JAIPUR METRO RAIL CORPORATION LIMITED

Bidding Document: ICB No: Contract JP/EW/1C&1D(Elevated)/02

Contract ICB No: JP/EW/1C&1D(Elevated)/02: Design and Construction of Elevated Ramp, Elevated Viaduct and One Elevated Station (Transport Nagar) from start of elevated ramp (CH:13040.00 m) to Transport Nagar Dead end (CH:13996.00 m) of Jaipur Metro Phase-1C and Design and Construction of Elevated Viaduct and One Elevated Station (Ajmer Road Chauraha including loop line) from Mansarovar dead end (CH:-1243.930 m)(excluding) to Ajmer Road Chauraha dead end (CH:-2595.90 m) of Jaipur Metro Phase-1D, including Entry Exit Structures, Architectural finishing, water supply, Sanitary Installations, Drainage Works, Pre-Engineered Sheet Roof Structure and Roof Sheeting Works for Jaipur Metro Phase-1C and Phase-1D at Jaipur, Rajasthan, India.

ADDENDUM/ CORRIGENDUM No.02

Summary Sheet

SN	Bidding Document	Page No	Clause No/Item No	Addendum/ Corrigendum	Remarks
1.	Volume-1 of 7:-Notice Inviting Bid (NIB)	05R1	Clause-1.1.2 Key Details	Last Date of Bid Submission and Opening is revised as **09.08.2023** (18:00 Hrs) and **10.08.2023** (15:30 Hrs) respectively.	Replace Page 05R1 with 05 R2.
2.	Volume-2 of 7: Part 1 General Conditions of Contract (GCC)	44 & 53	Clause-10.10; 12.1 (2,4(i) and 4(i)(c)	Clause-10.10; 12.1 (2,4(i) and 4(i)(c) are modified.	Replace Page 44 & 53 with 44R1 & 53R1
3.	Volume- 4 of 7: Outline Construction Specifications (OCS) Part-4	96R1	Clause-6.4.8 Anchorages	Clause-6.4.8 Is modified.	Replace Page 96R1 with 96R2
	Part-4	150 R1	Clause-8.1.6 Pile Cap	Clause-8.1.6 Is modified.	Replace Page 150R1 with 150R2
	Part-4	151R1	Clause-8.1.7 (iii)	Clause-8.1.7 (iii) is modified.	Replace Page 151R1 with 151R2
	Part-5	179R1	Clause-9.1.3 (a)	Clause-9.1.3 (a) is modified.	Replace Page 179R1 with 179 R2
4.	Volume- 4 of 7: Outline Design Specifications (Part-1)	17	Clause 6.7.5 Computation of Fundamental period of vibration	Clause- 6.7.5 Computation of Fundamental period of vibration is modified.	Replace Page 17 with 17 R1

Jaipur Metro Rail Corporation Director (Project) JAIPUR

SN	Bidding Document	Page No	Clause No/Item No	Addendum/ Corrigendum	Remarks
5.	Volume- 4 of 7: Outline Design Specifications (Part-2)	81A to 90	Clause-7. Annexure-A: Load Combination	Clause-7. Annexure-A: Load Combination is modified.	Replace Pages 81A to 90 with 81AR1 to 90R1
6.	Reply to bidder's queries received up to 07.07.2023 (issued through Addendum Corrigendum No-01)	Total Pages 14 Nos.		Page No 2 and 4 are modified.	Replace Page No 2 and 4 with 2R1 and 4R1

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Jaipur Metro Rail Corporation Director (Project) JAIPUR

	day before the meeting (latest by 1100 hrs on **06.07.2023**) to the registered official email of JMRC i.e. **jmrc.phase1cand1d.elevated@jaipurmetrorail.in** so that link having details such as software, meeting ID, password etc. can be mailed to these persons at least 12 hours before the scheduled pre- bid meeting.
Last date of issuing addendum (if any)	**17.07.2023**
Date & time of Submission of Bid online	Bid submission start date: **18.07.2023**(09:00 hrs). Bid submission end date: **09.08.2023** (18:00 hrs).
Date & time of opening of Bid online	**10.08.2023** at 15:30 hrs.
Authority for purchase of Bid documents (in case of physical Bids), seeking clarifications and submission of completed Bid documents	**Director Project,** Jaipur Metro Rail Corporation Ltd., 1st Floor, A-Wing, Admin Building, Bhrigu Path, Mansarovar Metro Depot, Mansarovar, Jaipur-302020. **Contact; +91-141-2822781 / 2822786.** **E-Mail id: - jmrc.phase1cand1d.elevated@jaipurmetrorail.in ;**

To facilitate payment of Tender Fee, E-Bidding Processing Fee and Bid Security through RTGS, NEFT & IMPS, the details of bank account of JMRC is mentioned below

Name of Bank	Bank's Address	Account Name & No.	Account Type	IFSC code
ICICI Bank. Branch:-Tilak Marg,C-Scheme, Jaipur.	Khanij Bhawan, Tilak Marg, C-Scheme, Jaipur-302005, Rajasthan	Jaipur Metro Rail Corporation A/C:678605111973	Current	ICIC0006786

1.1.3 **QUALIFICATION CRITERIA:**

1.1.3.1 **Eligible Applicants:**

i. The Bids for this work will be considered only from those Bidders (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 NIB. 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. Also, each member shall be individually responsible for its duties as specified in the MOU/JV agreement submitted by the bidder in terms of clause 1.1.3.1 vii d.

Performance of each JV/Consortium partner shall also be judged on quarterly basis. In case, the performance of the partner(s) is not found satisfactory, actions as deemed appropriate by the Employer may be taken including termination of contract or termination of any of JV/Consortium member(s) from the contract i.e Part Termination of the contract. In case of part termination of contract, the Performance Security(ies) submitted by the member(s) for their portion of work in contract as per their share in JV/Consortium shall be forfeited and the scope of the work/duties assigned to the defaulting JV/Consortium member(s) as per the MOU/agreement submitted, may be terminated, however, same may be done by the Employer only if other member(s) of JV/Consortium are ready to complete the entire scope of work. In such a case, remaining works pertaining to the scope of defaulting member of JV, may be completed by other member(s) of JV in the following manner:

Jaipur Metro Rail Corporation Director (Project) JAIPUR

Contractor reasonable notice of such date. If the Contractor fails to remedy the defect or damage by such date and the necessity for such Work is due to a cause stated in Sub-clause 10.2(a), (b) or (c), the Employer may (at his sole discretion):

a) carry out the Work himself or by others, in a reasonable manner and at the Contractor's risk and cost, but the Contractor shall have no responsibility for such Work: the costs incurred by the Employer in remedying the defect or damage shall be recoverable from the Contractor by the Employer;

b) require the Engineer to determine and certify a reasonable reduction in the Contract Price; or

c) if the defect or damage is such that the Employer has been deprived of substantially the whole of the benefit of the Works or parts of the Works, terminate the Contract in respect of such parts of the Works as cannot be put to the intended use, the Employer shall then be entitled to recover all sums paid for such parts of the Works together with the cost of dismantling the same, clearing the Site and returning Plant, Rolling Stock and Materials to the Contractor, and Sub-clause 13 shall not apply.

Notwithstanding anything contained herein the Employer would be entitled in urgent and critical situation(s)/events to remedy the defects in the Work by himself or through others, at the Contractor's risk and cost. The cost incurred by the Employer in remedying the defect or damage shall be recoverable from the Contractor by the Employer.

Removal of Defective Work **10.5** If the defect or damage is such that it cannot be remedied expeditiously on the Site and if the Employer gives consent, the Contractor may, remove from the Site for the purposes of repair any part of the Works, which is defective or damaged. This consent may require the Contractor to increase the amount of Performance Security by the full replacement cost of these items or to provide other appropriate Security acceptable to the Employer.

Further Tests **10.6** If the remedying of any defect or damage is such that it may affect the performance of the Works, the Engineer may require that Tests on Completion, including Integrated Testing, be repeated to the extent necessary. The requirement shall be made by notice within 28 days after the defect or damage is remedied. Such Tests shall be carried out in accordance with Clause 7.11

Right of Access **10.7** Until the Performance Certificate has been issued, the Contractor shall have the right of access to all parts of the Works and to records of the working and performance of the Works, except as may be inconsistent with any reasonable security restrictions by the organisation responsible for operating the Works.

