

BIDDING DOCUMENTS



MUMBAI METRO LINE 3 (COLABA-BANDRA-SEEPZ)

CONTRACT MM3-CBS-DEQ-9-02

Design, Manufacture, Supply, Installation, Testing, Commissioning
and Comprehensive Maintenance Service of
Automatic Train Wash Plant
for Project "Mumbai Metro Line-3"

JICA Loan Agreement No ID- P 268 dated 29/03/2018.

Bidding Documents

PART 1- Bidding Procedure

PART 2- Employer's Requirements

PART 3- Conditions of Contract and Contract Forms

PART 4- Drawings

January - 2020

**Mumbai Metro Rail Corporation Ltd
MMRCL Line 3 Transit Office,
Wing 'A', 'E' Block,
Bandra-Kurla Complex,
Bandra (East), Mumbai 400 051, India**



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Automatic Train Wash Plant
for Project "Mumbai Metro Line-3"

PART 1 BIDDING PROCEDURES

Section I	Instructions to Bidders
Section II	Bid Data Sheet
Section III	Evaluation and Qualification Criteria
Section IV-A	Bidding Forms
Section IV-B	Pricing Document
Section V	Eligible Source Countries of Japanese ODA Loans

January – 2020

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Section VI-A	Employer's Requirements – General Specifications
Section VI-B	Employer's Requirements – Technical Specifications
PART 3	Conditions of Contract and Contract Forms
Section VII	General Conditions of Contract (GCC)
Section VIII	Particular Conditions of contract (PCC)
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Section X	Special Conditions for Comprehensive Maintenance Service
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Section XI	Drawings



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Automatic Train Wash Plant
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Part 1

Bidding Procedures

Section I

Instructions to Bidders

January - 2020

**Mumbai Metro Rail Corporation Ltd
MMRC Line 3 Transit Office,
Wing A, Block E,
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INSTRUCTIONS TO BIDDERS (ITB)

The Instructions to Bidders governing this bidding process are the “Instructions to Bidders included in Option A, Single-Stage Two-Envelope Bidding, Section I,” of the Standard Bidding Documents for Procurement of Plant Design, Supply and Installation (version 1.1) Published by JICA in February 2013. Those Instructions to Bidders are available on the JICA’s web site shown below:

https://www.jica.go.jp/english/our_work/types_of_assistance/oda_loans/oda_op_info/guide/tender/c8h0vm0000aoesst-att/plant.pdf

“Instructions to Bidders included in Option A, Single-Stage Two-Envelope Bidding, Section I,” is available at page numbers 31 to 63.

A copy of the Instructions to Bidders is not attached to these Bidding Documents.



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Part 1

Bidding Procedure

Section II

Bid Data Sheet

January - 2020

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MMRC Line 3 Transit Office,
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BID DATA SHEET (BDS)

A. General	
ITB 1.1	The number of the Invitation for Bids is MM3-CBS-DEQ-9-02
ITB 1.1	The Employer is Mumbai Metro Rail Corporation Ltd. (MMRC)
ITB 1.1	The name and identification of the contract comprising this International Competitive Bidding (ICB) are “Design, Manufacture, Supply, Installation, Testing & Commissioning (Part A) and Comprehensive Maintenance Service (Part B)” of Automatic Train Wash Plant (hereinafter termed as Wash Plant) as per the Technical Specifications, Section VI-B, Part 2.
ITB 2.1	The Borrower is Government of India.
ITB 2.1	The number of the Loan Agreement is ID-P268. The amount of a Japanese ODA Loan is One hundred (100) billion Japanese Yen for Mumbai Metro Line 3 Project. The signed date of the Loan Agreement is 29th March 2018.
ITB 2.1	The name of the Project is Mumbai Metro Line 3 (Colaba-Bandra-SEEPZ).
ITB 2.2	The applicable Guidelines for Procurement under Japanese ODA Loans are those published in April 2012.
ITB 2.4	Add new Sub Clause ITB 2.4: Comprehensive Maintenance Service which is detailed in Clause 4, Section VI-B, Part 2 and Priced in Schedule No. 8, Pricing Document, Section IV-B, Part 1 are not covered under the Japanese ODA Loan stated in 2.1 above. The Borrower will take appropriate measures for financing this part of the work.
ITB 3.1 (c)	A list of debarred firms and individuals is available at the World Bank’s website: www.worldbank.org/debarr
ITB 3.1(d)	Add new Sub-Clause ITB 3.1(d) Will recognize a Contractor as ineligible to be awarded a Contract if the Contractor or Sub Contractor has been debarred by Delhi Metro Rail Corporation and/or other Metro Rail Corporation chaired by The Secretary, Ministry of Housing & Urban Affairs, Government of India, with the prior concurrence of JICA, as on the due date of submission of Bid.
ITB 4.1 (c)	Add new Sub-clause ITB 4.1 (c) “Joint Venture (JV) also implies Consortium.
ITB 4.5	This bidding is not subject to prequalification.



B. Bidding Documents	
ITB 6.1	<p>Replace Clause 6.1 with the following: The Bidding Documents consist of Parts 1, 2, 3 & 4 which include all the Sections indicated below and shall be read in conjunction with any Addenda issued in accordance with ITB 8.</p> <p>Part 1 - Bidding Procedures Section I: Instructions to Bidders (ITB) Section II: Bid Data Sheet (BDS) Section III: Evaluation and Qualification Criteria Section IV-A: Bidding Forms Section IV-B: Pricing Document Section V: Eligible Source Countries of Japanese ODA Loan</p> <p>Part 2 - Employer's Requirements Section VI-A: Employer's Requirements – General Specifications Section VI-B: Employer's Requirements – Technical Specifications.</p> <p>Part 3 - Conditions of Contract and Contract Forms Section VII: General Conditions of Contract (GC) Section VIII: Particular Conditions of Contract (PC) Section IX: Contract Forms Section X: Special Conditions for Comprehensive Maintenance Service Contract</p> <p>Part 4 – Drawings Section XI: Drawings The Bidder shall check the pages of all documents against page numbers given in the Contents Page to each Part/Section, and in the event of discovery of any discrepancy, the Bidder shall inform the Employer forthwith.</p>
ITB 7.1	<p>The Employer's address (for clarification purposes only) is: Attention: (Mr.) Rajeev, General Manager (Rolling Stock) Mumbai Metro Rail Corporation Ltd, MMRC Line 3 Transit Office, Wing 'A', 'E' Block, Bandra-Kurla Complex, Bandra (East), Mumbai 400 051, India. Telephone: +91 22 26384638 Facsimile number: +91 22 26592005 Email Id: rajeev@mmrc.com</p>



ITB 7.1	Replace the second sentence in ITB 7.1 with the following: The Employer will respond in writing to any request for clarification, provided that such request is received no later than twenty-one (21) days prior to the deadline for submission of Bids.
ITB 7.1	Responses to any request for clarification, if any, will be published on the Employer's web page: www.mmrcl.com
ITB 7.4	A pre-bid meeting will take place at the following date, time and place: Date: 18th Feb 2020 Time: 11:30 hrs. Place: Mumbai Metro Rail Corporation Ltd, MMRCL Line 3 Transit Office, Wing 'A', 'E' Block, Bandra-Kurla Complex, Bandra (East), Mumbai 400 051, India. No site visit will be conducted by the Employer.
ITB 7.4	Add the following at the end of ITB 7.4: Attending pre-bid meeting is not mandatory.
ITB 8.2	Addenda, if any, will be published on the Employer's web page.
C. Preparation of Bids	
ITB 10.1	The language of the Bid as well as of all correspondence is English .
ITB 11.1	Insert the following sentence at the end of ITB 11.1: All documents must be spiral/hard bound and numbered. No loose papers will be accepted.
ITB 11.2(0)	The Bidder shall submit with its Technical Bid "Original Bidding Documents including all addendums (if any) duly stamped and signed at each page."
ITB 11.3(d)	The Bidder shall submit with its Price Bid the following additional documents: None.
ITB 13.1	Alternative Bids are not permitted.
TB 14.2	Add new Sub-Clause ITB 14.2: Purchase Preference to local suppliers: Definitions: "Local Supplier" means a supplier or service provider whose product or service offered for procurement meets the minimum of 50% local content for the whole amount of the Contract. "Local Content" means the amount of value added in India which shall be the total value of the item procured (excluding net domestic indirect taxes) minus the value of imported content in the item (including all customs duties) as a proportion of the total value, in percent. The Bidder who meets the requirements of Local Supplier shall be eligible for purchase preference. The margin of Purchase Preference for Local Suppliers shall be 10%.



