



DELHI METRO RAIL CORPORATION LIMITED

MASS RAPID TRANSPORT SYSTEM

Design & Construction Of Civil Engineering works for Construction Of Bridge Across River Yamuna on Mukandpur-Yamuna Vihar Corridor for Phase - III Of Delhi MRTS Project (Line N0.7).

CONTRACT NO: CC-03

TENDER DOCUMENTS

VOLUME 1

Notice Inviting Tender

Instructions to Tenderers (including Annexures)

Form of Tender (including Appendices)

Design Basis Report

DELHI METRO RAIL CORPORATION LTD.

5th floor,A-Wing, Metro Bhawan, Fire Brigade Lane,

Barakhamba Road, New Delhi-110001



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VOLUME 1

NOTICE INVITING TENDER

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NOTICE INVITING TENDER

1.1 GENERAL**1.1.1 Name of Work:**

Delhi Metro Rail Corporation (DMRC) Ltd. invites Open tenders from eligible applicants, who fulfill *qualification criteria* as stipulated in clause 1.1.3 of NIT for the work "Design & Construction of Civil Engineering works for Construction of Bridge Across River Yamuna on Mukandpur-Yamuna Vihar Corridor for Phase III of Delhi MRTS Project".

The detailed Scope of the work is provided in clause 2.0 and the Site information in Clause 4.0.

1.1.2 Key details:

Approximate Cost of Work	Rs. 33 Crores (Rupees Thirty Crore only)
Tender Security amount	Rs. 33 Lacs
Completion period of the Work	24 months
Tender documents on sale	From 06.06.2011 to 15.06.2011. (between 09.00 hrs to 1700 Hrs) on working days
Cost of Tender	Rs. 21,000/- (inclusive of 5% DVAT)
Last date of Seeking Clarification	22.06.2011
Pre-bid Meeting	23.06.2011 at 1500 Hrs.
Last date of issuing Addendum	28.06.2011
Date & Time of Submission of Tender	04.07.2011 (upto 1500 Hrs.)
Date & time of opening of Tender	04.07.2011 at 15.05 hrs
Authority and place for purchase of tender documents, seeking clarifications and submission of completed tender documents	Chief General Manager /Tender Delhi Metro Rail Corporation, Metro Bhawan ,Fire Brigade Lane, Barakhambha Road,New Delhi-110001

1.1.3 QUALIFICATION CRITERIA :**1.1.3.1 Eligible Applicants :**

- i. The tenders for this contract will be considered only from those tenderers (proprietorship firms, partnerships firms, companies, corporations, consortia or joint ventures) who meet requisite eligibility criteria prescribed in the sub-clauses of clause 1.1.3 of NIT. In the case of a JV or Consortium, all members of the Group shall be jointly and severally liable for the performance of whole contract.
- ii. A non-Indian firm is permitted to tender only in a Joint Venture or consortium arrangement with any other Indian firm having minimum participation interest of 26% or

- their wholly owned Indian subsidiary registered in India under Companies Act -1956 with minimum 26% participation.
- iii. Tenderers shall not have a conflict of interest. All Tenderers found to have a conflict of interest in this tender process shall be disqualified. Tenderers shall be considered to have a conflict of interest, if:
 - (a) One firm applies for tender both as an individual firm and in a Group.
 - (b) If Tenderers in two different applications have controlling shareholders in common.
 - (c) Submit more than one application in this tender process.
 - (d) If the Tenderer has participated as a consultant in the preparation of the design or technical specifications of the works that are the subject of this tender.
 - iv. A firm, who has purchased the tender document in their name, can submit the tender either as individual firm or in joint venture/Consortium.
 - v. Tenderer must not have been blacklisted or deregistered by any central / state government department or public sector undertaking. Also no work of the tenderer must have been rescinded by client after award of contract during last 10 years. The tenderer should submit undertaking to this effect in Performa of Annexure-4.

1.1.3.2 Minimum Eligibility Criteria :

Work Experience: The tenderers will be qualified only if they have completed work(s) during last seven years ending 31.05.2011 as given below :

At least one work of "Construction of a river Bridge on Well Foundation and precast pre-stressed concrete super structure" of value of Rs 26.00 crores or

- (i) *Two different works, as defined in para (i) above, each of value Rs. 17.00 crores or more or more, or*
- (ii) *Three different works, as defined in para (i) above, each of value Rs. 13.00 crores or more.*

Notes:

- The tenderer shall submit details of work executed by them in the Performa of Annexure-1 for the works to be considered for qualification of work experience criteria. Documentary proof such as completion certificates from client clearly indicating the nature/scope of work, actual completion cost and actual date of completion for such work should be submitted. *The offers submitted without this documentary proof shall not be evaluated.* In case the work is executed for private client, copy of work order, bill of quantities, bill wise details of payment received certified by C.A., T.D.S certificates for all payments received and copy of final/last bill paid by client shall be submitted.
- Value of successfully completed portion of any ongoing work up to 31.05.2011 will also be considered for qualification of work experience criteria.
- For completed works, value of work done shall be updated to 31.05.2011 price level assuming 5% inflation for Indian Rupees every year and 2% for foreign currency portions per year.
- In case of joint venture / consortia, full value the work, if done by the same joint venture or any of members of the Joint Venture shall be considered. However, if the work done by them in JV/consortium, value of work as per his percentage participation

shall be considered.