Contractor to Search **10.8** The Contractor shall, if required by the Engineer, search for the cause of any defect, under the direction of the Engineer. Unless the defect is one for which the Contractor is liable, the Cost of such search shall be added to the Contract Price.

Performance Certificate **10.9** The Contract shall not be considered to be completed until the Performance Certificate has been signed by the Engineer or authorized official of the Employer and delivered to the Contractor at the end of 'Defect Liability Period, stating the date on which the Contractor completed his obligations related to completion of works and rectification of defects during Defect Liability Period to the Engineer's satisfaction. Only the Performance Certificate shall be deemed to constitute approval of the Works.

Notwithstanding anything contained herein the Contractor would continue to remain liable to the Employer for any cost, loss, damage or compensation which arises from hidden or latent defect in the work executed by the Contractor under the Contract, even if such hidden and latent defects arise after the expiry of Defect Liability period or grant of Performance Certificate by the Employer under the Contract to the Contractor.

Jaipur Metro Rail Corporation Director (Project) JAIPUR

Unfulfilled Obligations **10.10** After the Performance Certificate has been issued, the Contractor and the Employer shall remain liable for the fulfilment of any obligation, which remains unperformed at that **time**. For the purposes of determining the nature and

procures less than the quantity specified in the bidding documents due to change in circumstances, the bidder shall not be entitled for any claim or compensation except otherwise provided in the bidding documents.
(2) Orders for extra items may be placed by the procuring entity in accordance with the Schedule of Powers of JMRC, up to 5% of the value of the original contract, if allowed in the bidding documents. The fair market value of such extra items payable by the procuring entity to the contractor shall be determined by the procuring entity in accordance with guidelines prescribed by the **administrative** deptt.
(3) Orders for additional quantities may be placed, if allowed in the bidding documents, on the rates and conditions given in the contract and the original order was given after inviting open competitive bids. Delivery or completion period may also be proportionately increased. The limits of orders for additional quantities shall be as under :-
(a) 50% of the quantity of the individual items and 50% of the value of original contract in case of works; and
(b) 50% of the value of goods or services of the original contract.
Provided that in exceptional circumstances and without changing the scope of work envisaged under the contract, a procuring entity may procure additional quantities beyond 50% of the quantity of the individual items as provided in the original work order with prior approval of the administrative deptt. as follows :-
(i) the procuring entity shall obtain prior approval for revised requirements from the competent authority for reasons to be recorded in writing. Wherever necessary, due to the quantum of orders for additional quantities, the procuring entity shall obtain prior and revised technical, financial and administrative sanctions from the competent authorities;
(ii) that the additional quantities so procured shall be part and parcel of the work being executed;
(iii) that the limit of 50% of the value of original contract shall not be exceeded in any case

(4) Deriving Rates For New Items / Negotiation :

This Sub-clause shall be applicable to all Schedules of BOQ including Lump-Sum Schedule.

(i) In case Engineer introduces an item for which the Contract does not contain any rates or prices applicable to the varied Works, the rate of such items shall be derived, wherever possible, from rate for similar items available in the Bill of Quantities of the accepted Tender. In case this is not possible, the rate may be decided on the following basis:

a) Cost of Materials at current market price, as actually utilized in the final finished Permanent Works, including a reasonable percentage for wastage and transportation.

b) Cost of enabling works if any (unless provided for separately) worked out on the above basis but with less stringent quality. Specifications minus salvage value of serviceable material released after completion of Work and cost of material released as scrap.

c) Cost of labour actually used at the site of Work at rates under Payment of Minimum Wages Act for the area of Work for each category of worker, further enhanced by a percentage of 10% of the aforesaid rates to account for labour not directly utilised at Site and other ancillary and incidental expenses on labour.
d) Hire charges for Plant & Machinery, scaffolding, shuttering, forms, etc., required to be used at the site of the work. The tools used by the various trades shall not be counted as Plant & Machinery for this purpose.
e) An amount of 20% of items **4**(i) a), b), c) and d) above to allow for Contractor's overheads including water/electricity charges and labour cess etc., profits and corporate taxes etc. No such percentage shall be applicable to the

Jaipur Metro Rail Corporation
Director (Project)
JAIPUR

6.4.5 Protection of Prestressing Steel

Prestressing steel shall be continuously protected against corrosion, until grouted. 'The corrosion protector shall have no deleterious effect on the steel or concrete or on the bond strength of steel to concrete. Grouting shall conform to these specifications or as directed by the Engineer.

6.4.6 Sheathing

The joints of all sheathings shall be water-tight. Special attention shall be paid to the junction at the anchorage end, where the sheathing must tightly fit on the protruding trumpet end of anchorage and thereafter sealed preferably with adhesive water proof tape as per approved manufacturer.

The sheathing and all joints shall be water tight. Any temporary opening in the sheathing shall be satisfactorily plugged and all joints between sheathing and any other part of the prestressing system shall be effectively sealed to prevent entry of mortar, dust, water or other deleterious matter. Sheathing shall be neatly fitted at joints without internal projection or reduction of diameter. Sheathing shall be firmly tied so that while concreting they should not float up. Sheathing shall be aligned accurately with respect to vertical and horizontal coordinate. Enlarged portions of the sheathing at couplings or anchorages shall be of sufficient length to provide for the extension of the tendons.

6.4.7 Grout Vents

Grout vents of at least 20 mm diameter shall be provided at both ends of the sheathing and at all valleys and crests along its length. Additional vents with plugs shall also be provided along the length of sheathing such that the spacing of consecutive vents does not exceed 20 m. Each of the grout vents shall be provided with a plug or similar device capable of withstanding a pressure of 1.0 MPa without the loss of water, air pressure or grout.

6.4.8 Anchorages

All bearing surfaces of the anchorages shall be cleaned prior to concreting and tensioning. Anchor cones, blocks and plates shall be securely positioned and maintained during concreting such that the centre line of the duct passes axially through the anchorage assembly. The anchorages shall be recessed from the concrete surface as per drawings.

After the prestressing operations are completed and prestressing strands are cut, the surface shall be painted with two coats of epoxy of suitable formulation having a dry film thickness of 80 microns per coat and entire recess shall be filled with concrete or non-shrink/pre-packaged mortar or epoxy concrete **within 7 days of grouting(in case of stressing and grouting are done in two or more stages, the recess filling should be done within 7 days of last stage grouting but in no case it shall be more than 14 days)**

6.4.9 Handling and Storage

Care shall be taken to avoid mechanically damaging, work-hardening or heating prestressing tendons while handling. All prestressing tendons shall be stored clear of the

Jaipur Metro Rail Corporation
Director (Project)
JAIPUR

8.1.5 Alignment of Piles:

i) Piles shall be installed as accurately as possible according to the drawings either vertically or to the specified batter. All deviations will be measured at the cut off level of the piles. The deviation from the true axis shall not be more than 1.5% for vertical piles and 4% for rake piles. Piles should not deviate in location by more than 75mm when used in groups. For single or 2 piles used under columns, deviation shall not be more than 50mm.

ii) The Contractor shall maintain a record of actual pile locations in the form of drawing and submit the information to the Engineer at suitable intervals.

8.1.6 Pile Cap:

Pile caps shall be of reinforced concrete. A minimum offset of 250 mm shall be provided beyond the outer faces of the outer most piles in the group. If the pile cap is in contact with earth at the bottom, a leveling course of minimum 75 mm thickness of PCC of grade M15 shall be provided or as shown in the drawings.

The attachment of the pile head to the cap shall be adequate for the transmission of loads and forces. A portion of pile top may be stripped of concrete and the reinforcement anchored into the cap. Manual chipping may be permitted after three days of pile casting while pneumatic tools for chipping shall not be used before seven days after pile casting. The top of pile after stripping shall project at least **50mm** into the pile cap. Concreting of the pile cap shall be carried out in dry conditions. All the operations and tools required for making the pile in dry condition is included in the item.