	Local Suppliers shall give undertaking for certifying Local Content as per Bid Form 20 , Bid Forms, Section IV-A, Part 1.
ITB 15.2	Not applicable.
ITB 16.1 (b)	The period following completion of Plant and Installation Services during which spare parts, special tools, etc. shall be available is minimum 10 Years post-DLP.
ITB 18.1	Insert the following sentence at the end of ITB 18.1: Bidder shall quote for the entire Design, Manufacture, Supply, Installation, Testing & Commissioning and Comprehensive Maintenance Service on single responsibility basis.
ITB 18.3	Replace ITB 18.3 with the following: Bidders shall give a breakdown of the prices in the manner and detail called for in the Pricing Document Section IV-B.
ITB 18.4	Replace ITB 18.4 with the following: Pricing documents shall comprise of nine (9) schedules as given in Section IV-B and listed below: Schedule No.1: Plant, to be supplied from abroad including offshore manufacture, dispatch, completion of shipping to port in India, inland transportation, delivery and receipt at Mumbai Metro Line 3 site. Schedule No.2: Plant, to be supplied; from within India, including Indigenous manufacture dispatch inland transportation in India delivery and receipt at Mumbai Metro Line 3 site. Schedule No.3: Design Services Schedule No.4: Installation, Testing & Commissioning, and Other Services. Schedule No.5: Provisional Sums Schedule No.6: Grand Summary comprised of Schedules 1 to 5 Schedule No.7: Recommended Spare Parts Schedule No.8: Comprehensive Maintenance Service Schedule No.9: Pricing for unqualified withdrawal of Nonmaterial Nonconformities, as submitted in "Statement of Nonmaterial Nonconformities", Section IV-A, Bid Form 3.
ITB 18.5	The Bidder shall quote their prices in lump sum that is by including all kinds of tax liabilities and other associated costs. The prices for various schedules shall be quoted as under:
ITB18.5 (a)	Schedule No. 1 - Plant, to be supplied from abroad The prices shall be quoted on DDP basis (Delivery Duty Paid including cost of carriage, applicable taxes, customs duty and Insurance up to the destination) - Named place of destination is Mumbai Metro Line 3, Depot site, Mumbai, India. The scope of



	Contractor's works shall be as described in Schedule No. 1 of Pricing Document, Section IV-B.
ITB18.5 (b)	Schedule No. 2- Plant, to be supplied within the Employer's country The prices shall be quoted on FOR basis (Free on Road/Rail, including cost of carriage, applicable taxes and insurance up to destination) - Named place of destination is Mumbai Metro Line 3 depot site, Mumbai, India as described in Schedule No. 2 of Pricing Document Section IV-B.
ITB18.5 (c)	Schedule No.3 - The prices shall be quoted for Design Services as described in Schedule No.3 of Pricing Document Section IV-B.
ITB18.5 (d)	Schedule No.4 - The prices shall be quoted for Installation, Testing and Commissioning and Other Services as described in Schedule No.4 of Pricing Document Section IV-B. Named place of final destination is Mumbai Metro Line 3 depot site, Mumbai, India.
ITB18.5 (e)	Schedule No. 7 – Recommended Spares
ITB18.5 (f)	Schedule No. 8 - The prices shall be quoted for Comprehensive Maintenance Service inclusive of all taxes as described in Schedule No. 8 of Pricing Document Section IV-B.
ITB18.5 (g)	Schedule No. 9– The prices shall be quoted for unqualified withdrawal of Nonmaterial Non-conformities, as submitted in "Statement of Nonmaterial Non-conformities", Bid Form 3 , Section IV-A, Bidding Forms.
ITB 18.7	The Part A of the Contract for Plant & Installation Service (Schedule No. 1 to 4) and price of Part B (Schedule No. 8- CMS during DLP) of is a fixed price contract and not adjustable for any price variation. The price of Part B (Schedule No. 8- CMS during Post-DLP) of the Contract and prices of Spares in Schedule No.7 shall be adjustable for variation as per Appendix 2, Section IX, Contract Forms, Part 3.
ITB 19.1	The currency(ies) of the Bid shall be as follows: a) Plant and Equipment to be supplied from abroad shall be quoted in Japanese Yen (JPY) and/or USD and/or EURO and Indian Rupees (INR). b) Plant and Equipment to be supplied from within India shall be quoted in Indian Rupees (INR). c) Design, Installation, Testing & Commissioning, and Other Services shall be quoted in Japanese Yen (JPY) and/or USD and/or EURO and Indian Rupees(INR), depending upon the currency in which the costs are to be incurred. d) Comprehensive Maintenance Service in Schedule 8 shall be quoted in Japanese Yen (JPY) and/or USD and/or EURO and Indian Rupees (INR).
ITB 20.1	The Bid validity period shall be One Hundred Eighty (180) days.
ITB 20.3(a)	The Contract Price shall be adjusted by the % change in WPI, published by Economic Advisor, Ministry of Commerce & Industry, Govt of India (Commodity Code 1318000000 for "Manufacture of Machinery and Equipment") published at website



	http://eaindustry.nic.in for both foreign and local currency portion from the month in which the 56 th day after initial Bid validity falls to the month in which Contract is awarded.
ITB 21.1	The Bid Security amount shall be INR 7,00,000 (Indian Rupees Seven Lakhs only) or USD 10,000 (US Dollars Ten Thousand only) or EURO 8,750 (Euros Eight Thousand Seven Hundred and Fifty only) or JPY 1,030,000 (Japanese Yen One Million Thirty Thousand only).
ITB 21.2 (a)	Add the following at the end of 21.2 (a): The Bid Security should be in the form of a Bank Guarantee issued or confirmed by a Scheduled Commercial Bank in India.
ITB 21.2 (d)	The Bid Security shall also be accepted in the form of Demand Draft drawn in favour of MMRCL payable at Mumbai, India.
ITB 22.1	In addition to the original of the Bid, the number of copies to be submitted is two sets of hard copies and one soft/ electronic version (PDF on CD duly labelled).
ITB 22.2	The written confirmation of authorization to sign on behalf of the Bidder shall consist of the Power of Attorney and the document shall be notarized. In case of a foreign company, the document shall be Apostille or Authenticated by Indian Embassy/Consulate in that country, and shall be attached to the Bid.
D. Submission and Opening of Bids	
ITB 24.1	For <u>Bid submission purposes</u> only, the Employer's address is Attention: The Managing Director, MMRC Address: Mumbai Metro Rail Corporation Ltd, MMRC Line 3 Transit Office, Wing 'A', 'E' Block, Bandra-Kurla Complex, Bandra (East), Mumbai- 400 051, India. Telephone: +91 22 2638 4638 Facsimile number: +91 22 2659 2005 The deadline for Bid submission is: Date: 9 th April 2020 Time: 15:00 hrs.
ITB 27.1	The Technical Bid opening shall take place at: Address: Mumbai Metro Rail Corporation Ltd, MMRC Line 3 Transit Office, Wing 'A', 'E' Block, Bandra-Kurla Complex, Bandra (East), Mumbai,- 400 051, India. Date: 9 th April 2020 Time: 15:15 hrs.
E. Evaluation and Comparison of Bids	



ITB 37.1	<p>The currency to be used for Bid evaluation and comparison purposes shall be US Dollar (USD). Bid Prices expressed in various currencies in Schedule No. 6 and Schedule No. 8 will be converted to USD as per the format.</p> <p>The source of exchange rate shall be Reserve Bank of India reference rate (foreign currency). The Date for the exchange rate shall be twenty-eight (28) days prior to the date of Bid Submission.</p> <p>If the source of the exchange rate for the Bidder's proposed currency cannot be found in the Reserve Bank of India reference rate (foreign currency), then the rate in the web site www.xc.com shall be used.</p>
ITB 38.2	<p>Add item (g) to ITB 38.2</p> <p>(g) When evaluating and comparing different Bids, the Comprehensive Maintenance Services cost as quoted in Schedule No. 8 for the full period of CMS, viz 2 yrs of DLP and 5 years post-DLP (without any adjustment of price as per Appendix 2, Section IX, Part 3) in Section IV-B, Pricing Document shall be added to the Grand Summary Schedule No. 6 and shall be used for the purpose of determining the lowest bidder.</p>
Add new Sub-Clause ITB 38.6	
ITB 38.6	<p>Purchase preference to Local Supplier</p> <p>Purchase preference shall be given to local suppliers in the procurements undertaken by MMRC in the manner specified hereunder:</p> <p>The following procedure shall be followed:</p> <ol style="list-style-type: none">i. Among all qualified bids, the lowest bid will be termed as L1. If L1 is from a local supplier, the Contract will be awarded to L1.ii. If L1 is not from a local supplier, the lowest bidder among the local suppliers, will be invited to match the L1 price subject to local supplier's quoted price falling within the margin of purchase preference, and the Contract shall be awarded to such local supplier subject to matching the L1 price.iii. In case such lowest eligible local supplier fails to match the L1 price, the local supplier with the next higher bid within the margin of purchase preference shall be invited to match the L1 price and so on and Contract shall be awarded accordingly. In case none of the local suppliers within the margin of purchase preference matches the L1 price, then the Contract may be awarded to the L1 bidder.