Financial Standing : The tenderers will be qualified only if have minimum financial capabilities as below :

- (i) T₁ - Working Capital (Liquidity and Bankers References) : Working Capital (Net Cash Flow) of the tenderes during last audited financial years should be \geq Rs. 2.35 crores
- (ii) T₂ - Profitability : Profit before Tax should be Positive in at least 1 (one) year, out of the last three audited financial years.
- (iii) T₃ - Net Worth : Net Worth of tenderer during last audited financial year should be \geq Rs. 3.33 crores.
- (iv) T₄ - Annual Turnover : The average annual turnover from construction of last three financial years should be \geq Rs. 13.17 crores.

Notes :

- Financial data for latest last three audited financial years has to be submitted by the tenderer in Annexure-2 along with audited balance sheets. The financial data in the prescribed format shall be certified by Chartered Accountant with his stamp and signature. In case audited balance sheet of the last financial year is not made available by the bidder, he has to submit an affidavit certifying that 'the balance sheet has actually not been audited so far'. In such a case the financial data of previous '3' audited financial years will be taken into consideration for evaluation. If audited balance sheet of any other year than the last year is not submitted, the tender will be considered as non-responsive.
- In case of Joint Venture / Consortia, the financial standing criteria will be evaluated based on weighted average of the financial data of the members as per their percentage participation.

1.1.3.3 Bid Capacity Criteria :

Bid Capacity : The tenderers will be qualified only if their available bid capacity is more than the approximate cost of work as per NIT. Available bid capacity will be calculated based on the following formula:

$$\text{Available Bid Capacity} = 2 \cdot A \cdot N - B$$

Where,

A = Maximum of the value of construction works executed in any one year during the last five financial years (updated to 31.03.2010 price level assuming 5% inflation for Indian Rupees every year and 2% for foreign currency portions per year).

N = No. of years prescribed for completion of the work

B = Value of existing commitments (as on 31.05.2011) for on-going construction works during period of 24 months w.e.f. 01.06.2011.

Notes:

- Financial data for latest last five financial years has to be submitted by the tenderer in Annexure-3A along with audited financial statements. The financial data in the prescribed format shall be certified by the Chartered Accountant with his stamp and signature.
- Value of existing commitments for on-going construction works during period of 24

months w.e.f. 01.06.2011 has to be submitted by the tenderer in Annexure-3B. These data shall be certified by the Chartered Accountant with his stamp and signature.

- In the case of joint venture / consortia, bid capacity of each member will be computed applying above formula and combined bid capacity of the joint venture / consortia will be weighted average of the individual bid capacity of the members as per

1.1.3.4 The tender submission of tenderers, who do not qualify the *minimum eligibility criteria* & bid capacity criteria stipulated in the clauses 1.1.3.2 to 1.1.3.3 above, shall not be considered for further evaluation and therefore rejected. The mere fact that the tenderer is qualified as mentioned in sub clause 1.1.3.2 to 1.1.3.3 shall not imply that his bid shall automatically be accepted. The same should contain all technical data as required for consideration of tender prescribed in the ITT.

1.1.4 The Tender documents consist of:

Volume 1

- Notice Inviting Tender
- Instructions to Tenderers (including Annexures)
- Form of Tender (including Appendices)
- Design Bases Report

Volume 2

- General Conditions of Contract

- Special Conditions of Contract (including Schedules)

Volume 3

- Safety, Health and Environment Manual (SHE) Ver 1.2

Volume 4

- Priced Bill of Quantities (BOQ)
- Specifications

Volume 5 (Drawings)

- Tender Drawings

1.1.5 The contract shall be governed by the documents listed in para 1.1.4 above along with latest edition with updated correction slips of CPWD, MORTH, IRC & IRS Specifications. These Specifications may be purchased from the market.

1.1.6 The tenderers may obtain further information/ clarification, if any, in respect of these tender documents from the office of Chief General Manager (Tender), Delhi Metro Rail Corporation, 5th floor, Metro Bhawan, Fire Brigade Lane, Barakhamba Road, New Delhi –110 001.

1.1.7 All tenderers are hereby cautioned that tenders containing any material deviation or reservations as described in Clause “E 4” of “Instructions to Tenderers” and/or minor deviation without quoting the cost of withdrawal shall be considered as non-responsive and is liable to be rejected.

1.1.8 Late tenders (received after date and time of submission of bid) shall not be accepted under any circumstances.

- 1.1.9 Tenders shall be valid for a period of 180 days from the date of submission of Tenders and shall be accompanied with a tender security of the requisite amount as per Annexure – 3 of ITT in the form of a Bank Guarantee from Scheduled Commercial Bank in India.
- 1.1.10 DMRC reserves the right to accept or reject any or all proposals without assigning any reasons. No tenderer shall have any cause of action or claim against the DMRC for rejection of his proposal.

