig. :	Sig. :	Sig. :
Date. :	Date. :	Date. :	Date. :
Name :	Name :	Name :	Name :
Designed by	Checked by	Approved by	Accepted By

(b) Notice of 'No Objection' from Employer's representatives :

Notice of 'No Objections' from Employer's Representative			
Notice of "No Objections" from Employer is being accorded for design Principles. However, the overall responsibility for the detailing and design accuracy lies with Design and Build Contractor.			
	REMARKS	Date	Signature
JE (Design)	Reviewed		
AEN/XEN (Design)	Reviewed		
Dy. CE (Design)	Reviewed		
CE (Design)	Reviewed & comments as marked on drawing		
PM-8A	Reviewed		
CPM-8	Reviewed & No objection issued with comments as marked on Drawing		

- **Section C**

[Contractor to attach copies of necessary and required approvals]