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CONTRACT MM3-CBS-DEQ-9-02

Design, Manufacture, Supply, Installation, Testing, Commissioning
and Comprehensive Maintenance Service of
Automatic Train Wash Plant
for Project "Mumbai Metro Line-3"

Part 1

Bidding Procedure

Section III

Evaluation and Qualification Criteria

January - 2020

Mumbai Metro Rail Corporation Ltd
MMRC Line 3 Transit Office,
Wing A, Block E,
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EVALUATION AND QUALIFICATION CRITERIA

1. Evaluation

Pursuant to the criteria listed in ITB 35.1 (a) – (b) the following factors shall apply:

1.1. Technical Evaluation:

1.1.1. Personnel

The Bidder must demonstrate that it has the personnel for the key position that meet the following requirements:

Sr. No.	Position	Total Work Experience (years)	Experience in similar position held, in Works similar in scope and nature (years)
1	Eqpt Project Manager	8	4
2	Design Engineer	4	2
3	Interface Manager	4	2
4	Installation, Testing & Commissioning Manager (Site Engineer)	4	2
5	Maintenance Engineer (for CMS)	4	2

Note:

- 1) The Eqpt Project Manager shall coordinate all activities including design, manufacture, inspection, delivery, installation, testing & commissioning and maintenance of the complete Facilities & satisfactory execution of the Contract on behalf of the Contractor.
- 2) The Site Engineer shall undertake the responsibility of Installation, Testing & Commissioning activities of the Equipment under the Contract in addition to the interface requirements during these activities. He may also undertake the responsibilities of Interface Manager upon having required experience of Interface work.
- 3) The Maintenance Engineer shall co-ordinate the maintenance activities inclusive of the responsibility of arranging availability of all materials and spares required for effective comprehensive maintenance and functioning of the Equipment.

The Bidder shall provide details of the proposed personnel and their experience records in **Bid Form 1: PER.**

1.1.2. Technical Proposal

- a) The Employer will carry out a detailed technical evaluation of the Bids, in pursuant to ITB 33 and ITB 35, in order to determine whether the technical aspects of the Equipment proposed are in compliance with the Bidding Documents. The Employer will evaluate the technical suitability and acceptability of Bidder's Technical Proposal as per Employer's Requirements-General Specification and Technical Specification.
- b) Bidder shall furnish their Technical Proposal of the Equipment according to **Bid Form 2, Section IV-A, Part 1** and furnish all the attachments. Proposal shall be clear and concise in order to fully enable MMRC to evaluate compliance with the functional and other requirements, specified in the Employer's Requirements, Part 2.



- c) For the avoidance of doubt, any review, evaluation and acceptance by the Employer of a technical proposal shall not relieve the awarded Bidder from its obligations, undertakings under the Contract, Bidder's understanding of scope of work and interfacing with other Contractors.
- d) Bidder shall give their comments only against those Clauses where they wish to give any deviations, non-compliance, clarifications, remarks etc. The clauses against which no remarks are offered shall be deemed to have been committed by the Bidder as 'Complied'.

1.1.3. Others

1.1.3.1 Project Implementation Plan

The Bidder shall submit a Project Implementation Plan, incorporating stage-wise activities, viz. Design, Manufacturing, Testing including FAT, delivery at Site, and Installation, Testing & Commissioning at site as per the Employer's Requirements in **Bid Form 4**, Section IV-A, Part 1 indicating minimum time required for each stage of the project. The Bidder shall take into consideration the Key dates requirements contained in Appendix 1, Section VI-A, General Specifications and confirm compliance to these key dates.

1.1.3.2 The Bidder shall submit the details of the Certificate of Compliance.

- i) Certificate of Compliance provided in **Bid Form 8**, Section IV-A, Part 1.
- ii) Interface Requirement Undertaking in **Bid Form 9**, Section IV-A, Part 1.

1.1.4. Bidder's declaration of the adequacy of the bid document

The Bidding Documents do not purport to contain all relevant information in relation to the Contractor's activities or the works, and are provided solely on the basis that a Bidder will be responsible for making its own assessment of the matters referred to in the Bid Documents. The Bidder is responsible for reviewing the Bid Documents (including all addenda) provided by the Employer to ensure that it has a complete copy of all documents.

Bidder shall submit the following Certificates along with the Bid:

- i) Form of Certificate confirming careful examination of all the Contents of Bidding Documents and signing of all pages of Bidder's Proposal in **Bid Form 6**, Section IV-A, Part 1.
- ii) Form of Certificate confirming receipt of all Bid Addenda in **Bid Form 7**, Section IV-A, Part 1

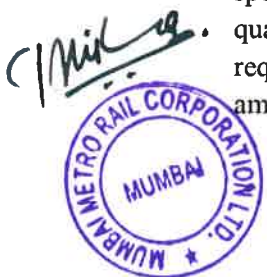
1.2. Economic Evaluation

In addition to the criteria listed in ITB 38.2 (a) – (e) the following criteria shall apply.

1.2.1. Quantifiable Nonmaterial Nonconformities

Pursuant to ITB 34.3 and ITB 38.2 (d), the cost of all quantifiable non-material nonconformities as submitted in Schedule No 9, Section IV-B, Pricing Document, Part 1, shall be considered for fair comparison of Bids.

In case any Bidder quotes apportioned price for Schedule No. 3 more than the maximum specified and for Schedule No. 4 less than the minimum specified, it will be treated as quantifiable Nonmaterial Nonconformity in accordance with ITB 38.2 (d), as it shall require faster stream of payment than specified. In such a case, the interest implication amount on early payment shall be added to the Bid Price for the purpose of comparison



amongst Bidders for determination of the lowest evaluated Bid. The rate of annual interest for this purpose shall be 3 percentage points above the repo rate of RBI as on Base Date.

1.2.2. Other Factors

The following factors and methods will apply under ITB 38.2 (f):

(a) Time Schedule:

Time to complete the Plant and Installation Services from the effective date specified in Article 3 of the Contract Agreement (CF 2, Section IX, Part 3) for determining time for completion of all activities is as per the Key Dates specified in Appendix 1, Section VI-A, General Requirements, Part 2.

(b) Operating and Maintenance Costs:

When evaluating and comparing different Bids, for the determination of the lowest evaluated Bidder, the Comprehensive Maintenance Service price, for the whole of the period specified in Clause 4, Section VI-B, Part 2 and calculated according to the price quoted in Schedule No. 8, Pricing Document, Section IV-B without any adjustment shall be added to the Grand Summary Schedule No. 6.

(c) Purchase preference to Local Suppliers:

The purchase preference to Local Suppliers shall be governed as per the provisions given in Part 1, Section 2, ITB Clause 14.2 and 38.6.

2. Qualification

(i) Exchange Rate for Qualification Criteria

Wherever a Form in Section IV-A, Bidding Forms, requires a Bidder to state a monetary amount, Bidders shall indicate the USD equivalent using the rate of exchange determined as follows:

- a) For turnover or financial data required for each year - Exchange rate prevailing on the last working day of the respective calendar year shall be taken in to consideration. For the countries where the financial year is ending on 31st December and for the countries where the financial year is ending on 31st March, the Exchange rate prevailing on the last working day of the respective calendar year shall be taken for this purpose.
- b) Value of single Contract - Exchange rate prevailing on the date of the Contract.
Exchange rates shall be taken from the publicly available source **identified in BDS 37.1.**

(ii) Qualification Criteria for Multiple Contracts

Not Applicable.



Eligibility and Qualification Criteria		Compliance Requirements			Documentation	
Factor	Requirement	Single Entity	Joint Venture (existing or intended)		Submission Requirements	
			All Parties Combined	Each Member		One Member
2.1 Eligibility						
2.1.1	Nationality in accordance with ITB 4.3	Must meet requirement	N/A	Must meet requirement	N/A	Bid Form 10: ELI- 1 and Bid Form 11: ELI- 2, with attachments
2.1.2	No conflicts of interest in ITB 4.2	Must meet requirement	N/A	Must meet requirement	N/A	Letter of Technical Bid
2.1.3	JICA Ineligibility Not having been declared ineligible by JICA, as described in ITB Sub-Clause 4.4	Must meet requirement	N/A	Must meet requirement	N/A	Form ACK



Eligibility and Qualification Criteria		Compliance Requirements			Documentation		
Factor	Requirement	Single Entity	Joint Venture (existing or intended)		Submission Requirements		
			All Parties Combined	Each Member		One Member	
2.2 Historical Contract Non-Performance							
2.2.1	History of Non-Performing Contracts	Non-performance of a Contract ⁽ⁱ⁾ did not occur as a result of Contractor's default since 1 st January 2014.	Must meet requirement ⁽ⁱⁱ⁾	N/A	Must meet requirement ⁽ⁱⁱ⁾	N/A	Bid Form 12: CON
2.2.2	Pending Litigation	All pending litigation shall in total not represent more than Fifty percent (50 %) of the Bidder's net worth and shall be treated as resolved against the Bidder.	Must meet requirement ⁽ⁱⁱ⁾	N/A	Must meet requirement ⁽ⁱⁱ⁾	N/A	Bid Form 12: CON
2.2.3	Litigation History	No consistent history of court/arbitral award decisions against the Applicant ⁽ⁱⁱⁱ⁾ since 1st January 2014.	Must meet requirement ⁽ⁱⁱ⁾	N/A	Must meet requirement ⁽ⁱⁱ⁾	N/A	Bid Form 12: CON
Notes for the Bidder:							
(i) Non-performance, as decided by the Employer, shall include all Contracts							
a) where non-performance was not challenged by the Contractor, including through referral to the dispute resolution mechanism under the respective Contract, and							
b) that were so challenged but fully settled against the Contractor.							
Non-performance shall not include Contracts where Employers decision was overruled by the dispute resolution mechanism. Non-performance must be based on all information on fully settled disputes or litigation, i.e. dispute or litigation that has been resolved in accordance with the							



Eligibility and Qualification Criteria		Compliance Requirements			Documentation
No.	Factor	Requirement	Joint Venture (existing or intended)		Submission Requirements
			All Parties Combined	Each Member	
			dispute resolution mechanism under the respective Contract and where all appeal instances available to the Applicant have been exhausted. (ii) This requirement also applies to Contracts executed by the Bidder as a JV member. (iii) The Bidder shall provide accurate information on the related Bidding Form about any litigation or arbitration resulting from Contracts completed or ongoing under its execution since 1 st January 2014. A consistent history of awards against the Bidder or any member of a joint venture may result in rejection of the Bid.		