**Chief General Manager (Tender)
Delhi Metro Rail Corporation Ltd**

ANNEXURE-1WORK EXPERIENCE

NAME OF THE TENDERER (CONSTITUENT MEMBER IN CASE OF JV/CONSORTIUM) :

1. Name of work	
2. Agreement / contract No.	
3. Client	
4. Scope / Nature of work	
5. Date of start	
6. Stipulated date of completion	
7. Actual date of completion	
8. Total value of work done on completion (up to 31.05.2011 in case of works in progress)	
9. Value of work done of component of similar work as stipulated in NIT clause 1.1.3.2.	
10. Ref to client's completion certificate	

NOTE:

1. Separate Performa shall be used for each member in case of JV/Consortium.
2. Attach copies of the audited balance sheets, including all related notes, income statements for the last three audited financial years, as indicated above.
3. All such documents reflect the financial data of the tenderer or member in case of JV/Consortium, and not that of sister or parent company.
4. *In case the work is executed for private client, copy of work order, bill of quantities, billwise details of payment received certified by C.A., T.D.S certificates for all payments received and copy of final/last bill paid by client shall be submitted.*

ANNEXURE- 2FINANCIAL DATA

(FINANCIAL STANDING)

NAME OF THE TENDERER (CONSTITUENT
MEMBER IN CASE OF JV/CONSORTIUM) :*(All Amounts In Rupees In Crores)*

S. No.	Description	Financial Data for Latest Last 3 Audited Financial Years		
		Year 2008-09	Year 2009-10	Year 2010-11
1.	Total Assets			
2.	Current Assets			
3.	Total Liabilities			
4.	Current Liabilities			
5.	Profits Before Taxes			
6.	Profits After Taxes			
7.	Net Worth [= 1 - 3]			
8.	Working Capital[=2 - 4]			
9.	Annual Turnover			

NOTE:

1. Separate Performa shall be used for each member in case of JV/Consortium.
2. Attach copies of the audited balance sheets, including all related notes, income statements for the last three audited financial years, as indicated above.
3. All such documents reflect the financial data of the tenderer or member in case of JV/Consortium, and not that of sister or parent company.
4. The financial data in above prescribed format shall be certified by Chartered Accountant / Company Auditor under his signature & stamp.

ANNEXURE- 3AFINANCIAL DATA

(CONSTRUCTION WORK DONE DURING THE LATEST LAST FIVE FINANCIAL YEARS)

NAME OF THE TENDERER (CONSTITUENT
MEMBER IN CASE OF JV/CONSORTIUM) :

(All amounts in Rupees in Crores)

S. No.	DESCRIPTION	Financial Data for Last 5 Audited Financial Years				
		Year 2006-07	Year 2007-08	Year 2008-09	Year 2009-10	Year 2010-11
1	2	3	4	5	6	7
	Total value of <i>construction work</i> done as per audited financial statements					

NOTE:

1. Separate Performa shall be used for each member in case of JV/Consortium.
2. Attach attested copies of the Audited Financial Statements of the last five financial years as Annexure.
3. All such documents reflect the financial data of the tenderer or member in case of JV/Consortium, and not that of sister or parent company.
4. The financial data in above prescribed format shall be certified by Chartered Accountant / Company Auditor under his signature & stamp.
5. The above financial data will be updated to 31.05.2011 price level assuming 5% inflation for Indian Rupees every year and 2% for foreign currency portions per year.

ANNEXURE- 3BFINANCIAL DATA

(EXISTING COMMITMENTS FOR ON-GOING CONSTRUCTION WORKS)

NAME OF THE TENDERER (CONSTITUENT
MEMBER IN CASE OF JV/CONSORTIUM) :

(All amounts in Rupees in Crores)

Name and brief particulars of contracts for ongoing construction works	Contract Value	Value of balance work yet to be done (as on 31.05.2011)	Estimated Completion Date	Value of existing commitments for on-going construction works during period 2 years w.e.f. 31.05.2011 to 30-05-2013.	
				2011-12	2012-13
1	2	3	4	5	6
TOTAL (FOR ALL ONGOING WORKS)					

NOTE:

1. Separate Performa shall be used for each member in case of JV/Consortium.
2. Tenderer or member in case of JV/Consortium should provide information on their current commitments for all contracts that have been awarded or for which a letter of intent or acceptance has been received or for contracts approaching completion but for which a completion certificate is yet to be issued even if completion of such works spills over beyond completion period of this contract.

The financial data in above prescribed format shall be certified by Chartered Accountant / Company Auditor under his signature & stamp.

ANNEXURE- 4

UNDERTAKING FOR NOT BLACKLISTED

We do hereby undertake that we have not been blacklisted or deregistered by any central / state government department or public sector undertaking and also that none of our work was rescinded by the client after award of contract during last 10 years.

STAMP & SIGNATURE OF AUTHORIZED SIGNATORY

NOTE:

1. In case of JV/Consortium, the undertaking shall be submitted by each member of the JV/Consortium.
2. The undertaking shall be signed by authorized signatory of the tenderer or constituent member in case of JV/Consortium.

ANNEXURE- 5

UNDERTAKING FOR CORRUPT & FRAUDULANT PRACTICE

It is confirmed and declared that we, or any of our associate, have not been engaged in any fraudulent and corrupt practice as defined in Clause 5.0 of the General Conditions of Contract and that no agent, middleman or any intermediary has been, or will be, engaged to provide any services, or any other items of work related to the award and performance of this contract

STAMP & SIGNATURE OF AUTHORIZED SIGNATORY

NOTE:

1. In case of JV/Consortium, the undertaking shall be submitted by each member of the JV/Consortium.
2. The undertaking shall be signed by authorized signatory of the tenderer or constituent member in case of JV/Consortium.

SCOPE OF WORK

2.0 GENERAL

Contract CC-03- Design & Construction Of Civil Engineering works for Construction Of Bridge Across River Yamuna on Mukandpur- Yamuna Vihar Corridor for Phase III Of Delhi MRTS Project.