The road surface after casting of pile cap should be repaired immediately. If the surface is not repaired immediately, penalty will be imposed as decided by the Engineer.

8.1.7 Testing of Piles:

i) The load tests shall be in accordance with the Indian Standard Code of Practice for Design and Construction of Pile Foundations IS 2911 (Part IV) Load Tests on Piles. For initial load test, test load will be 2.5 times the theoretical designed capacity of pile. For initial load, test arrangement to be designed shall also cater for additional 25% above test load and nothing extra will be paid on this account. Permissible stresses in test arrangement (steel truss or plate girder) to cater for test load plus additional 25% load shall be within permissible stresses as per IS: 800 (as for permanent structure). For test frame, steel of Grade –B conforming to IS: 2062 shall be used.

ii) Engineer will decide the locations of initial and routine horizontal and vertical load test. One no. initial load test is to be performed in each km for each diameter of pile being used in viaduct. The contractor shall undertake test piles required for initial pile load test in the initial stages of work using the same methodology and equipment"s which will be subsequently used for working piles. These tests shall be undertaken well in advance of working pile. No working pile would be allowed to undertaken till initial satisfactory initial pile load tests have been completed.

Non-granting of permission for pile/ pile cap by Engineer in such respect will not be considered as reason for delay or any claim thereof. The test arrangement to be employed shall be of nature which is quick to install and remove and easily transferable. **At every one KM of viaduct initial load test both vertical and horizontal are to be performed by the contractor for each type of pile. Also one initial load test both vertical and horizontal per station are to be performed by the contractor for each type of pile.**

iii) Routine horizontal & vertical load tests are performed as a check on the load carrying capacity and settlements of the pile foundations. At least one routine test shall be performed for every 100 piles unless otherwise specified by the Engineer. **Initial and routine vertical and horizontal load test shall be conducted on different piles.**

iv) The Contractor shall give the Engineer at least 48 hours notice of the commencement of construction of these piles which are to be subjected to Initial Tests.

v) The load tests shall not normally be conducted unless the concrete is at least 28 days old. However in special circumstances, permission can be given by Engineer for prior testing.

vi) All testing shall be done under the direction of experienced personnel conversant with the equipment and the testing procedure.

vii) Before the commencement of the tests all the particulars regarding the test pile including boring data and concrete cube strengths shall be made available at site and shall form a part of the test report.

viii) On completion of each load test the Contractor shall submit a report of the load test which shall include the following information.

a) Description of soil conditions, ground water table, actual boring and installation records, concrete cube test results.

b) Method of load application

c) Load settlement readings during loading and unloading

d) Time load-settlement curve

e) All other observation relevant to the test being conducted.

ix) Integrity test

Two types of pile integrity tests will be performed:

Dynamic Integrity Test:

The Dynamic Integrity test using pile driving analyser or approved equivalent for pile integrity shall be performed on all the piles. The top of the pile shall be made accessible, chipped off up to hard concrete, levelled by trimming it back as far as practicable. The reinforcing bars of the piles tested shall be bent sideways. The test shall be performed after removal of bad/ weak concrete at top so that the wave propagation is steady through hard concrete. The test shall be carried out at minimum 3 locations on each pile in such a way that the entire cross section of the pile is evenly covered. The test shall be conducted with a minimum age of

Grades of raw elastomer of proven use in elastomeric bearings, with low crystallization Grades of raw elastomer of proven shelf life ~~**(e.g. Neoprene WRT, Bayprene 110 Skyprene B- and Denka S-40V)**~~ as indicated in latest revision of IRC-83, Part II) shall be used.

No reclaimed rubber or vulcanized wastes or natural rubber shall be used.

The raw elastomer content of the compound shall not be lower than 60 per cent by its weight. The ash content shall not exceed 5 percent (as per tests conducted in accordance with ASTM D-297, sub-section 10).

EPDM and other similar candidate elastomer for bridge bearing use shall not be permitted.

b) Properties

The elastomer shall conform to the properties specified in Clause 4.3.1 of the IRICEN publication titled "Bearings for Railway Bridges" and those specified in Table 2000-1 of the publication titled "Specifications for Road and Bridge Works", published by IRC on behalf of MORTH (Roads Wing).

c) Fabrication and Tolerances

Fabrication and Dimensional tolerances shall be governed by the specifications laid down in Clause 4.3.2 of the IRICEN publication & Clause 2005.3 of the MORTH specifications mentioned above.

d) Acceptance Specifications

For inspection and testing requirement Clause 4.4 of the above mentioned IRICEN publication shall be referred with modifications of lot size as mentioned below:-

Sampling testing and acceptance consideration will be made on a lot basis. A lot shall be defined as those bearings presented for inspection at a specific time or date. A lot shall be further defined as the smallest number of bearings as determined by the following criteria.

i. A lot shall not exceed a single contract or project quantity;

ii. A lot shall not exceed 50 bearings;

iii. A lot shall consist of those bearing of the same type regardless of load capacity.

Accepting and testing requirements shall also conform to the specifications laid down in Clause 2005.4 of the referred MORTH specifications.

In addition to tests mentioned above, all bearings shall be also weight actually and compared with the theoretical weight.

All bearings shall carry a warrantee of not less than 15 years in an approved format. The contractor shall be responsible for immediate repair or replacement of the bearings in case of failure / distress to the satisfaction of the owner at no extra cost to the Owner within the warrantee period.

Criteria for Selection of bearing manufacturer shall conform to requirement of Most letter No-RW/NH-34057(1) / 95-(S & R) dated 2nd November,2000. It is necessary that all manufacturers of all elastomeric bearings shall have in house facilities for carrying out Infrared Spectro-Photometry as per ASTM D-3677.

6.7.4 Response Reduction Factor

Response Reduction Factor "R" as per IRS Seismic code Table -3 shall be as given below

S.No.	Elements	Response Reduction Factor "R"
1	RCC Pier with ductile detailing	3.0
2	PSC Pier/Pier cap/Portal beam	2.0
3	Portal Pier with ductile detailing (Beam integral with pier)	3.0-In Longitudinal direction 4.0-In transverse direction
4	Bearing/Superstructure	2.0
5	Stopper	1.0
6	Foundations	2.0

Note: In addition to the response reduction factor given above, reinforcement detailing of Piers/Portal Piers shall conform to ductility/capacity design requirements as per Annexure-B of IRS Seismic Code.

6.7.5 Vertical Seismic Coefficient

The seismic zone factor & time period (of Vertical motion) for calculating vertical seismic coefficient shall be considered as per clause 7.3.2 & 9.4.2 of IRS seismic code. The Zone factor for calculating the vertical seismic coefficient will be 2/3*Zone factor i.e. $2/3*0.1=0.067$. For Pier & foundations, while calculating vertical seismic coefficient R=1 shall be considered.

6.7.6 Computation of Fundamental period of vibration

The fundamental time period shall be calculated by any rational method of analysis. Each pier is considered as a single degree of freedom oscillator with mass placed at the Centre of Gravity (COG) of the deck.