Eligibility and Qualification Criteria		Compliance Requirements			Documentation		
No.	Factor/ Sub-Factor	Requirement	Single Entity	Joint Venture (existing or intended)		Submission Requirements	
			All Parties Combined	Each Member	One Member		
2.3 Financial Situation							
2.3.1	Financial Performance	The audited balance sheets or, if not required by the laws of the Bidder's country, other financial statements acceptable to the Employer, for the last 5 years ending 31 st March 2019 for the countries where the financial year ending on 31 st March, or for the last 5 years ending 31 st December 2018 for the countries where the financial year ending on 31 st December shall be submitted. As the minimum requirement, an Bidder's net worth calculated as the difference between total assets and total liabilities shall be positive for the last financial year during the above period.	Must meet requirement	N/A	Must meet requirement	N/A	Bid Form 13: FIN-1 with attachments
2.3.2	Average Annual Turnover	Minimum average annual turnover (calculated as total certified payments received for Contracts in progress and/ or completed) as a prime Contractor over	Must meet requirement	Must meet requirement	Must meet 25% of the requirement	Must meet 40% of the requirement	Bid Form14: FIN-2



Eligibility and Qualification Criteria		Compliance Requirements			Documentation
Factor/ Sub-Factor	Requirement	Single Entity	Joint Venture (existing or intended)		Submission Requirements
No.			All Parties Combined	Each Member	
2.3 Financial Situation					
	<p>the last 5 financial years i.e. turnover values between April 1, 2014 to March 31, 2019 for the countries where the financial year is ending on 31st March or between January'1, 2014 to December'31, 2018 for the countries where the financial year is ending on 31st December must be USD 2.4 million or the equivalent thereof</p> <p>Note: To bring the Contract values at par, the annual turnover values will be calculated by assuming 5% escalation per annum for Indian Currency and 2% escalation per annum for foreign currency for the first 4 years of the above turnover values and total value of 5 years divided by 5.</p>				



Eligibility and Qualification Criteria		Compliance Requirements			Documentation		
No.	Factor/ Sub-Factor	Requirement	Single Entity	Joint Venture (existing or intended) All Parties Combined	Each Member	One Member	Submission Requirements
2.3 Financial Situation							
2.3.3	Financial Resources	i) The Bidder shall demonstrate that it has access to, or has available, liquid assets, lines of credit, and other financial means (independent of any Contractual advance payment) sufficient to meet the cash flow requirements of USD 360,000 or the equivalent thereof for the subject Contract net of the Bidder's other commitments. ii) The Bidder shall also demonstrate, to the satisfaction of the Employer, that it has adequate sources of finance to meet 25% of the total commitments on works currently in progress on the date of Bid submission.	Must meet requirement	Must meet requirement	Must meet 15% of the requirement	Must meet 50% of the requirement	Bid Form 15 FIR-1 and Bid Form 16 FIR-2



Eligibility and Qualification Criteria		Compliance Requirements			Documentation	
No.	Factor/ Sub-Factor	Requirement	Single Entity	Joint Venture (existing or intended)		Submission Requirements
				All Parties Combined	Each Member	
2.4 Experience						
		<p>Plant shall have been completed outside the country of manufacture of the Wash Plant or in India.</p> <p>A minimum two (02) number of similar Wash Plant commissioned in the last seven (07) years, viz. from 1st January 2013 shall be in operation in Metro/Railway/MRT systems including at least one (01) number with provision of Front & Rear wash arrangement with satisfactory performance for a minimum period of 2 years after commissioning and supported by a performance certificate from the end-client. The performance certificate shall not be of issue date more than 2 years from the Bid submission date.</p>				





Eligibility and Qualification Criteria		Compliance Requirements			Documentation
No.	Factor/ Sub-Factor	Requirement	Joint Venture (existing or intended)		Submission Requirements
			Single Entity	All Parties Combined	
2.4 Experience					
Notes for the Bidder:					
(i) The similarity shall be as "All supplies of Automatic Train Wash Plant for Washing of Metro cars, MRT trains, Railway trains of at least 3-car length. (ii) Substantial completion shall be based on 80% or more works completed under the Contract. (iii) For Contracts under which the Bidder participated as a JV member, only the Bidder's share, by value, shall be considered to meet this requirement. (iv) In case of a JV, the value of Contracts completed by its members shall not be aggregated to determine whether the requirement of the minimum value of a single Contract has been met. Instead, each Contract performed by each member shall satisfy the minimum value of a single Contract as required for single entity. In determining whether the JV meets the requirement of total number of Contracts, only the number of Contracts completed by all members each of value equal or more than the minimum value required shall be aggregated.					

2.5 Bid Capacity

The Bidders will be qualified only if their available bid capacity is more than the approximate cost of the work. The available bid capacity shall be more than

USD 500,000 and will be calculated as under;

Available Bid Capacity = $2 * A * N - B$.

Where,

A = Maximum value of Supplies of all equipment manufactured in any one year during the last five financial years starting from 1st January 2014 for the countries where the financial year ending on 31st December and 1st April 2014, for the countries where the financial year ending on 31st March (value of supplies of all equipment manufactured will be updated to 31st March 2019, by assuming 5% escalation for Local Currency portion per year and 2% escalation for Foreign Currency portion per year). The value of Supplies executed shall be converted to USD using RBI's exchange rate shown on their website on the last day of the respective financial year. If the exchange rate cannot be found on RBI's website, then it shall be obtained from www.xe.com.

N = No. of years taken as 1.5.

B = Value of existing commitments for ongoing Supplies of Equipment (During period of completion of work under this bid).

In the case of a consortium/JV, the above formula will be applied to each member to the extent of his percentage share in the execution of facilities under this Bid. The Bidder shall fill in the **Bid Form 17: Bid Capacity** to establish his Bid capacity. However, it would suffice if any one member satisfies the bid capacity criteria to the full on its own.

Bidders, which do not qualify bid capacity criteria, shall not be considered for further evaluation and their bids shall be rejected.

Note:

- (a) Value of Supplies of all Equipment for the last five financial years has to be taken from **Bid Form 14 FIN-2: Average Annual Turnover**.
- (b) Value of existing commitments for on-going Equipment Manufacturing during period of completion of facilities under this bid has to be submitted by the Bidder in **Bid Form 16 FIR-2: Current Contract Commitments**. These data shall be certified by the chartered accountant/statutory auditor with his stamp and signature.



2.6 Subcontractors/ agencies

2.6.1 Subcontractors/ agencies for the Installation, Testing & Commissioning work and Maintenance services during CMS must meet the following minimum criteria:

- (a) The subcontractors/agencies for the services, referred in Clause 2.6.1 above must have a cumulative experience of minimum two (02) years in the respective item of service.
- (b) The subcontractors/agencies for the Installation, Testing & Commissioning work must have completed at least one (01) Contract of similar Equipment in last five (05) years.
- (c) The subcontractors/agencies for the Maintenance work must have experience of providing CMS/AMC on at least one (01) similar Equipment over a period of one (01) year in last five (05) years. Alternatively, the Contractor shall provide adequately trained manpower for the CMS work.

2.6.2 The Bidder shall submit the details of proposed Sub-contractors/ agencies for the services, referred in Clause 2.6.1 above in **Bid Form 22: SUB-Contractors**.

----- End -----



BIDDING DOCUMENTS



MUMBAI METRO LINE 3 (COLABA-BANDRA-SEEPZ)

CONTRACT MM3-CBS-DEQ-9-02

Design, Manufacture, Supply, Installation, Testing, Commissioning
and Comprehensive Maintenance Service of
Automatic Train Wash Plant
for Project "Mumbai Metro Line-3"

Part 1 Bidding Procedures

Section IV-A Bidding Forms

January – 2020

**Mumbai Metro Rail Corporation Ltd
MMRC Line 3 Transit Office,
Wing A, Block E,
Bandra-Kurla Complex,
Bandra (East), Mumbai- 400 051, India.**



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Bidding Documents

Composition of Documents

Part 1	Bidding Procedures
Section I	Instructions to Bidders
Section II	Bid Data Sheet
Section III	Evaluation and Qualification Criteria
Section IV-A	Bidding Forms
Section IV-B	Pricing Document
Section V	Eligible Source Countries of Japanese ODA Loans
Part 2	Employer's Requirements
Section VI-A	Employer's Requirements - General Specifications
Section VI-B	Employer's Requirements - Technical Specifications
Part 3	Conditions of Contract and Contract Forms
Section VII	General Conditions of Contract (GCC)
Section VIII	Particular Conditions of Contract (PCC)
Section IX	Contract Forms
Section X	Special Conditions for Comprehensive Maintenance Service Contract
Part 4	Drawings
Section XI	Drawings



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BIDDING FORMS TABLE OF CONTENTS