2.1 WORK CONTENT

2.1.1 Brief Scope

Design & Construction of Civil Engineering works of Bridge having fifteen spans (6X42.1 + 7X42.6 + 2 Approach Spans of 26m) across river Yamuna along with river training works for Mukundpur-Yamuna Vihar metro line of Phase III of Delhi MRTS project. The Bridge is to be constructed about 83 meters down stream of the existing Nizammudin Road Bridge. The scope of work consists of Design and Construction of well foundations, sub- structures and super structure with parapets on both sides with arrangements for fixing of OHE masts and signal poles, providing shear connectors for track bed casting etc.

- (a) Tenderers shall also submit all the detailed calculations & drawings in a soft-copy as well as hard copy
- (b) The Tenderers shall furnish all structural analysis and software used for this project.

Detail scope of work covered under Lump Sum cost (Schedule – A)

Following items are covered in lump sum cost quoted in Schedule A:

- (a) Conducting detailed subsurface exploration and taking at least one number bore hole at every foundation location, including analysis, interpretation and reporting of results thereof in accordance with IRC 78 (Standard Specifications and Code of practice of Road Bridges – Section VI Foundations The and Substructure) required for preparations of design of foundations. The depth of bore holes shall be upto at least 1.5 times the diameter/width of foundation below the proposed founding level;
- (b) Preparation detailed design, general drawings specifications and working drawings for various components of the works and obtaining approval in respect thereof from the Engineer ,inclusive of incorporation of all modifications, alterations ,changes ,etc. that may be required to be carried as directed;
- (c) Site clearance and dismantling of obstructions etc. before commencement of work all as specified or as directed;
- (d) True and proper setting out and layout of the work, bench marks and provision of all necessary labour ,instruments and appliance in connection therewith all as specified or as directed;
- (e) Provision of suitably designed well foundations/piles foundations for piers up to the minimum founding depths in accordance with the actual soil parameters as obtained from detailed sub surface exploration all as specified or as directed;
- (f) Provision of suitably designed piers, as specified or as directed; each pier shall have metallic strips with gauge marks to indicate flood level ;

- (g) Provision of Pier Cap of suitable size along with steel ladder to facilitate inspection of all bearings;
- (h) Provision of suitably designed bearings (POT PTFE) including testing, as specified or directed;
- (i) Provision of suitably designed pre-stressed cement concrete superstructure for the complete length of the bridge, as specified or as directed. This would include provision of shear connectors in the deck as per tender drawing to suit installation of Ballast less track, later by Track work contractor;
- (j) Providing suitably designed parapets with walk way on both side of deck, provision for cable ducts with covers, railing, earthing and bonding as per drawing, expansion joints, drainages spouts /down take pipes, inspection ladder along with suitably located manholes, providing holding down bolts as per drawing no. for fixing OHE traction masts on sides over the footpaths /walkway etc. at the location and spacing as required by traction contractor. All steel work like ladders-railing etc. shall be of galvanized steel;
- (k) Conducting one initial load test of pile as per IS- 2911- part IV;
- (l) Suitable provision for inspection of expansion joints and inside of box girder to inspect various parts of the girders at a later date after completion of the bridge;
- (m) All aspects of quality assurance, including testing of bearing and other components of the work, as specified or as directed;
- (n) Load testing of one longest span super structure as per IRC-SP-37;
- (o) Clearing of site and handing over of all the works ,as specified or as directed;
- (p) Maintenance of the complete work during the period as directed ;
- (q) Submission of the completion (i.e. 'as-built') drawings and other related documents as specified ;and
- (r) Any other item of work as may be required to be carried out for completing the bridge in all respect in accordance with the provision of the Contract and/or to ensure the structural stability and safety of the bridge during and after Construction.
- (s) Pile foundation with hydraulic rotary piling rigs for abutments. Pile cap including leveling course. Pier and pier cap as per the standard shape and finish.
- (t) Precast Prestressed single cell box girder in super structure by segmental construction using launching girders
- (u) Strengthening of box girders at OHE mast locations.
- (v) Precast parapets and railing. Precast cable ducts & covers. The top of duct cover should have proper neat cement finish. Expansion joint, sealant in the expansion joints of ramp walls. Man holes with manhole covers.
- (w) Drainage system (only GI Pipes of sufficient dia of medium class is to be provided for drainage purpose) at all locations, water collecting boxes at the pier location & its openable cover made up of mesh/jali;
- (x) All aspects of quality assurance, including testing of materials and other components of the work, as specified or as directed;

There is possibility of some of the items not getting mentioned in the above list of works. Tenderers are requested to go through the tender drawings also in details as the works mentioned above as well as indicated in the tender drawings would be considered inclusive in the scope of work. Employer decision shall be final in this regard in case of dispute.

Scope under Schedule B

This schedule is based on actual quantity of various item executed for work not covered in lump sum (schedule- A)

All river training works as per the CWPRS report which will be given later.

The cross section of guide bund shown in tender drawing is tentative and may change as per CWPRS report. The quantities in BOQ are tentative and may change as per requirement.

Scope under Schedule - C

All unforeseen works which are not covered in lump sum (Schedule A) and Schedule B will be paid under this head based on DSR-2007.

2.1.2 Bridge sub-structure

The bridge piers have to be such that these do not obstruct the water way of the existing Nizamuddin Bridge upstream of proposed MRTS Project.