The time period can also be calculated based on expression given in Clause 8.1 of IRS Seismic Code, which is as follows:

$$T = 2\pi\sqrt{\frac{\delta}{g}}$$

Where δ = horizontal displacement at the top of pier due to horizontal force (= mg)
Where m = lumped mass at the top of pier.

a) Mass

- Permanent masses (Self Weights, SIDL) of:
  (a) Full span longitudinally, which can be resisted by reaction blocks or POT/Spherical bearings during earthquake, at one side of the pier or half of spans on either side of pier in case seismic is resisted by bearings (For longitudinal seismic)
  (b) Half of spans on either side of pier (For transverse seismic)

7. ANNEXURE-A : LOAD COMBINATION

L/C No.	Descriptions of Load Case	ULS STATIC									
		1001	1002	1003	1004	1005	1101	1102	1103	1104	1105
		Submerged Soil -Design Water Level Case					Saturated / Dry Case				
		(MAX H - MAX V)	(MAX H - MAX V) without LL	(MAX H - MIN V)	(MIN H - MAX V)	(MIN H - MAX V) without LL	(MAX H - MAX V)	(MAX H - MAX V) without LL	(MAX H - MIN V)	(MIN H - MAX V)	(MIN H - MAX V) without LL
1	Self Weight	1.5	1.5	1.0	1.5	1.5	1.5	1.5	1.0	1.5	1.5
2	SIDL	1.5	1.5	1.0	1.5	1.5	1.5	1.5	1.0	1.5	1.5
3	Soil Back Fill	1.5	1.5	1.0	1.5	1.5	1.5	1.5	1.0	1.5	1.5
4	Live Load on concourse & platform	1.5	0	0	1.5	0	1.5	0	0	1.5	0
5	Train Live Load	1.5	0	0	1.5	0	1.5	0	0	1.5	0
6	Lateral Earth Pressure (WL @ Design Water Level*) K0	1.5	1.5	1.5	0	0	0	0	0	0	0
7	Lateral Earth Pressure (WL @ Design Water Level*) Ka	0	0	0	1.0	1.0	0	0	0	0	0
8	Lateral Earth Pressure Sat_ K0 (#)	0	0	0	0	0	1.5	1.5	1.5	0	0
9	Lateral Earth Pressure Dry_ Ka (#)	0	0	0	0	0	0	0	0	1.0	1.0
10	Vertical Surcharge Load	1.5	1.5	0	1.5	1.5	1.5	1.5	0	1.5	1.5
11	Lateral Surcharge load (Towards Right)	0	0	0	0	0	0	0	0	0	0
12	Lateral Surcharge load (Towards Left)	0	0	0	0	0	0	0	0	0	0
13	Lateral Surcharge load (Both Sides)	1.5	1.5	1.5	0	0	1.5	1.5	1.5	0	0
14	Water Pressure at Design Water Level* (Lateral)	1.5	1.5	1.5	1.0	1.0	0	0	0	0	0
15	Water Pressure at Design Water Level* (Vertical) (Uplift)	1.5	1.5	1.0	1.5	1.5	0	0	0	0	0
16	0.075 g Racking Point Force (Towards Right)	0	0	0	0	0	0	0	0	0	0
17	0.075 g Racking Point Force (Towards Left)	0	0	0	0	0	0	0	0	0	0
18	0.075 g Racking Distribution Force (Towards Right)	0	0	0	0	0	0	0	0	0	0
19	0.075 g Racking Distribution Force (Towards Left)	0	0	0	0	0	0	0	0	0	0
20	0.15 g Racking Point Force (Towards Right)	0	0	0	0	0	0	0	0	0	0
21	0.15 g Racking Point Force (Towards Left)	0	0	0	0	0	0	0	0	0	0
22	0.15 g Racking Distribution Force (Towards Right)	0	0	0	0	0	0	0	0	0	0
23	0.15 g Racking Distribution Force (Towards Left)	0	0	0	0	0	0	0	0	0	0

Note:
* During Construction stage HRL shall be considered instead of Design water table for all load combinations. Lateral Earth pressure shall be calculated based on submerged density up to water table and saturated density above water table.
# Lateral Earth Pressure Sat_ K0 shall be calculated with saturated soil density up to GL and Lateral Earth Pressure Dry_ Ka shall be calculated with dry soil density up to GL.

L/C No.	Descriptions of Load Case	ULS SEISMIC (RACKING) CORRESPONDING TO 0.075g											
		2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
		Without LL											
		Submerged Soil -Design Water Level Case											
		(MAX H - MAX V)				(MAX H - MIN V)				(MIN H - MAX V)			
		Point Raking Force		Distributed Raking Force		Point Raking Force		Distributed Raking Force		Point Raking Force		Distributed Raking Force	
		Surcharge/ Raking Towards Right	Surcharge/ Raking Towards Left	Surcharge/ Raking Towards Right	Surcharge/ Raking Towards Left	Surcharge/ Raking Towards Right	Surcharge/ Raking Towards Left	Surcharge/ Raking Towards Right	Surcharge/ Raking Towards Left	Surcharge/ Raking Towards Right	Surcharge/ Raking Towards Left	Surcharge/ Raking Towards Right	Surcharge/ Raking Towards Left
1	Self Weight	1.5	1.5	1.5	1.5	1.0	1.0	1.0	1.0	1.5	1.5	1.5	1.5
2	SIDL	1.5	1.5	1.5	1.5	1.0	1.0	1.0	1.0	1.5	1.5	1.5	1.5
3	Soil Back Fill	1.5	1.5	1.5	1.5	1.0	1.0	1.0	1.0	1.5	1.5	1.5	1.5
4	Live Load on concourse & platform	0	0	0	0	0	0	0	0	0	0	0	0
5	Train Live Load	0	0	0	0	0	0	0	0	0	0	0	0
6	Lateral Earth Pressure (WL @ Design Water Level*) K0	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	0	0	0	0
7	Lateral Earth Pressure (WL @ Design Water Level*) Ka	0	0	0	0	0	0	0	0	1.0	1.0	1.0	1.0
8	Lateral Earth Pressure Sat_ K0 (#)	0	0	0	0	0	0	0	0	0	0	0	0
9	Lateral Earth Pressure Dry_ Ka (#)	0	0	0	0	0	0	0	0	0	0	0	0
10	Vertical Surcharge Load	1.5	1.5	1.5	1.5	1.0	1.0	1.0	1.0	1.5	1.5	1.5	1.5
11	Lateral Surcharge load (Towards Right)	1.5	0	1.5	0	1.5	0.0	1.5	0.0	1.0	0	1.0	0
12	Lateral Surcharge load (Towards Left)	0	1.5	0	1.5	0	1.5	0	1.5	0	1.0	0	1.0
13	Lateral Surcharge load (Both Sides)	0	0	0	0	0	0	0	0	0	0	0	0
14	Water Pressure at Design Water Level* (Lateral)	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.0	1.0	1.0	1.0
15	Water Pressure at Design Water Level* (Vertical) (Uplift)	1.5	1.5	1.5	1.5	1.0	1.0	1.0	1.0	1.5	1.5	1.5	1.5
16	0.075 g Racking Point Force (Towards Right)	1.5	0	0	0	1.5	0	0	0	1.0	0	0	0
17	0.075 g Racking Point Force (Towards Left)	0	1.5	0	0	0	1.5	0	0	0	1.0	0	0
18	0.075 g Racking Distribution Force (Towards Right)	0	0	1.5	0	0	0	1.5	0	0	0	1.0	0
19	0.075 g Racking Distribution Force (Towards Left)	0	0	0	1.5	0	0	0	1.5	0	0	0	1.0
20	0.15 g Racking Point Force (Towards Right)	0	0	0	0	0	0	0	0	0	0	0	0
21	0.15 g Racking Point Force (Towards Left)	0	0	0	0	0	0	0	0	0	0	0	0
22	0.15 g Racking Distribution Force (Towards Right)	0	0	0	0	0	0	0	0	0	0	0	0
23	0.15 g Racking Distribution Force (Towards Left)	0	0	0	0	0	0	0	0	0	0	0	0