Letter of Technical Bid	1
Letter of Price Bid	2
Bid Form 1: Form PER: Proposed Personnel	3
Bid Form 2: Bidder's Technical Proposal of Equipment	4
Bid Form 3: Statement of Nonmaterial Nonconformities	6
Bid Form 4: Project Implementation Plan	7
Bid Form 5: Structure of the Bidder	8
Bid Form 6: Form of Certificate Confirming Careful Examination	9
Bid Form 7: Form of Certificate confirming receipt of all Bid Addenda	10
Bid Form 8: Certificate of Compliance	11
Bid Form 9: Interface Requirement Undertaking	12
Bid Form 10 ELI-1: Bidder Information	13
Bid Form 11 ELI-2: Bidder's Party Information	14
Bid Form 12 CON: Historical Contract Non-Performance	15
Bid Form 13 FIN-1: Financial Situation	18
Bid Form 14 FIN-2: Average Annual Turnover	19
Bid Form 15 FIR-1: Financial Resources	20
Bid Form 16 FIR-2: Current Contract Commitments	21
Bid Form 17: Bid Capacity	22
Bid Form 18: Form EXP - 1: General Experience	23
Bid Form 19: Form EXP - 2: Specific Experience	24
Bid Form 20: Certification of Minimum Local Content for availing Purchase Preference	26
Bid Form 21 MAN: Manufacturer's Authorization	27
Bid Form 22: SUB-Contractors	28
Form ACK: Acknowledgement of Compliance with the Guidelines for Procurement under Japanese ODA Loans	29
Form DBR	31
Form of Bid Security (Bank Guarantee)	32



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Letter of Technical Bid

Date: *[insert date of Bid submission]*
Loan Agreement No.: ID-P268
IFB No.: MM3-CBS-DEQ-9-02

To: **Mumbai Metro Rail Corporation Ltd.**

We, the undersigned, declare that:

- (a) We have examined and have no reservations to the Bidding Documents, including Addenda issued in accordance with Instructions to Bidders (ITB 8): *[insert the number and issuing date of each Addendum]*;
- (b) We, including any Sub-Contractors/ manufacturers, for any part of the Contract, meet the eligibility requirements in accordance with ITB 4 and ITB 5;
- (c) We, including any Sub-Contractors/ manufacturers, for any part of the Contract, have no conflict of interest in accordance with ITB 4;
- (d) We offer to Design, Manufacture, Supply, Installation, Testing & Commission and Comprehensive Maintenance Service in conformity with the Bidding Documents, of “Automatic Train Wash Plant”.
- (e) Our Bid shall be valid for a period of **180** days from the date fixed for the Bid submission deadline in accordance with the Bidding Documents, and it shall remain binding upon us and may be accepted at any time before the expiration of that period;
- (f) We are not participating, as a Bidder or as a Sub-Contractor/ manufacturer, in more than one Bid in this Bidding process in accordance with ITB 4.2 (c).
- (g) We hereby certify that we have taken steps to ensure that no person acting for us or on our behalf will engage in any type of fraud and corruption.

Name of the Bidder**[insert complete name of the Bidder]*

Name of the person duly authorized to sign the Bid on behalf of the Bidder** *[insert complete name of person duly authorized to sign the Bid]*

Title of the person signing the Bid *[insert complete title of the person signing the Bid]*

Signature of the person named above *[insert signature of person whose name and capacity are shown above]*

Date signed *[insert date of signing]* day of *[insert month]*, *[insert year]*

*: In the case of the Bid submitted by a Joint Venture specify the name of the Joint Venture as Bidder.

** : Person signing the Bid shall have the power of attorney given by the Bidder to be attached with the Bid.



Letter of Price Bid

(To be submitted along with Price Bid)

Date: *[insert date of Bid submission]*

Loan Agreement No.: ID-P268

IFB No.: MM3-CBS-DEQ-9-02

To: **Mumbai Metro Rail Corporation Ltd.**

We, the undersigned, declare that:

- (a) We have examined and have no reservations to the Bidding Documents, including Addenda issued in accordance with Instructions to Bidders (ITB 8): *[insert the number and issuing date of each Addendum]*;

We offer to Design, Manufacture, Supply, Installation, Testing & Commission and Comprehensive Maintenance Service in conformity with the Bidding Documents, of "Automatic Train Wash Plant"

- (b) The total price of our Bid, excluding any discounts offered in item (c) below is:
Part A of the Contract (from Schedule No. 6):
Part B of the Contract (from Schedule No. 8):
[indicate the various amounts (in words and figures) and the respective currencies from the respective Schedules]
- (c) The discounts offered and the methodology for their application are:
The discounts offered are: *[specify in detail each discount offered]*
The exact method of calculations to determine the net price after application of discounts is shown below: *[specify in detail the method that shall be used to apply the discounts]*;
- (d) Our Bid shall be valid for a period of **180 days** from the date fixed for the Bid submission deadline in accordance with the Bidding Documents, and it shall remain binding upon us and may be accepted at any time before the expiration of that period;
- (e) If our Bid is accepted, we commit to obtain a Performance Security in accordance with the Bidding Documents;
- (f) We understand that this Bid, together with your written acceptance thereof included in your Letter of Acceptance, shall constitute a binding Contract between us, until a formal Contract is prepared and executed; and
- (g) We understand that you are not bound to accept the lowest evaluated Bid or any other Bid that you may receive.

Name of the Bidder**[insert complete name of the Bidder]*

Name of the person duly authorized to sign the Bid on behalf of the Bidder** *[insert complete name of person duly authorized to sign the Bid]*

Title of the person signing the Bid *[insert complete title of the person signing the Bid]*

Signature of the person named above *[insert signature of person whose name and capacity are shown above]*

Date signed *[insert date of signing]* day of *[insert month]*, *[insert year]*

*: In the case of the Bid submitted by a Joint Venture/ Consortium, specify the name of the Joint Venture/ Consortium as Bidder.

** Person signing the Bid shall have the power of attorney given by the Bidder to be attached with



Bid Form 1: Form PER: Proposed Personnel

Date: [inset day, month, year]

Bidder's Legal Name: [insert full name], or

Joint Venture Party Legal Name: [insert full name]

IFB No.: MM3-CBS-DEQ-9-02

The Bidder shall provide the details of suitably qualified personnel for each of the personnel listed in Part 1 - Bidding Procedure Section III - Evaluation and Qualification Criteria Clause 1.1.1, to meet the specified requirements stated therein.

1. Title of Position* _____.
2. Name _____.
3. Job Title _____.
4. Name of Employer _____.
5. Summary of last 10 years professional experience:

From (mm-yyyy)	To (mm-yyyy)	Company	Relevant work experience



Bid Form 2: Bidder's Technical Proposal of Equipment

The following is the minimum documentation that shall be supplied by the Bidder to enable technical evaluation of the Bid. The Bidder shall include any further information necessary to demonstrate the suitability of his proposal.

The Bidder shall provide the following information:

A. Technical Details of offered Equipment	
A1	A detailed technical note including description of the equipment and all major assemblies must be given.
A2	Sufficient details with drawings to make a reasonable assessment of: i. The equipment as a whole ii. The Working System and sub system.
A3	A list of major subassemblies accompanied with brief technical description.
A4	Bidder shall also detail Comprehensive Maintenance Service of the Equipment with particulars of Condition Based Maintenance of any specific equipment of the Wash Plant
A5	Time required for washing an 8-car train (side walls, front and rear wash) and the desirable speed of travel.
B. General	
B1	Details of limitations, deviations with respect to Employer's Requirements, as also listed in Bid Form 3, shall be submitted. Deviations and non-compliance of the offered equipment and cost implications thereof, if any, shall be given in respective Statement in the Pricing Document.
B2	Details of inspections, FAT, Delivery, Installation, Testing and Commissioning of Wash Plant giving estimated time for each activity.
B3	Details of interfacing and final integration of equipment with relevant Interfacing Contractors. The Bidder shall give details of System Support Requirements (Interface requirements), e.g. requirements of power, water supply, compressed air, civil structures, flooring, cable ducts, trenches, lighting, environment, fire safety, etc. whichever is applicable.
C. Spare Parts, Special tools, Test Equipment & Maintenance Facilities	
C1	List of consumables and regular wear spare parts with tentative life.
C2	Bidder shall give the details of the local agency, if applicable, for Installation, Testing & Commissioning work as under: Company Profile: Experience details: Number of similar equipment Installed in the past.



C3	For firms, out of Mumbai, the details of the local agency, if applicable, for CMS work as under: Company Profile: Maintenance facilities: Number of years maintaining similar equipment.
D. Bidder's Organisation	
D1	The Bidder shall submit the organization chart indicating the key persons responsible for different functions, viz. Design, Manufacturing, Quality, Installation, Testing & Commissioning etc.

Note: It is stated that the technical details at the Bidding stage may be subject to minor change, during the design development process.

Bidder Company Name:

Bidder's Representative Name:

Signature:

Date of Submission:

Company Seal:



Bid Form 3: Statement of Nonmaterial Nonconformities

Reference: Part 1 - Bidding Procedure Section III - Evaluation and Qualification Criteria, Clause 1.1.2 (d),

[Bidder shall list the items of nonmaterial nonconformities (if any) below.]