2.2 Design Criteria

Design criteria shall be as per Design Basis Report enclosed in Vol. 1

The designed methodology for foundation design shall be as per guidelines and provisions given in the Design Basis Report of Contract.

The design should cover all the items such as "Foundation", "Sub-structure, Super Structure with the provision for Ballast less track", "Protection works", etc. The hydraulic data based on model studies conducted by CWPRS is as follows:-

HFL	=205.68
Design Discharge	=9,911 Cumecs
Check flood for foundation level/ Protection works	=12743 Cumecs
Scour level around well	=177.6m

Conceptual drawings furnished with the tender Documents show the founding level of works based on available soil investigation data. These may change at the time of actual execution of work based on further bore hole data.

2.2.1 The dimensions shown in tender drawing are mandatory to be followed..

2.2.2 The tender concept is schematic and the Tenderer is free to propose his own scheme and quote based on his design keeping following parameters unchanged:

- Design Criteria
- Codal requirements
- Loading requirements
- Foundation is to be well foundation of outer diameter not less than 8.0m for main bridge and well cap top is mandatory to be kept below the bed level.
- Span Configuration

- Free Board and Rail levels (Free board as per Codal to be kept.)
- Super structure to be pre cast, Pre-stressed, box type structure with internal pre stressing system for bridge main and cast in situ pre-stressed voided slab for approach spans.

2.2.3 Design Codes

- a) The design codes shall be the latest/modified codes.
- b) Indian Railway Bridges Rules for Broad Gauge except as modified above.
- c) IRS Bridge Substructure and Foundation Codes.
- d) IRC 78, Section VI, Code of Practice for Foundation And Structure for Bridges.
- e) IRS Concrete Bridge Code.
- f) IS 18-1980-Code of Practice for Pre-stressed Concrete.
- g) IRC-18-1985-Design Criteria for PSC Road Bridges (Post-tensioned Concrete).
- h) In addition to the above, the following codes shall also be followed as necessary-
 - i) IS 456 Code of Practice for Plain And Reinforced Concrete,
 - ii) IS 1893 Criteria for Earthquake Resistant Design of Structures
 - iii) IS 875 Code of practice for Use of Structural Safety of Building and Loading standards.
 - iv) IS 800 Code of Practice for Use of Structural Steel in General Building Construction
 - v) UIC-772/R: IRC-83(part-II) Specifications for Bearings
Section-IX, BS 5400
 - vi) IRC 83 (Part-II) Standard Specifications & Code of Practice for Road Bridges
Section IX Bearings
 - vii) IS-4138 Safety Code for Working in Compressed Air
 - viii) IRC-78 Well Foundation
 - ix) IS-8408 River Protection Works
 - x) IS-2911 (Parts I & IV) Pile Foundations
 - xi) IRC-SP-33 Design, Detailing and Durability
 - xii) DIN-1084 Part-I Concrete Permeability Test (Refer Annex 2.2)
 - xiii) IRC-5Section I Loads and Stresses
 - xiv) IRC- 21 Section III Cement Concrete Road Bridges
- b) Other relevant IRS/IRC/IS/BS/Din Codes.
- c) Guide lines for Design of Bridges and Elevated Structures vide: Annexure 2.2

2.2.4 Reference to the Standard Codes of Practice

2.2.4.1 All Standards, Technical Specification and Codes of Practice referred to shall be latest edition 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.

2.2.4.2 Wherever Indian Standards do not cover some particulars aspects of Design/Construction, relevant British German Standards will be referred too. The contractor shall make available at site such standards codes of practice.

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

- i) Provision in NIT
- ii) Technical Specification
- iii) Standard Code of Practice

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

2.2.5 Dimensions

2.2.5.1 As regards errors, omissions and discrepancies in Specifications and Drawings, Clause 26.0 of Special Condition of contract will apply.

2.2.5.2 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.

2.2.6 Loading Tests

2.2.6.1 The Engineer shall during the progress of the Works or the period of maintenance, instruct the Contractor that a loading test, on destructive tests such as UPV, Cover meter, rebound hammer etc. be made on the Works or any part thereof if, in his opinion, such a test or tests be deemed necessary for one or more of the reason herein below specified.

- a) The site made concrete test cubes failing to attain the specified strength;
- b) The shuttering for concrete works being prematurely removed;
- c) Overloading during construction of the Works or part thereof;
- d) Concrete improperly cured;
- e) If any portion of the work so identify is carried out without prior approval in writing of the Engineer or his representative or proceed with such work;
- f) Any other circumstances attributed to alleged negligence on the part of the Contractor which ,in the opinion of the Engineer result in the works or any part thereof being of less than the expected strength;
- g) Any reason other than the foregoing when there is fear of safety being jeopardized.

2.2.6.2 If the tests be instructed to be made for any of reason 2.1.6.1 'a to g' to the tests shall be made at the contractors on cost whether the result of such tests are found satisfactory or otherwise. If the tests be instructed to be made for any other reason than hereinbefore specified, the contractor shall made the tests and shall be reimbursed costs relating thereto only if the result is satisfactory.

2.2.6.3 All the loading tests or other specified tests will be carried out strictly in accordance with the instructions of the Engineer. Load testing will generally follow the procedure set out in Indian Railways Standard Code of Practice /IRC Codes, as applicable. The Engineer

will however, have the powers to prescribe any other modern recognized method of load testing.