Jaipur Metro Rail Corporation Director (Project) JAIPUR

L/C No.	Descriptions of Load Case	ULS SEISMIC (RACKING) CORRESPONDING TO 0.075g											
		2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
		Without LL											
		Saturated / Dry Case											
		(MAX H - MAX V)				(MAX H - MIN V)				(MIN H - MAX V)			
		Point Raking Force		Distributed Raking Force		Point Raking Force		Distributed Raking Force		Point Raking Force		Distributed Raking Force	
		Surcharge/ Raking Towards Right	Surcharge/ Raking Towards Left	Surcharge/ Raking Towards Right	Surcharge/ Raking Towards Left	Surcharge/ Raking Towards Right	Surcharge/ Raking Towards Left	Surcharge/ Raking Towards Right	Surcharge/ Raking Towards Left	Surcharge/ Raking Towards Right	Surcharge/ Raking Towards Left	Surcharge/ Raking Towards Right	Surcharge/ Raking Towards Left
1	Self Weight	1.5	1.5	1.5	1.5	1.0	1.0	1.0	1.0	1.5	1.5	1.5	1.5
2	SIDL	1.5	1.5	1.5	1.5	1.0	1.0	1.0	1.0	1.5	1.5	1.5	1.5
3	Soil Back Fill	1.5	1.5	1.5	1.5	1.0	1.0	1.0	1.0	1.5	1.5	1.5	1.5
4	Live Load on concourse & platform	0	0	0	0	0	0	0	0	0	0	0	0
5	Train Live Load	0	0	0	0	0	0	0	0	0	0	0	0
6	Lateral Earth Pressure (WL @ Design Water Level*) K0	0	0	0	0	0	0	0	0	0	0	0	0
7	Lateral Earth Pressure (WL @ Design Water Level*) Ka	0	0	0	0	0	0	0	0	0	0	0	0
8	Lateral Earth Pressure Sat_ K0 (#)	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	0	0	0	0
9	Lateral Earth Pressure Dry_ Ka (#)	0	0	0	0	0	0	0	0	1.0	1.0	1.0	1.0
10	Vertical Surcharge Load	1.5	1.5	1.5	1.5	1.0	1.0	1.0	1.0	1.5	1.5	1.5	1.5
11	Lateral Surcharge load (Towards Right)	1.5	0	1.5	0	1.5	0.0	1.5	0.0	1.0	0	1.0	0
12	Lateral Surcharge load (Towards Left)	0	1.5	0	1.5	0	1.5	0	1.5	0	1.0	0	1.0
13	Lateral Surcharge load (Both Sides)	0	0	0	0	0	0	0	0	0	0	0	0
14	Water Pressure at Design Water Level* (Lateral)	0	0	0	0	0	0	0	0	0	0	0	0
15	Water Pressure at Design Water Level* (Vertical) (Uplift)	0	0	0	0	0	0	0	0	0	0	0	0
16	0.075 g Racking Point Force (Towards Right)	1.5	0	0	0	1.5	0	0	0	1.0	0	0	0
17	0.075 g Racking Point Force (Towards Left)	0	1.5	0	0	0	1.5	0	0	0	1.0	0	0
18	0.075 g Racking Distribution Force (Towards Right)	0	0	1.5	0	0	0	1.5	0	0	0	1.0	0
19	0.075 g Racking Distribution Force (Towards Left)	0	0	0	1.5	0	0	0	1.5	0	0	0	1.0
20	0.15 g Racking Point Force (Towards Right)	0	0	0	0	0	0	0	0	0	0	0	0
21	0.15 g Racking Point Force (Towards Left)	0	0	0	0	0	0	0	0	0	0	0	0
22	0.15 g Racking Distribution Force (Towards Right)	0	0	0	0	0	0	0	0	0	0	0	0
23	0.15 g Racking Distribution Force (Towards Left)	0	0	0	0	0	0	0	0	0	0	0	0

Jaipur Metro Rail Corporation
Director (Project)
JAIPUR

L/C No.	Descriptions of Load Case	ULS SEISMIC (RACKING) CORRESPONDING TO 0.15g											
		2101	2102	2103	2104	2105	2106	2107	2108	2109	2110	2111	2112
		Without LL											
		Submerged Soil -Design Water Level Case											
		(MAX H - MAX V)				(MAX H - MIN V)				(MIN H - MAX V)			
		Point Raking Force		Distributed Raking Force		Point Raking Force		Distributed Raking Force		Point Raking Force		Distributed Raking Force	
		Surcharge/ Raking Towards Right	Surcharge/ Raking Towards Left	Surcharge/ Raking Towards Right	Surcharge/ Raking Towards Left	Surcharge/ Raking Towards Right	Surcharge/ Raking Towards Left	Surcharge/ Raking Towards Right	Surcharge/ Raking Towards Left	Surcharge/ Raking Towards Right	Surcharge/ Raking Towards Left	Surcharge/ Raking Towards Right	Surcharge/ Raking Towards Left
1	Self Weight	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
2	SIDL	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
3	Soil Back Fill	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
4	Live Load on concourse & platform	0	0	0	0	0	0	0	0	0	0	0	0
5	Train Live Load	0	0	0	0	0	0	0	0	0	0	0	0
6	Lateral Earth Pressure (WL @ Design Water Level*) K0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0	0	0	0
7	Lateral Earth Pressure (WL @ Design Water Level*) Ka	0	0	0	0	0	0	0	0	1.0	1.0	1.0	1.0
8	Lateral Earth Pressure Sat_ K0 (#)	0	0	0	0	0	0	0	0	0	0	0	0
9	Lateral Earth Pressure Dry_ Ka (#)	0	0	0	0	0	0	0	0	0	0	0	0
10	Vertical Surcharge Load	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
11	Lateral Surcharge load (Towards Right)	1.0	0	1.0	0	1.0	0.0	1.0	0.0	1.0	0	1.0	0
12	Lateral Surcharge load (Towards Left)	0	1.0	0	1.0	0	1.0	0	1.0	0	1.0	0	1.0
13	Lateral Surcharge load (Both Sides)	0	0	0	0	0	0	0	0	0	0	0	0
14	Water Pressure at Design Water Level* (Lateral)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
15	Water Pressure at Design Water Level* (Vertical) (Uplift)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
16	0.075 g Racking Point Force (Towards Right)	0	0	0	0	0	0	0	0	0	0	0	0
17	0.075 g Racking Point Force (Towards Left)	0	0	0	0	0	0	0	0	0	0	0	0
18	0.075 g Racking Distribution Force (Towards Right)	0	0	0	0	0	0	0	0	0	0	0	0
19	0.075 g Racking Distribution Force (Towards Left)	0	0	0	0	0	0	0	0	0	0	0	0
20	0.15 g Racking Point Force (Towards Right)	1.0	0	0	0	1.0	0	0	0	1.0	0	0	0
21	0.15 g Racking Point Force (Towards Left)	0	1.0	0	0	0	1.0	0	0	0	1.0	0	0
22	0.15 g Racking Distribution Force (Towards Right)	0	0	1.0	0	0	0	1.0	0	0	0	1.0	0
23	0.15 g Racking Distribution Force (Towards Left)	0	0	0	1.0	0	0	0	1.0	0	0	0	1.0

Jaipur Metro Rail Corporation
Director (Project)
JAIPUR

L/C No.	Descriptions of Load Case	ULS SEISMIC (RACKING) CORRESPONDING TO 0.15g											
		2125	2126	2127	2128	2129	2130	2131	2132	2133	2134	2135	2136
		Without LL											
		Saturated / Dry Case											
		(MAX H - MAX V)				(MAX H - MIN V)				(MIN H - MAX V)			
		Point Raking Force		Distributed Raking Force		Point Raking Force		Distributed Raking Force		Point Raking Force		Distributed Raking Force	
		Surcharge/ Raking Towards Right	Surcharge/ Raking Towards Left	Surcharge/ Raking Towards Right	Surcharge/ Raking Towards Left	Surcharge/ Raking Towards Right	Surcharge/ Raking Towards Left	Surcharge/ Raking Towards Right	Surcharge/ Raking Towards Left	Surcharge/ Raking Towards Right	Surcharge/ Raking Towards Left	Surcharge/ Raking Towards Right	Surcharge/ Raking Towards Left
1	Self Weight	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
2	SIDL	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
3	Soil Back Fill	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
4	Live Load on concourse & platform	0	0	0	0	0	0	0	0	0	0	0	0
5	Train Live Load	0	0	0	0	0	0	0	0	0	0	0	0
6	Lateral Earth Pressure (WL @ Design Water Level*) K0	0	0	0	0	0	0	0	0	0	0	0	0
7	Lateral Earth Pressure (WL @ Design Water Level*) Ka	0	0	0	0	0	0	0	0	0	0	0	0
8	Lateral Earth Pressure Sat_ K0 (#)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0	0	0	0
9	Lateral Earth Pressure Dry_ Ka (#)	0	0	0	0	0	0	0	0	1.0	1.0	1.0	1.0
10	Vertical Surcharge Load	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
11	Lateral Surcharge load (Towards Right)	1.0	0	1.0	0	1.0	0.0	1.0	0.0	1.0	0	1.0	0
12	Lateral Surcharge load (Towards Left)	0	1.0	0	1.0	0	1.0	0	1.0	0	1.0	0	1.0
13	Lateral Surcharge load (Both Sides)	0	0	0	0	0	0	0	0	0	0	0	0
14	Water Pressure at Design Water Level* (Lateral)	0	0	0	0	0	0	0	0	0	0	0	0
15	Water Pressure at Design Water Level* (Vertical) (Uplift)	0	0	0	0	0	0	0	0	0	0	0	0
16	0.075 g Racking Point Force (Towards Right)	0	0	0	0	0	0	0	0	0	0	0	0
17	0.075 g Racking Point Force (Towards Left)	0	0	0	0	0	0	0	0	0	0	0	0
18	0.075 g Racking Distribution Force (Towards Right)	0	0	0	0	0	0	0	0	0	0	0	0
19	0.075 g Racking Distribution Force (Towards Left)	0	0	0	0	0	0	0	0	0	0	0	0
20	0.15 g Racking Point Force (Towards Right)	1.0	0	0	0	1.0	0	0	0	1.0	0	0	0
21	0.15 g Racking Point Force (Towards Left)	0	1.0	0	0	0	1.0	0	0	0	1.0	0	0
22	0.15 g Racking Distribution Force (Towards Right)	0	0	1.0	0	0	0	1.0	0	0	0	1.0	0
23	0.15 g Racking Distribution Force (Towards Left)	0	0	0	1.0	0	0	0	1.0	0	0	0	1.0