Clause Number	Details of Nonmaterial Nonconformities	Remarks explaining reasons for Nonmaterial Nonconformities and why it may be considered by the Employer

1. We hereby confirm that all implicit and explicit nonconformities, i.e. deviations, omissions, comments and remarks found elsewhere in our proposal shall be treated as NULL and VOID and stand withdrawn.
2. We hereby confirm that except for the nonconformities noted in this Bid Form 3, our offer is fully and truly compliant.
3. **All nonconformities have been listed in this Bid form 3 and priced in Schedule No. 9, Section IV-B, Part 1.** Nonconformities not priced will be treated as null and void and stand withdrawn at nil price.

Note:

Where there is no Nonconformity, the statement shall be returned duly signed with an endorsement indicating 'No Nonconformity'. In case, Performa of nonconformities is not submitted or submitted as blank, it will be construed that the Bidder has not proposed any nonconformity from Bidding Documents and will provide all Equipment as per specifications and Bidding Documents.

Bidder Company Name: _____

Bidder's Representative Name: _____

Signature: _____

Date of Submission: _____

Company Seal: _____



Bid Form 4: Project Implementation Plan

[The Bidder shall provide Project Implementation Plan as described in Part 1 - Bidding Procedure Section III - Evaluation and Qualification Criteria Clause no 1.1.3.1]

The Bidder shall indicate the timeline planning of the different activities of Part A of the Project giving the minimum time required for each activity and sub-activities ensuring compliance with Key dates as per Appendix 1, Section VI-A, Part 2.

Bidder Company Name:

Bidder's Representative Name:

Signature:

Date of Submission:

Company Seal



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Bid Form 5: Structure of the Bidder
(Refer Clause 11.2 (e) of Section I, ITB, Part 1)

The Bidder shall supply a chart particularizing the structure of the Bidder (identifying all companies comprising the Bidder in the event that the Bidder is a joint venture or consortium) and the ownership of each of the companies comprising the Bidder, identifying all respective intermediate and ultimate holding companies.

Composition of the Bidder

1. A notarized copy of Memorandum of Understanding (MOU) relating to the composition of the Bidder shall be submitted. For guidance, if the Bidder is a joint venture or a consortium then the joint venture or consortium agreement is to be submitted by the Bidder. If the Bidder is an entity established or to be established for this Contract, details of the shareholders' agreement or proposed shareholders' agreement shall be supplied together with the percentage participation and percentage equity in the agreements.
2. The Contractual arrangements and copies of agreements in relation thereto must, as a minimum, provide information on all members or participants involved, their respective participation in the Bid, the management structure, ownership and control of the members or participants comprising the Bidder and if, appropriate, the name of the member or participant who would have overall lead management responsibility for the Works, the registered addresses of all parties and the names of their respective senior partners, chairmen or managing directors as appropriate. Such agreements shall also reflect the joint and several liabilities of the members to the Employer in the event that the Contract is awarded to them and provide "deadlock" provisions in the event that decisions of the joint venture or consortium cannot be reached by unanimous agreement.
3. The Bidder shall furnish the details, in the agreement, of the scope split of facilities amongst the Consortium/Joint Venture members.
4. The Bidder shall provide written confirmation that:
 - a) The agreement or agreements submitted represent the entire agreement between the members or participants comprising the Bidder as to the Bidder's legal persona;
 - b) There is or are no other agreements relating to the Bidder's incorporation, powers or organization which may affect in any way his ability to carry out the Facilities; and
 - c) No changes will be made to any such agreements during the tender period or during the Contract period (if Contract awarded) without first obtaining the Employer's agreement to the proposed change or changes.

Bidder Company Name: _____

Bidder's Representative Name: _____

Signature: _____

Date of Submission: _____



Company Seal

**Bid Form 6: Form of Certificate Confirming Careful Examination
of all the Contents of Bidding Documents and signing of
all Pages of Bidder's Proposal**

This is to certify that we, M/s -----[*Name of the company] ----- have carefully examined all the contents of the Bidding Documents including Bid Addenda (if any) and all the pages of our proposal have been signed and stamped (by each constituent member in case of a joint venture or consortium).

Bidder Company Name:

Bidder's Representative Name:

Signature:

Date of Submission:

Company Seal



Bid Form 7: Form of Certificate confirming receipt of all Bid Addenda

This is to certify that we, M/s [* Name of the Bidder's company] have received all Bid Addenda to Bid "MM3-CBS-DEQ-9-02", as listed below:

1. Addendum No.
2.
3.
4.
-
-
-

Bidder Company Name:

Bidder's Representative Name:

Signature:

Date of Submission:

Company Seal



Bid Form 8: Certificate of Compliance

This Certificate is issued in the full knowledge that the Technical Proposals submitted by us, are in Clause-by-Clause Compliance with the Employer's Requirements and other specifications, including Addenda thereon, except as noted in **Bid Form 3: Statement of Nonmaterial Deviations** accompanying this Certificate.

Bidder Company Name:

Bidder's Representative Name:

Signature:

Date of Submission:

Company Seal



Bid Form 9: Interface Requirement Undertaking

We hereby confirm that our offer is fully compliant with the interfacing requirement with other Interfacing Contractors/ Authorities/ Systems.

Bidder Company Name:

Bidder's Representative Name:

Signature:

Date of Submission:

Company Seal



Bid Form 10 ELI-1: Bidder Information

Date: [insert day, month, year]

IFB No.: MM3-CBS-DEQ-9-02

Page [insert page number] of [insert total number] pages

[The Bidder shall provide the following information]

1. Bidder's legal name: [Insert full name] -----.
2. In case of JV/ Consortium, legal name of the representative member and of each member: [Insert full name of each member in the JV and specify the representative member] -----
3. Bidder's actual or intended country of registration: [insert country of registration]
4. Bidder's actual or intended year of incorporation: [insert year of incorporation]
5. Bidder's legal address in country of registration: [insert street/number/town or city/country]
6. Bidder's authorized representative information Name: [insert full name] Address: [insert street/number/town or city/country] Telephone/Fax numbers: [insert telephone/fax numbers, including country and city codes] Email Address: [insert E-mail address]
7. Attached are copies of original documents of: <input type="checkbox"/> Articles of Incorporation (or equivalent documents of constitution or association), and/or documents of registration of legal entity named above, in accordance with ITB 4.3. <input type="checkbox"/> In case of JV, letter of intent to form JV or JV agreement, in accordance with ITB 4.1.
8. Included are the organizational chart, a list of Board of Directors, and the beneficial ownership.

Company Seal



Bid Form 11 ELI-2: Bidder's Party Information

Date: [insert day, month, year]

IFB No.: MM3-CBS-DEQ-9-02

Page [insert page number] of [insert total number] pages

[The following form is additional to 'Bid Form10 ELI-1' and shall be completed to provide information relating to each JV member (in case the Bidder is a JV)/ Sub contractor proposed to be used by the Bidder for any part of the Contract.]

1. Bidder's legal name: [insert full name] -----
2. Bidder's Party legal name registered with the government: [Insert full name of Bidder's Party] -----
3. Bidder's Party country of registration: [insert country of registration] -----
4. Bidder's Party year of incorporation: [insert year of incorporation] -----
5. Bidder's Party legal address in country of registration: [insert street/number/town or city/country] -----
6. Bidder's Party authorized representative information Name: [insert full name] ----- Address: [insert street/number/town or city/country] ----- Telephone/Fax numbers: [insert telephone/fax numbers, including country and city codes] ----- E-mail address: [insert E-mail address] -----
7. Attached are copies of original documents of <input type="checkbox"/> Articles of Incorporation (or equivalent documents of constitution or association), and/or registration documents of the legal entity named above, in accordance with ITB 4.3.
8. Included are the organizational chart, a list of Board of Directors, and the beneficial ownership.

Signature & Company Seal



Bid Form 12 CON: Historical Contract Non-Performance

[The following table shall be filled in for the Bidder and for each member of a JV.]

Date: [insert day, month, year]

Bidder's Legal Name: [insert full name]

Joint Venture Party Legal Name: [insert full name]

IFB No.: MM3-CBS-DEQ-9-02

Page [insert page number] of [insert total number] pages

1. History of Non-Performing Contracts

Non-Performing Contracts			
<input type="checkbox"/> Contract non-performance did not occur since 1 st January 2015, in accordance with the Section III, Evaluation and Qualification Criteria, Sub-Factor 2.2.1, as appropriate.			
<input type="checkbox"/> Contract(s) not performed since 1 st January 2015, in accordance with the Section III, Evaluation and Qualification Criteria, Sub-Factor 2.2.1, as appropriate, is(are) indicated below:			
Year	Non- performed portion of Contract	Contract Identification	Total Contract Amount (current value, currency, exchange rate and USD equivalent)
[insert year]	[insert amount and percentage]	<ul style="list-style-type: none"> Contract Identification: [indicate complete Contract name, number, and any other identification] Name of Employer: [insert full name] Address of Employer: [insert street/city/country] Reason(s) for non-performance: [indicate main reason(s)] 	[insert amount]



2. Pending Litigation

Pending Litigation				
<input type="checkbox"/> No pending litigation in accordance with the Part 1, Section III, Evaluation and Qualification Criteria, Sub-Factor 2.2.2, as appropriate. <input type="checkbox"/> Pending litigation in accordance with the Part 1, Section III, Evaluation and Qualification Criteria, Sub-Factor 2.2.2, as appropriate, is indicated below.				
Year of dispute	Amount in dispute (currency)	Outcome as Percentage of Net Worth	Contract Identification	Total Contract Amount (current value, currency, exchange rate and USD equivalent)
[insert year]	[insert amount]	[insert percentage]	<ul style="list-style-type: none"> Contract Identification: [indicate complete Contract name, number, and any other identification] Name of Employer: [insert full name] Address of Employer: [insert street/ city/ country] Matter in dispute: [indicate main issues in dispute] Status of dispute: [indicate if it is being treated by the Adjudicator, under Arbitration or being dealt with by the Judiciary] 	[insert amount]