- 2.2.6.4 If, in the opinion of the Engineer, the result of the loading tests or other tests is not satisfactory, the Engineer shall instruct that such parts of the Works as he specifies shall be taken down or cut out and reconstructed to comply with the specifications of, or other remedial measure be taken to make Works secure to the satisfaction of the Engineer. The contractor shall take down, or cut out and reconstruct the defective work or shall taken the remedial measure as defective work or shall take the remedial measure as instructed by the Engineer at his own cost . The contractor shall indemnify the Engineer against any an all obligations of payments in the rejected items.

2.3 Construction Depot

For casting yard, batching plant and other activities a plot of land of 10,000 Sqm will be made available free of cost by DMRC on as is where is basis at Yamuna bank. This land shall be made good for such offsite activities as needed by the Contractor at no extra cost to the employer. A mechanical tyre washing plant shall have to be installed by the contractor for the vehicles leaving the depot to avoid the spillage on the connecting roads. The land shall be cleared from debris all structure made by contractor including, RCC footing and raft etc. before handing over it back to the Employer and final bill shall be released to the contractor after all structures from the construction depot are removed.

- 2.3.1 The Tenderer shall provide casting yard which will include:

Site office including Laboratory for testing facilities & Quality Controls-

- a) Control testing is the testing of materials prior to their delivery from a manufacturer, or during construction and such others tests as are specified to ensure compliance with the quality of work envisaged in the contract document. The Contractor shall assume full responsibility for control testing and give sufficient notice to the Engineer to enable him to witness the tests. Control testing shall be at witness the tests. Control testing shall be at the expense of Contractor.
- b) The Contractor shall set up at his own cost in the casting yard, a fully equipped concrete testing laboratory and equipments for concrete mix design, cube testing , ,setting time of cement ,finesse of cement ,mortar cube testing, permeability of concrete (as per DIN Code),silt content in fine aggregate ,pH value of water, sieve analysis, hardness index of aggregate ,aggregate crushing strength ,aggregate impact value etc. Equipment and personnel in the testing laboratories shall be suitably qualified to perform the services required in connection with the quality control envisaged in Technical Specifications and Quality Assurance Programme. The cost of equipment, consumables, manpower, and accommodation shall be borne by the Contractor without any extra cost to the employer. Contractor shall obtain prior approval of the Engineer for the setup of testing laboratory.
- c) Concrete samples ,special cement, aggregate samples shall be tested in this laboratory as and when required at no extra cost, in the presence of Employer's representatives at such frequent intervals and on such specimen of work as stipulated by the Engineer. The results of such tests should be made available to the Engineer as and when done. The tenderer /

contractor should also make available free of charge the facilities available at his testing laboratories to the Employer for any other testing, which the Employer may like to do on their own. Such a testing centre should be manned by competent and trained man at contractor's cost.

- d) Test cubes required as per the code shall be manufactured and supplied free of cost by the contractor and he shall submit a mix design for verification and approval before the work is taken up.
- e) The water used for concreting shall also be tested to ensure that it is suitable for concreting work and required test certificate should be produced.
- f) The Engineer may required any other test to performed at any time, as he considered necessary for the control of quality of materials and workmanship including, if need arises, core cutting , ultrasonic, rebound hammer tests etc. These shall be undertaken by the contractor at his own cost.
- g) For tests which are required to undertaken in the manufacturing shops (such as neoprene bearings/ pot bearings etc.) services of in-house laboratory/ testing establishment of the manufacturer shall be availed of. Other's specialized tests can be undertaken by the contractor at his own cost. The Engineer shall be afforded full access to such testing facilities and to witness such tests.
- ii) Batching plant with arrangements for cement storage, aggregate storage etc. should be under a covered shed.
- iii) Covered shed for storage of cement, prestressing steel etc.-
 - a) Open yard for cutting and bending of reinforcing steel.
 - b) Covered workshop for fabrication of form work.
 - c) Covered shed for casting and open or covered yard for stacking of precast concrete girders and other items if any.

2.3.1.1 Land area identified for setting up of casting yard has been shown in conceptual plan.

2.3.1.2 Earth work or any other type of work required to make the area suitable for proper functioning of casting yard shall be done by contractor.

2.3.2 Foundation

Layout/ conceptual drawings for the main bridge provide for well foundation of 8 m diameter well, founded generally to a depth of 42.4m below design HFL of 205.68m. Each well will support a pier for the provision of two tracks. Wells and sub and super structures shall be suitably designed and detailed.

In order to expedite the work advance methods like Jack down method should be used for sinking well; this will also help in controlling tilt and shift of wells.

Layout / conceptual drawings for the approach viaduct provide for bored pile foundations to varying depths to suit the soil condition and the super imposed loads. Each pile cluster will have a common pile cap supporting a column of the portal or abutment or wing wall. The

contractor is expected to carry out soil boring and analysis as required in IRC-78 at his own cost so as to decide on the founding level. In case rock is met with at founding level, it should be taken into the rock for at least one meter. Temporary liners will have to be provide during drilling through soil where "N" value of the soil is less then or equal to 15. Permanent liner will have to be provided at locations where bad soils and/ or bed sub soil water conditions are met with. The thickness of liners shall be 8mm for the bottom 2m of the length subject to a minimum of 2m and 6mm for height above.