Jaipur Metro Rail Corporation Ltd.
Director (Project)
JAIPUR

L/C No.	Descriptions of Load Case	ULS SEISMIC (RACKING) CORRESPONDING TO 0.075g											
		2201	2202	2203	2204	2205	2206	2207	2208	2209	2210	2211	2212
		With LL											
		Submerged Soil -Design Water Level Case											
		(MAX H - MAX V)				(MAX H - MIN V)				(MIN H - MAX V)			
		Point Raking Force		Distributed Raking Force		Point Raking Force		Distributed Raking Force		Point Raking Force		Distributed Raking Force	
		Surcharge/ Raking Towards Right	Surcharge/ Raking Towards Left	Surcharge/ Raking Towards Right	Surcharge/ Raking Towards Left	Surcharge/ Raking Towards Right	Surcharge/ Raking Towards Left	Surcharge/ Raking Towards Right	Surcharge/ Raking Towards Left	Surcharge/ Raking Towards Right	Surcharge/ Raking Towards Left	Surcharge/ Raking Towards Right	Surcharge/ Raking Towards Left
1	Self Weight	1.2	1.2	1.2	1.2	1.0	1.0	1.0	1.0	1.2	1.2	1.2	1.2
2	SIDL	1.2	1.2	1.2	1.2	1.0	1.0	1.0	1.0	1.2	1.2	1.2	1.2
3	Soil Back Fill	1.2	1.2	1.2	1.2	1.0	1.0	1.0	1.0	1.2	1.2	1.2	1.2
4	Live Load on concourse & platform	0.6	0.6	0.6	0.6	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6
5	Train Live Load	0.6	0.6	0.6	0.6	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6
6	Lateral Earth Pressure (WL @ Design Water Level*) K0	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	0	0	0	0
7	Lateral Earth Pressure (WL @ Design Water Level*) Ka	0	0	0	0	0	0	0	0	1.0	1.0	1.0	1.0
8	Lateral Earth Pressure Sat_ K0 (#)	0	0	0	0	0	0	0	0	0	0	0	0
9	Lateral Earth Pressure Dry_ Ka (#)	0	0	0	0	0	0	0	0	0	0	0	0
10	Vertical Surcharge Load	1.2	1.2	1.2	1.2	1.0	1.0	1.0	1.0	1.2	1.2	1.2	1.2
11	Lateral Surcharge load (Towards Right)	1.2	0	1.2	0	1.2	0.0	1.2	0.0	1.0	0	1.0	0
12	Lateral Surcharge load (Towards Left)	0	1.2	0	1.2	0	1.2	0	1.2	0	1.0	0	1.0
13	Lateral Surcharge load (Both Sides)	0	0	0	0	0	0	0	0	0	0	0	0
14	Water Pressure at Design Water Level* (Lateral)	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.0	1.0	1.0	1.0
15	Water Pressure at Design Water Level* (Vertical) (Uplift)	1.2	1.2	1.2	1.2	1.0	1.0	1.0	1.0	1.2	1.2	1.2	1.2
16	0.075 g Racking Point Force (Towards Right)	1.2	0	0	0	1.2	0	0	0	1.0	0	0	0
17	0.075 g Racking Point Force (Towards Left)	0	1.2	0	0	0	1.2	0	0	0	1.0	0	0
18	0.075 g Racking Distribution Force (Towards Right)	0	0	1.2	0	0	0	1.2	0	0	0	1.0	0
19	0.075 g Racking Distribution Force (Towards Left)	0	0	0	1.2	0	0	0	1.2	0	0	0	1.0
20	0.15 g Racking Point Force (Towards Right)	0	0	0	0	0	0	0	0	0	0	0	0
21	0.15 g Racking Point Force (Towards Left)	0	0	0	0	0	0	0	0	0	0	0	0
22	0.15 g Racking Distribution Force (Towards Right)	0	0	0	0	0	0	0	0	0	0	0	0
23	0.15 g Racking Distribution Force (Towards Left)	0	0	0	0	0	0	0	0	0	0	0	0

Jaipur Metro Rail Corporation
Director (Project)
JAIPUR

L/C No.	Descriptions of Load Case	ULS SEISMIC (RACKING) CORRESPONDING TO 0.075g											
		2225	2226	2227	2228	2229	2230	2231	2232	2233	2234	2235	2236
		With LL											
		Saturated / Dry Case											
		(MAX H - MAX V)				(MAX H - MIN V)				(MIN H - MAX V)			
		Point Raking Force		Distributed Raking Force		Point Raking Force		Distributed Raking Force		Point Raking Force		Distributed Raking Force	
		Surcharge/ Raking Towards Right	Surcharge/ Raking Towards Left	Surcharge/ Raking Towards Right	Surcharge/ Raking Towards Left	Surcharge/ Raking Towards Right	Surcharge/ Raking Towards Left	Surcharge/ Raking Towards Right	Surcharge/ Raking Towards Left	Surcharge/ Raking Towards Right	Surcharge/ Raking Towards Left	Surcharge/ Raking Towards Right	Surcharge/ Raking Towards Left
1	Self Weight	1.2	1.2	1.2	1.2	1.0	1.0	1.0	1.0	1.2	1.2	1.2	1.2
2	SIDL	1.2	1.2	1.2	1.2	1.0	1.0	1.0	1.0	1.2	1.2	1.2	1.2
3	Soil Back Fill	1.2	1.2	1.2	1.2	1.0	1.0	1.0	1.0	1.2	1.2	1.2	1.2
4	Live Load on concourse & platform	0.6	0.6	0.6	0.6	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6
5	Train Live Load	0.6	0.6	0.6	0.6	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6
6	Lateral Earth Pressure (WL @ Design Water Level*) K0	0	0	0	0	0	0	0	0	0	0	0	0
7	Lateral Earth Pressure (WL @ Design Water Level*) Ka	0	0	0	0	0	0	0	0	0	0	0	0
8	Lateral Earth Pressure Sat_ K0 (#)	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	0	0	0	0
9	Lateral Earth Pressure Dry_ Ka (#)	0	0	0	0	0	0	0	0	1.0	1.0	1.0	1.0
10	Vertical Surcharge Load	1.2	1.2	1.2	1.2	1.0	1.0	1.0	1.0	1.2	1.2	1.2	1.2
11	Lateral Surcharge load (Towards Right)	1.2	0	1.2	0	1.2	0.0	1.2	0.0	1.0	0	1.0	0
12	Lateral Surcharge load (Towards Left)	0	1.2	0	1.2	0	1.2	0	1.2	0	1.0	0	1.0
13	Lateral Surcharge load (Both Sides)	0	0	0	0	0	0	0	0	0	0	0	0
14	Water Pressure at Design Water Level* (Lateral)	0	0	0	0	0	0	0	0	0	0	0	0
15	Water Pressure at Design Water Level* (Vertical) (Uplift)	0	0	0	0	0	0	0	0	0	0	0	0
16	0.075 g Racking Point Force (Towards Right)	1.2	0	0	0	1.2	0	0	0	1.0	0	0	0
17	0.075 g Racking Point Force (Towards Left)	0	1.2	0	0	0	1.2	0	0	0	1.0	0	0
18	0.075 g Racking Distribution Force (Towards Right)	0	0	1.2	0	0	0	1.2	0	0	0	1.0	0
19	0.075 g Racking Distribution Force (Towards Left)	0	0	0	1.2	0	0	0	1.2	0	0	0	1.0
20	0.15 g Racking Point Force (Towards Right)	0	0	0	0	0	0	0	0	0	0	0	0
21	0.15 g Racking Point Force (Towards Left)	0	0	0	0	0	0	0	0	0	0	0	0
22	0.15 g Racking Distribution Force (Towards Right)	0	0	0	0	0	0	0	0	0	0	0	0