3. Litigation History

Litigation History		
<input type="checkbox"/> No court/arbitral award decisions against the Bidder since 1 st January 2015, in accordance with the Section III, Evaluation and Qualification Criteria, Sub-Factor 2.2.3, as appropriate.		
<input type="checkbox"/> Court/arbitral award decisions against the Bidder since 1 st January 2015, in accordance with the Section III, Evaluation and Qualification Criteria, Sub-Factor 2.2.3, as appropriate, are indicated below:		
Year of award	Contract Identification	Total Contract Amount (current value, currency, exchange rate and USD equivalent)
[insert year]	<ul style="list-style-type: none"> • Contract Identification: [indicate complete Contract name, number, and any other identification] • Name of Employer: [insert full name] • Address of Employer: [insert street/city/country] • Matter in dispute: [indicate main issues in dispute] • Party who initiated the dispute: [indicate "Employer" or "Contractor"] • Status of dispute: [indicate if it is being treated by the Adjudicator, under Arbitration or being dealt with by the Judiciary] 	[insert amount]

Signature & Company Seal

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Bid Form 13 FIN-1: Financial Situation

[The following table shall be filled in for the Bidder and for each member of a JV/ Consortium.]

Date: [insert day, month, year]

Bidder's Legal Name: [insert full name]

Joint Venture Party Legal Name: [insert full name]

IFB No.: MM3-CBS-DEQ-9-02

Page [insert page number] of [insert total number] pages

1. Financial data

Type of Financial information in (currency)	Historic information for previous five (5) years (amount, currency, exchange rate, USD equivalent)				
	Year 1	Year 2	Year 3	Year 4	Year 5
Statement of Financial Position (Information from Balance Sheet)					
Total Assets (TA)					
Total Liabilities (TL)					
Net Worth (NW)					
Curent Assets (CA)					
Curent Liabilities (CL)					
Information from Income Statement					
Total Revenue (TR)					
Profits Before Taxes (PBT)					
Profits After Taxes (PAT)					

2. Financial documents

The Bidder and its Parties shall provide audited/ CA certified copies of the financial statements for 5 years pursuant to the Section III, Evaluation and Qualifications Criteria, Sub-factor 2.3.1. The financial statements shall:

- (a) reflect the financial situation of the Bidder or in case of JV/ Consortium member, of each member, and not an affiliated entity (such as parent company or group member).
- (b) be independently audited or certified in accordance with local legislation.
- (c) be complete, including all notes to the financial statements.
- (d) correspond to accounting periods already completed and audited.

Attached are copies of financial statements for the 5 years required above; and complying with the requirements.

Signature & Company Seal



Bid Form 14 FIN-2: Average Annual Turnover

[The following table shall be filled in for the Bidder and for each member of a JV.]

Date: [insert day, month, year]

Bidder's Legal Name: [insert full name]

Joint Venture Party Legal Name: [insert full name]

IFB No.: MM3-CBS-DEQ-9-02

Page [insert page number] of [insert total number] pages

Annual Turnover Data (Supplies of all equipment) as a Prime Contractor (defined as certified payments received for equipment supply Contracts in progress and/or completed) during the last 5 years			
Year	Amount and Currency	Exchange rate	USD equivalent
[indicate year]	[insert amount and indicate currency]	[insert applicable exchange rate]	[insert amount in USD equivalent]
Average Annual Turnover *			

* The Bidder and its Parties shall provide **audited/ CA certified copies** of the above financial statement for 5 years pursuant to the Section III, Evaluation and Qualifications Criteria, Sub-factor 2.3.2.

* Total USD equivalent for all years divided by the total number of years, in accordance with the Section III, Evaluation and Qualification Criteria, Sub Factor 2.3.2, as appropriate.

Signature & Company Seal



Bid Form 15 FIR-1: Financial Resources

[The following table shall be filled in for the Bidder and for each member of a JV.]

Date: [insert day, month, year]

Bidder's Legal Name: [insert full name]

Joint Venture Party Legal Name: [insert full name]

IFB No.: MM3-CBS-DEQ-9-02

Page [insert page number] of [insert total number] pages

[Specify proposed sources of financing, such as liquid assets, unencumbered real assets, lines of credit, and other financial means, net of current commitments, available to meet the total construction cash flow demands of the subject Contract or Contracts as indicated in Section III, Evaluation and Qualification Criteria Sub-Factor 2.3.3].

Financial Resources		
No.	Source of financing	Amount (USD equivalent)
1		
2		
3		
4		

- The Bidder and its Parties shall **provide audited/ CA certified copies** of the above financial statement pursuant to the Section III, Evaluation and Qualifications Criteria, Sub-factor 2.3.3.

Signature & Company Seal



Bid Form 16 FIR-2: Current Contract Commitments

[The following table shall be filled in for the Bidder and for each member of a JV.]

Date: [insert day, month, year]

Bidder's Legal Name: [insert full name]

Joint Venture Party Legal Name: [insert full name]

IFB No.: MM3-CBS-DEQ-9-02

Page [insert page number] of [insert total number] pages

[Bidders and each member of a JV shall provide information on their current commitments on 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 an unqualified, full completion certificate has yet to be issued, in accordance with Section III, Evaluation and Qualification Criteria Sub-Factor 2.3.3]

Current Contract Commitments					
S.No.	Name of Contract	Employer's Contact Address, Tel, Fax	Value of all outstanding manufactured Equipment Supplies [Current USD Equivalent]	Estimated Completion Date	Average Monthly Invoicing Over Last Six Months [USD/month]
1					
2					
3					
4					
5					

Note: The Bidders and each member of a JV shall **provide audited/ CA certified copies** of the above financial statement pursuant to the Section III, Evaluation and Qualifications Criteria, Sub-factor 2.3.3.

Signature & Company Seal



Bid Form 17: Bid Capacity

[The following table shall be filled in for the Bidder and for each member of a JV.]

Date: [insert day, month, year]

Bidder's Legal Name: [insert full name]

Joint Venture Party Legal Name: [insert full name]

IFB No.: MM3-CBS-DEQ-9-02

Page [insert page number] of [insert total number] pages

Bid Capacity Calculation of Single Entity or Members of Consortium/JV

S. No	Bidder/ Each Member Name	Maximum value of 'Supplies of all Equipment manufactured' done in any one financial year during the last five years (Updated to 31 Mar 2019 price level) (A)	Total Value of existing commitments of "all manufacturing" (During period of completion of work commencing from 1 st April 2019 under this bid) (B)	No. of years, N=1.5 (N)	Bid Capacity (million USD) (2*A*N-B)



Bid Form 18: Form EXP - 1: General Experience

[The following table shall be filled in for the Bidder and for each member of a JV.]

Date: [insert day, month, year]

Bidder's Legal Name: [insert full name]

Joint Venture Party Legal Name: [insert full name]

IFB No.: MM3-CBS-DEQ-9-02

Page [insert page number] of [insert total number] pages

[Identify Contracts that demonstrate continuous work over the past [number] years pursuant to Section III, Evaluation and Qualification Criteria, Sub-Factor 2.4.1. List Contracts chronologically, according to their commencement (starting) dates.]

General Experience			
Starting Year	Ending Year	Contract Identification	Role of Bidder
[indicate year]	[indicate year]	<ul style="list-style-type: none"> Contract name: [insert full name] Brief description of the works performed by the Bidder: [describe works performed briefly] Amount of Contract: [insert amount, currency, exchange rate and USD equivalent] Name of Employer: [indicate full name] Address: [indicate street/number/town or city/country] 	[insert "Prime Contractor" (Single entity or JV member) or "Sub Contractor" or "Management Contractor"]

Signature & Company Seal



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Bid Form 19: Form EXP - 2: Specific Experience

[The following table shall be filled in for Contracts performed by the Bidder and by each member of a JV.]

Date: [insert day, month, year]

Bidder's Legal Name: [insert full name]

Joint Venture Party Legal Name: [insert full name]

IFB No.: MM3-CBS-DEQ-9-02

Page [insert page number] of [insert total number] pages

[Fill out one (1) form per Contract, in accordance with Section III, Evaluation and Qualification Criteria (Without Prequalification), Sub-Factor 2.4.2.]