2.3.3 Bearings

The bearings shall be of Pot cum PTFE type. The bearings shall be fixed over suitable pedestals on pier so as to facilitate ease of inspection and maintenance.

2.3.4 Protection Works/Guide Bund

All protection works are required to be completed in one working season from October 2011 to May 2012.

The guide bunds are presently under detailed design. Details & drawings for the same shall be provided by DMRC at the execution stage. The scope of work shall also include all protection work required for bridge as given below:

- a) Construction of guide bund as per layout/conceptual drawings including earthwork with mole head etc. and provision of a service road.

2.3.4.1 Sub and Super Structure

a) Main Bridge – Substructure:

- a. The longitudinal section shown in conceptual drawings indicates the likely levels upto which well foundation will have to be taken. However, during execution stage, the Contractor has to carry out soil boring and analysis at each proposed pier location to depths as required in IRC-78 at his own cost so as to decide on founding level. In case the foundation has to be taken deeper or stopped at a level higher than what is shown in the drawing, price adjustment will be done for the difference in levels as described in Clause 3.1.3.

- b. Wells shall have outer diameter not less than 8.0 m.

b) Approach viaduct – Substructure

The arrangement of the span on eastern side approach spans is indicated in Drawing No. DMRC/PH-III/MP-YV/GAD/2011.

Please note that the contractor has to make appropriate temporary structure arrangements for Casting & Launching the pre-cast box girders.

c) Main Bridge and Approach viaduct – Superstructure

- i. The cross section of super structure is shown in conceptual drawings. The girders for the main bridge are to be pre-cast, launched and erected. If the Tenderer chooses

any alternative form, he should ensure that the minimum clearance as indicated in conceptual drawings or as required as per IRS Codes, is provided.

- ii. The girder for the approach viaduct will have to be also specially designed in accommodates two main line tracks and turnout/delivery track. The arrangement can be with Box Girders as shown in conceptual plan suitably connected or as multi cellular Box Girder with suitable bearing arrangements.
- iii. The girders will have cross diaphragms at each end with provision for jacking up when necessary for changing of bearings etc. The deck width and profile shall be adopted as shown in conceptual drawings in all cases. The OHE structures themselves are excluded from the scope of the tender, but civil works required for fixing the structures is included, and shall be done in coordination with the OHE contractor/Engineer. The necessary arrangements shall form part of the total work. The deck floor shall be finished rough to provide adequate bond to the concrete to be poured later for housing the ballast less track. In case of ballasted track, the deck shall be finished smooth with a suitable water proof wearing course preferably mastic asphalt 25 mm thick minimum and cross slope and longitudinal grading as directed by the Engineer.
- iv. The Contractor shall himself formulate a practical and viable scheme for design/fabrication of shuttering, casing curing, testing and launching/erection of Girders. The shuttering for all works should be firm and sturdy. It shall be fixed and maintained so as to limit the deflection or deviation between supports to 1.50 mm construction joints during casting should be avoided by concreting adopting forward flowing method. Where unavoidable, it should be at locations as directed by the Engineer. At such locations to avoid cold joint suitable surface retarder shall be used. Needle vibrators should be used in addition to Form vibrators for better compaction concreting sequence shall be as approved by the Engineer and adequate standby equipment arranged to ensure continuity of concreting. The detailing of layout of bars laps, bends, distribution bars and spacers as well as layout and disposition of pre-stressing tendon should be such that the placement of concrete is easy and vibration of concrete between the elements with easy passage of needle vibrators is possible. None of these elements should be disturbed during such vibrations.
- v. Cover blocks used shall be of same concrete mix design and should be cast on vibrating table. The surface to be in contact with the surrounding concrete should have exposed aggregates. Ring type cover blocks should be used, unless otherwise permitted by Engineer.
- vi. Design of super and substructures should take into account provision of long welded rails on ballast less track. Forces that will be met with in service and during emergencies such as breakage of rail joint and/or possible settlements of foundation or damage to any pier due to collision in case of an accident should be taken into account in design of structures and bearings.

2.4 Associated Works

- 2.4.1** Works to be performed shall also include all general works preparatory to the construction of Rail Bridge across river Yamuna with its east end approach viaduct 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 the best Engineering standards and orders that may be issued by the Engineer in Charge from time to time, compliance by the agency with all Conditions of Contract, supply of all material, apparatus, plants, equipments, tools, fuel, strutting, timbering, transport, offices, stores, workshops, staff, and the provision of proper and sufficient protective works, diversions, 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.

2.5 Layout/Conceptual Drawings

Layout/Conceptual Drawing as represent Employer's proposal based on preliminary design. The contractor shall examine and prepare detailed designs, drawings and working drawings for the Employer's scheme or his own alternative scheme. Sub-clause 3.1.1 (b) may be referred to in this connection.

2.6 TIME SCHEDULE

- 2.6.1** The agency shall submit with the tender "Time Schedule" for completion of various portions of works. This schedule is to be within the overall completion period of 24 months. The detailed programme in the form of a quantified bar chart or CPM network shall include all activities starting from design to completion.

2.7 INTERFACES WORKS

In addition the contractor shall be required to carry out various miscellaneous works as per interfacing requirements.

The scope of work for interfacing works for contractor e. g. Signaling and Telecommunication, traction Power & Power Distribution, Track work, Rolling Stock etc.