Jaipur Metro Rail Corporation Ltd. Director (Project) JAIPUR

23	0.15 g Racking	0	0	0	0	0	0	0	0	0	0	0	0
	Distribution Force (Towards Left)												

L/C No.	Case Descriptions of Load	ULS SEISMIC (RACKING) CORRESPONDING TO 0.15g											
		2301	2302	2303	2304	2305	2306	2307	2308	2309	2310	2311	2312
		With LL											
		Submerged Soil -Design Water Level Case											
		(MAX H - MAX V)				(MAX H - MIN V)				(MIN H - MAX V)			
		Point Raking Force		Distributed Raking Force		Point Raking Force		Distributed Raking Force		Point Raking Force		Distributed Raking Force	
		Surcharge/ Raking Towards Right	Surcharge/ Raking Towards Left	Surcharge/ Raking Towards Right	Surcharge/ Raking Towards Left	Surcharge/ Raking Towards Right	Surcharge/ Raking Towards Left	Surcharge/ Raking Towards Right	Surcharge/ Raking Towards Left	Surcharge/ Raking Towards Right	Surcharge/ Raking Towards Left	Surcharge/ Raking Towards Right	Surcharge/ Raking Towards Left
1	Self Weight	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
2	SIDL	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
3	Soil Back Fill	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
4	Live Load on concourse & platform	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
5	Train Live Load	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
6	Lateral Earth Pressure (WL @ Design Water Level*) K0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0	0	0	0
7	Lateral Earth Pressure (WL @ Design Water Level*) Ka	0	0	0	0	0	0	0	0	1.0	1.0	1.0	1.0
8	Lateral Earth Pressure Sat_ K0 (#)	0	0	0	0	0	0	0	0	0	0	0	0
9	Lateral Earth Pressure Dry_ Ka (#)	0	0	0	0	0	0	0	0	0	0	0	0
10	Vertical Surcharge Load	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
11	Lateral Surcharge load (Towards Right)	1.0	0	1.0	0	1.0	0.0	1.0	0.0	1.0	0	1.0	0
12	Lateral Surcharge load (Towards Left)	0	1.0	0	1.0	0	1.0	0	1.0	0	1.0	0	1.0
13	Lateral Surcharge load (Both Sides)	0	0	0	0	0	0	0	0	0	0	0	0
14	Water Pressure at Design Water Level* (Lateral)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
15	Water Pressure at Design Water Level* (Vertical) (Uplift)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
16	0.075 g Racking Point Force (Towards Right)	0	0	0	0	0	0	0	0	0	0	0	0
17	0.075 g Racking Point Force (Towards Left)	0	0	0	0	0	0	0	0	0	0	0	0
18	0.075 g Racking Distribution Force (Towards Right)	0	0	0	0	0	0	0	0	0	0	0	0
19	0.075 g Racking Distribution Force (Towards Left)	0	0	0	0	0	0	0	0	0	0	0	0
20	0.15 g Racking Point Force (Towards Right)	1.0	0	0	0	1.0	0	0	0	1.0	0	0	0
21	0.15 g Racking Point Force (Towards Left)	0	1.0	0	0	0	1.0	0	0	0	1.0	0	0
22	0.15 g Racking Distribution Force (Towards Right)	0	0	1.0	0	0	0	1.0	0	0	0	1.0	0
23	0.15 g Racking Distribution Force (Towards Left)	0	0	0	1.0	0	0	0	1.0	0	0	0	1.0

L/C No.	Descriptions of	ULS SEISMIC (RACKING) CORRESPONDING TO 0.15g

	Load Case	2325	2326	2327	2328	2329	2330	2331	2332	2333	2334	2335	2336
		With LL											
		Saturated / Dry Case											
		(MAX H - MAX V)				(MAX H - MIN V)				(MIN H - MAX V)			
		Point Raking Force		Distributed Raking Force		Point Raking Force		Distributed Raking Force		Point Raking Force		Distributed Raking Force	
		Surcharge/ Raking Towards Right	Surcharge/ Raking Towards Left	Surcharge/ Raking Towards Right	Surcharge/ Raking Towards Left	Surcharge/ Raking Towards Right	Surcharge/ Raking Towards Left	Surcharge/ Raking Towards Right	Surcharge/ Raking Towards Left	Surcharge/ Raking Towards Right	Surcharge/ Raking Towards Left	Surcharge/ Raking Towards Right	Surcharge/ Raking Towards Left
1	Self Weight	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
2	SIDL	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
3	Soil Back Fill	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
4	Live Load on concourse & platform	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
5	Train Live Load	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
6	Lateral Earth Pressure (WL @ Design Water Level*) K0	0	0	0	0	0	0	0	0	0	0	0	0
7	Lateral Earth Pressure (WL @ Design Water Level*) Ka	0	0	0	0	0	0	0	0	0	0	0	0
8	Lateral Earth Pressure Sat_ K0 (#)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0	0	0	0
9	Lateral Earth Pressure Dry_ Ka (#)	0	0	0	0	0	0	0	0	1.0	1.0	1.0	1.0
10	Vertical Surcharge Load	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
11	Lateral Surcharge load (Towards Right)	1.0	0	1.0	0	1.0	0.0	1.0	0.0	1.0	0	1.0	0
12	Lateral Surcharge load (Towards Left)	0	1.0	0	1.0	0	1.0	0	1.0	0	1.0	0	1.0
13	Lateral Surcharge load (Both Sides)	0	0	0	0	0	0	0	0	0	0	0	0
14	Water Pressure at Design Water Level* (Lateral)	0	0	0	0	0	0	0	0	0	0	0	0
15	Water Pressure at Design Water Level* (Vertical) (Uplift)	0	0	0	0	0	0	0	0	0	0	0	0
16	0.075 g Racking Point Force (Towards Right)	0	0	0	0	0	0	0	0	0	0	0	0
17	0.075 g Racking Point Force (Towards Left)	0	0	0	0	0	0	0	0	0	0	0	0
18	0.075 g Racking Distribution Force (Towards Right)	0	0	0	0	0	0	0	0	0	0	0	0
19	0.075 g Racking Distribution Force (Towards Left)	0	0	0	0	0	0	0	0	0	0	0	0
20	0.15 g Racking Point Force (Towards Right)	1.0	0	0	0	1.0	0	0	0	1.0	0	0	0
21	0.15 g Racking Point Force (Towards Left)	0	1.0	0	0	0	1.0	0	0	0	1.0	0	0
22	0.15 g Racking Distribution Force (Towards Right)	0	0	1.0	0	0	0	1.0	0	0	0	1.0	0
23	0.15 g Racking Distribution Force (Towards Left)	0	0	0	1.0	0	0	0	1.0	0	0	0	1.0

	SLS									
	3001	3002	3003	3004	3005	3101	3102	3103	3104	3105
C	Submerged Soil -Design Water Level Case					Saturated / Dry Case				

Jaipur Metro Rail Corporation
Director (Project)
JAIPUR

No.	Descriptions of Load Case	(MAX H - MAX V)	(MAX H - MAX V) without LL	(MAX H - MIN V)	(MIN H - MAX V)	(MIN H - MAX V) without LL	(MAX H - MAX V)	(MAX H - MAX V) without LL	(MAX H - MIN V)	(MIN H - MAX V)	(MIN H - MAX V) without LL
1	Self Weight	1	1	1	1	1	1	1	1	1	1
2	SIDL	1	1	1	1	1	1	1	1	1	1
3	Soil Back Fill	1	1	1	1	1	1	1	1	1	1
4	Live Load on concourse & platform	1	0	0	1	0	1	0	0	1	0
5	Train Live Load	1	0	0	1	0	1	0	0	1	0
6	Lateral Earth Pressure (WL @ Design Water Level*) K0	1	1	1	0	0	0	0	0	0	0
7	Lateral Earth Pressure (WL @ Design Water Level*) Ka	0	0	0	1	1	0	0	0	0	0
8	Lateral Earth Pressure Sat_ K0 (#)	0	0	0	0	0	1	1	1	0	0
9	Lateral Earth Pressure Dry_ Ka (#)	0	0	0	0	0	0	0	0	1	1
10	Vertical Surcharge Load	1	1	0	1	1	1	1	0	1	1
11	Lateral Surcharge load (Towards Right)	0	0	0	0	0	0	0	0	0	0
12	Lateral Surcharge load (Towards Left)	0	0	0	0	0	0	0	0	0	0
13	Lateral Surcharge load (Both Sides)	1	1	1	0	0	1	1	1	0	0
14	Water Pressure at Design Water Level* (Lateral)	1	1	1	1	1	0	0	0	0	0
15	Water Pressure at Design Water Level* (Vertical) (Uplift)	1	1	1	1	1	0	0	0	0	0
16	0.075 g Racking Point Force (Towards Right)	0	0	0	0	0	0	0	0	0	0
17	0.075 g Racking Point Force (Towards Left)	0	0	0	0	0	0	0	0	0	0
18	0.075 g Racking Distribution Force (Towards Right)	0	0	0	0	0	0	0	0	0	0
19	0.075 g Racking Distribution Force (Towards Left)	0	0	0	0	0	0	0	0	0	0
20	0.15 g Racking Point Force (Towards Right)	0	0	0	0	0	0	0	0	0	0
21	0.15 g Racking Point Force (Towards Left)	0	0	0	0	0	0	0	0	0	0
22	0.15 g Racking Distribution Force (Towards Right)	0	0	0	0	0	0	0	0	0	0
23	0.15 g Racking Distribution Force (Towards Left)	0	0	0	0	0	0	0	0	0	0

S.NO	CLAUSE NO./PAGE NO/SECTION etc.	Heading	Query of Bidder	Clarification by Engineer
		General	Façade consultancy will be in URCC scope? Need clarity	Facade is an integral part of station building. Kindly refer Tender drawings. **Hence it is in scope of Contractor and also refer Employer Requirements Functional clause 2.10 (xii)**
12		General	Please provide Exterior finishes schedule.	Finishes schedule is already provided in Tender drawings.**JMRC-STN-TRN-TED-ARP-11000&JMRC-STN-AJR-TED-ARP-11000**
13		General	FOB will not have roof cover? Required clarity	All FOB's connecting to station building shall have roof cover.
14		General	Interior 3d rendering required	Preliminary design Tender drawings are already provided.
15		General	Plumbing & Drainage Drawings required	**Conceptual designs are also shown in given Tender drawings volume V,VID-JMRC-STR-TD-00204A ,VID-JMRC-STR-TD-00204B,VID-JMRC-STR-TD-00204C**
16		General	Need Location of WTP Plant room	WTP shall be placed in pump room as per requirements during detail design development.
17		General	Need Location of STP	STP will be located as per sewage disposal scheme during detail design.
18		General	Need Domestic water demand calculation and foot fall for the station	Water tanks location and size are already shown in Architectural Tender drawings.
19		General	Need Details of Percolation pit for Rainwater Harvesting	IS 15797 2008 may be referred
20		General	Need Details of Storm Water Drain	The same shall be proposed by the contractor in detail design stage as per storm water drainage scheme and approved by Engineer.
21	Volume - IV / Part 1 - ODS Page No. 27	12.1	Please provide the junction details between existing line (pier with box segment vaiduct) and proposed new Twin U-Girder.(at connection area)	**U Girder is not permitted. Any pre cast girder like T/I Girder may be used. The junction detail have to be developed by Contractor's DDC based on loading and existing structure.**
22		General	There is no private vacant land for casting yard, around 15 km of the ajmer station. We found some govt vacant land near ajmeer station. Whether we can use this free of cost or rental basis.	Not agreed. 35000 sqm casting yard area shall be provided within lead of 45km. **Please Refer SN-21 of Summary Sheet of Addendum-01.**
23		General	Whether we can go with economical size for viaduct, Pier and Pier Cap as per our design OR we need to match with exixting / other. If so, please provide the details.	Any size may be adopted, as permissible within the tender conditions on approval of Engineer.
24		General	Please provide the typical drawing for pier.	Please refer tender drawings **VID-JMRC-STR-TD-00101, VID-JMRC-STR-TD-00102 & VID-JMRC-STR-TD-00102**

S. NO	CLAUSE NO./PAGE NO/SECTION etc.	Heading	Query of Bidder	Clarification by Engineer
32	VIII Cl. 1.1.2 Case No. 3	Bid Security	The amount of bid security as given in the reference tender clause amounts to ***5.21 crores i.e. 2% of the approximate cost of work which is unusual.*** Bidder requests to reduce the same to ***1% of the project cost similar to other metros and Govt departments i.e. INR 2.6 crores***	Not agreed
33	GCC/ FOB/ Employer's Requirements	GCC Cl. 8.5 & FOB Appendix 1 & Employer's Requirements Appendix 2B	Bidder requests to issue an amendment stating ***"Delay Damages levied will be refunded if the other key dates or overall completion date is adhered to".*** Kindly consider the same.	Not agreed
34	GCC Cl. 4.2	Performance Security Amount	Bidder requests to consider the performance security as ***five percent of the amount of work order in case of procurement of works.***	Not agreed
35	Vol-III, Employer's Requirement - Functional	2.1.3	Kindly provide ***the load details of Radio Mast to be considered*** in the design of Entry/Exit structures.	Bidder may propose his own structure. It shall be approved by Engineer.
36	Vol-III, Employer's Requirement - Functional	2.1.1 Page no. 14 Scope Under Lumpsum Price	There seems ***discrepancy in both the reference specifications as in the Employer's Requirements the superstructure is mentioned as T/I Girder while it is given as Twin U-Girder in the ODS.*** Kindly clarify the exact type of superstructure. Bidder requests to ammend the clause in ODS to "The superstructure of the Viaduct may comprise of simply supported Twin U-Girder ***OR T/I-Girder***."	**U Girder is not permitted. Any pre cast girder like T/I Girder may be used.**
37	Vol-IV, ODS	12.1 Superstructure system of Viaduct Page no. 27 of ODS		
38	Vol-V, Tender Drawings (GAD)	GEN-JMRC-1D-ALG-TD-002 / 003 V	Is the loop line beyond Ajmer Road Chauraha station included in the scope of work of the contractor? If yes, then kindly specify the exact alignment & start and end chainages for the loop line.	**Yes, it is included in scope of work of the contractor. For total loop line length please refer Drawing No GEN-JMRC-TD-001 "Sheet 01 of 01""List of Drawings for Elevated Stretch"; SN-26 & 27.**
39	Vol-IV, ODS	2. Outline design specifications for Viaduct	Bidder understands that Load combination shall be as per Table 12 of IRS-CBC. And point number 7 and 8 in Notes of Clause 7.1 shall be deleted or kindly clarify the combination to be considered.	No change in tender conditions.
40	Vol-5	Drg. No.VID-JMRC-ST-TD-00101	1) Please confirm that the reference drawing is for reference purpose only and the bidder can use any no. of girder in the standard I-girder superstructure. a 2) Please confirm that bidder can use precast as well as cast-in situ I-girder and pier caps. 3) Please confirm that elastomeric bearing is allowed in both standard and special spans.	No change in tender conditions.