TENDER PRICES

3.1 TENDER PRICES

3.1.1 **a.** Unless explicitly stated otherwise in the Tender Document, the contract shall be for the whole works, based on the Bill of Quantities and Payment shall as per accepted rates of Contract.

b. The design notes, calculations, specifications, dimensioned drawings and unit priced bill of Quantities prepared by the tenderer in respect of his technically acceptable proposal shall be for limited purpose of tender evaluation and for enabling its technical acceptability, price and construction time to be prima facie assessed.

c. Irrespective of the estimated Quantities and /or dimensioned detailed for various items of work as furnished in the design notes, calculations, specifications, unit priced bill of Quantities or outline/dimensioned drawings accompanying the tenderer for the work, the successful tenderer shall carry out all changes, modifications or alterations that may during the scrutiny of the detailed designs and working drawing or during construction be considered necessary in the opinion of the engineer for compliance with.

d. All duties, taxes, fees, octray and other levies, payable by the contractor under the contract shall be included in the total contract price submitted by the tenderer, but exemptions in the taxes and duties available to DMRC as mentioned in the clause 10.6 of Instructions to Tenderer (ITT) should be properly assessed and excluded from the tender price, as the same will be available to the contractor on the basis of the Exemption-Certificate issued by DMRC on the request of the contractor as mentioned in Clause 10.6 of Instruction to Tenderer (ITT).

The evaluation of the Tender by the Employer shall be made on the basis of Quoted rates only.

e. The Contract Price quoted by the Tenderer is subject to adjustment during the performance of Contract in accordance with the provisions of Clause 11.0 and 12.0 of the General Conditions of Contract.

f. It is a fundamental condition of this contract that the subject works shall be constructed and completed in accordance with the provisions of a Lump Sum Price Contract. The requirement to submit design notes, calculations, outline/ dimensioned drawings, unit priced bill of quantities etc. as part of the Tenderers offer for the work, is expressly understood by both parties to the contract as being intended for the limited purpose of assessing broadly its technical acceptability, price, construction time, etc. on the prima facie only and that furthermore, the same shall not form the basis of any subsequent claim or demand for variation in the contract prices named in the Letter of Acceptance.

3.1.2 The payment to the Contractor will also include the following. The prices and measurement referred to will be base on the Design and Drawings finally approved by the Employer (whether Employer's proposal or Tenderer's proposal) and reflected in the schedule-'A', 'B' and 'C' of Price Bill of Quantities.

- i) Lump Sum price quoted by the tenderer for Schedule-'A'.
- ii) Price quoted in Schedule-'B' and Schedule-'C'
- iii) Other items if specially mentioned in the priced Bill of Quantities.

iv) Price variation in terms of Clause 18.1 of SCC.

3.1.3 The Lump Sum amount quoted in Schedule-'A' should include the cost of Well Foundation with founding level as shown in the conceptual drawings.

'Price Adjustment' for any change in the founding level will be done on the pro-rata basis of the amount as per percentage payment for the item of 'Steining and Sinking'[item 3(2)] shown in Annexure-1 of schedule-'A' of BOQ. The method of calculation of Price-adjustment is illustrated as under:-

a) Suppose lump-sum amount quoted = Rs. M

b) Amount as per stage payment for 1 well @ 3.428% = Rs. $(3.428/100)*M$

c) Amount for steining and Sinking for 1 well @ 82% of $(3.428/100)*M =$

$$\text{Rs. } [(82/100)*3.428/100]*M = \text{Rs. } 0.02811 M$$

d) Actual depth of the well measured from the soffit of well cap = 'H' meter

e) Depth of the well measured form the soffit of well cap as per conceptual drawings = 'h' meter.

f) Then, Price adjustment for depth for the well = $\text{Rs.}(H-h)*(0.02811/h)*M$

g) (-)ve (negative) Price adjustment means, the amount is to be reimbursed to the Employer from the Lump-Sum amount quoted by the contractor in Schedule – 'A' of BOQ

3.2 On account payment of Schedule-'A' will be made as per Annexure-1 and against Schedule-'B' and Schedule-'C' as per actual work done at site.

SITE INFORMATION

4.1 Work Site

- 4.1.1 The project site is located in the National Capital Territory of Delhi. The location of the work and the general site particulars are shown in the General Arrangements Drawings enclosed in the tender documents.
- 4.1.2 The proposed Work falls on Mukundpur- Yamuna Vihar Corridor for of Delhi Metro Rail Project.
- 4.1.3 The Contractor shall plan his works keeping in view restriction of approach and availability of space and time.

4.2 GENERAL CLIMATIC CONDITIONS

- 4.2.1 The area in which the work lies is mostly plain terrain falling within latitudes 28°-20' and 28°-45' North and longitudes 76°-56' and 77°-20' East.
- 4.2.2 The recorded highest and lowest temperatures in the past 10 years are 45.8 degree Celsius and 2.4 degree Celsius respectively.
- 4.2.3 Summer season is from April to June and winter season is from November to March.
- 4.2.4 Mean average annual rainfall in the area over a five-year period is of the order of 735 mm, a good portion of which is concentrated during July to mid September, when about 75% of the annual rainfall occurs. The heaviest rainfall recorded during 24-hour period is 191 mm.

4.3 SEISMIC ZONE

Delhi falls in Seismic Zone IV. Earthquake of maximum magnitude VIII on Modified Mercalli scale has been experienced in the past, in the region.