Similar Contract No. [insert number] of [insert number of similar Contracts required]	Information		
Contract Identification	[insert Contract name and reference identification number, if applicable]		
Award date	[insert day, month, year, e.g., 15 June, 2015]		
Completion date	[insert day, month, year, e.g., 03 October, 2017]		
Role in Contract	Prime Contractor Only		
Total Contract Amount	[insert Contract amount(s) and currency(ies)]	USD [insert exchange rate and total Contract amount in USD equivalent]	
If member in a JV, specify participation in total Contract amount	[insert percentage of participation]	[insert amount(s) and currency(ies) of participation]	USD [insert exchange rate and amount of participation in USD equivalent]
Employer's Name	[insert full name]		
Address	[indicate street/number/town or city/country]		
Telephone/fax number	[insert telephone/fax numbers, including country and city area codes]		
E-mail	[insert E-mail address, if available]		



Similar Contract No. <i>[insert number of similar Contracts required]</i>	Information
Description of the similarity in accordance with Sub-Factor 2.4.2 of Section III:	
1. Physical size of required works items	<i>[insert physical size of items]</i>
2. Complexity	<i>[insert description of complexity]</i>
3. Methods/Technology	<i>[insert specific aspects of the methods/technology involved in the Contract]</i>
4. Other Characteristics	<i>[insert other characteristics as described in Section VI, Employer's Requirements]</i>

Signature & Company Seal



Bid Form 20: Certification of Minimum Local Content for availing Purchase Preference

We, the Bidder, do hereby certify that the Facilities offered under the Contract meet the minimum local content required for availing Purchase Preference as per Clause 1.2.2 (c), Section III, Eligibility and Qualification Criteria, Part 1.

The local content in the proposed Bid shall be _____ % of the total value of the Contract (Part A).

Authorized Signatory

[Insert name of signatory; title]

For and on behalf of [Insert name of the Bidder]

Date:

Notes:

- 1) The above Certificate is to be submitted only by those Bidders who wish to avail Purchase Preference as per Clause 1.2.2 (c), Section III, Eligibility and Qualification Criteria, Part 1.
- 2) In case of procurement for a value (Quoted in Schedule No. 6) is more than ₹ 10 crores, the Bidder shall provide a certificate from the statutory auditor or cost auditor of the company (in case of companies) or from a practicing cost accountant or practicing chartered accountant (in respect of suppliers other than companies) giving the percentage of local content.
- 3) For procurements up to ₹ 10 crores, the Bidder shall submit self-certification of the percentage of local content.
- 4) If any false declarations regarding local content is found, this will be in breach of the Code of Integrity under Rule 175(1)(i)(h) of the General Financial Rules for which the Bidder or its successor can be debarred for a period of 3 years as per Rule 151 (iii) of the General Financial Rules along with such other actions as may be permissible under the law.
- 5) A Bidder who has been debarred by any procuring entity for violation of the conditions of purchase preference shall not be eligible for preference for procurement by any other entity for the duration of the debarment. The debarment for such other procuring entities shall take effect prospectively from the date on which it comes to the notice of the other procuring entities.



Bid Form 21 MAN: Manufacturer's Authorization

[The Bidder shall require the Manufacturer to fill in this Form in accordance with the instructions indicated Clause 2.5.6, Section III, Part 1. This letter of authorization shall be signed by a person with the proper authority to sign documents that are binding on the Manufacturer].

Date: [insert date (dd-mm-yyyy) of Bid Submission]
IFB No.: MM3-CBS-DEQ-9-02

To: [insert complete name of Purchaser]

WHEREAS

We [insert complete name of Manufacturer or Manufacturer's authorized agent], who are official manufacturers of [insert type of goods manufactured], having factories at [insert full address of Manufacturer's factories], do hereby authorize [insert complete name of Bidder] to submit a Bid the purpose of which is to provide the following goods, manufactured by us [insert name and/or brief description of the goods], and to subsequently negotiate and sign the Contract.

We hereby extend our full guarantee and warranty in accordance with Clause 27, Defect Liability, of the General Conditions of Contract, with respect to the goods offered by the above firm.

Name: [insert complete name of person signing the Bid]

In the capacity of [insert legal capacity of person signing the bid]

Signed: [insert signature of person whose name and capacity are shown above]

Duly authorized to sign the bid for and on behalf of: [insert complete name of Bidder]

Dated on _____ day of _____, _____ [insert date of signing]



Form ACK: Acknowledgement of Compliance with the Guidelines for Procurement under Japanese ODA Loans

- A) I, *[insert name and position of authorized signatory]*, being duly authorized by *[insert name of Bidder/members of joint venture ("JV")]* (hereinafter referred to as the "Bidder") to execute this Acknowledgement of Compliance with Guidelines for Procurement under Japanese ODA Loans, hereby certify on behalf of the Bidder and myself that all information provided in the Bid submitted by the Bidder for [Loan No ID-P268 and project Mumbai Metro Line 3 (Colaba – Bandra – SEEPZ)] is true, correct and accurate to the best of the Bidder's and my knowledge and belief. I further certify, on behalf of the Bidder, that:
- (i) the Bid has been prepared and submitted in full compliance with the terms and conditions set forth in the Guidelines for Procurement under Japanese ODA Loans (hereinafter referred to as the "Guidelines"); and
 - (ii) the Bidder has not, directly or indirectly, taken any action which is or constitutes a corrupt, fraudulent, collusive or coercive act or practice in violation of the Guidelines and is not subject to any conflict of interest as stipulated in the relevant section of the Guidelines.

<If debarment for more than one year by the World Bank Group is NOT imposed, use the following sentence B).>

- B) I certify that the Bidder has NOT been debarred by the World Bank Group for more than one year since the date of issuance of Invitation for Bids.

<If debarment for more than one year by the World Bank Group has been imposed BUT three (3) years have passed since the date of such debarment decision, use the following sentence B').>

- C) I certify that the Bidder has been debarred by the World Bank Group for a period more than one year BUT that on the date of issuance of Invitation for Bids at least three (3) years had passed since the date of such debarment decision. Details of the debarment are as follows:

Name of the debarred firm	Starting date of debarment	Ending date of debarment	Reason for debarment

- D) I certify that the Bidder will not enter into a subcontract with a firm which has been debarred by the World Bank Group for a period more than one year, unless on the date of the subcontract at least three (3) years have passed since the date of such debarment decision.
- E) I certify, on behalf of the Bidder, that if selected to undertake services in connection with the Contract, the Bidder shall carry out such services in continuing compliance with the terms and conditions of the Guidelines.
- F) I further certify, on behalf of the Bidder, that if the Bidder is requested, directly or indirectly, to engage in any corrupt or fraudulent action under any applicable law, such



as the payment of a rebate, at any time during a process of public procurement, negotiations, execution or implementation of Contract (including amendment thereof), the Bidder shall report all relevant facts regarding such request to the relevant section in JICA (details of which are specified below) in a timely manner.

JICA's information desk on fraud and corruption (A report can be made to either of the offices identified below.)

- (1) JICA Headquarters: Legal Affairs Division, General Affairs Department
URL: <https://www2.jica.go.jp/en/odainfo/index.php>
Tel: +81 (0)3 5226 8850
- (2) JICA India office,
2nd Floor, Dr. Gopal Das Bhawan, 28, Barakhambha Road, New Delhi - 110001
Tel: +91 11 47685500
FAX: +91 11 47685555
URL <http://www.jica.go.jp/india/english/office/index.html>

The Bidder acknowledges and agrees that the reporting obligation stated above shall NOT in any way affect the Bidder's responsibilities, obligations or rights, under relevant laws, regulations, Contracts, guidelines or otherwise, to disclose or report such request or other information to any other person(s) or to take any other action, required to or allowed to, be taken by the Bidder. The Bidder further acknowledges and agrees that JICA is not involved in or responsible for the procurement process in any way.

If any of the statements made herein is subsequently proven to be untrue or incorrect based on facts subsequently determined, or if any of the warranties or covenants made herein is not complied with, the Bidder will accept, comply with, and not object to any remedies taken by the Employer and any sanctions imposed by or actions taken by JICA.

Authorized Signatory

[Insert name of signatory; title]

For and on behalf of [Insert name of the Bidder]

Date:



Form DBR

[The following statement shall be signed and stamped by the Bidder and by each member of a JV as well as any specialist Sub Contractor proposed to be used by the Bidder for any part of the Contract]

By virtue of my signature below, I confirm that the Bidder represented by me for submitting Bid for Mumbai Metro Line-3 - Design, Manufacture, Supply, Installation, Testing & Commissioning and Comprehensive Maintenance Service of Automatic Train Wash Plant [MM3-CBS-DEQ-9-02] is/are not **DEBARRED/BLACKLISTED** by Delhi Metro Rail Corporation and/or other Metro Rail Corporation chaired by Secretary of Ministry of Urban Development, Government of India as on the due date of submission of Bid.

Signed: _____

Date: _____

NOTE: Copy of the Notification of such Debarment/Blacklist shall be submitted in the Bid, in the case the Bidder is Debarred/Blacklisted.




Form of Bid Security (Bank Guarantee)

(To be stamped in accordance with the Stamp Act of the Country of Issuing Bank)

[Guarantor letterhead or SWIFT identifier code]

Beneficiary: Mumbai Metro Rail Corporation Ltd, MMRC Line 3 Transit Office, Wing 'A', 'E' Block, Bandra-Kurla Complex, Bandra (East), Mumbai 400 051, India.

IFB No.: [MM3-CBS-DEQ-9-02]

Date: [insert date of issue]

BID GUARANTEE No.: [insert guarantee reference number]

Guarantor: [insert name and address of place of issue, unless indicated in the letterhead]

We have been informed that [insert name of the Bidder, which in the case of a joint venture shall be the name of the joint venture (whether legally constituted or prospective) or the names of all members thereof] (hereinafter called "the Applicant") has submitted or will submit to the Beneficiary its Bid (hereinafter called "the Bid") for the Design, Manufacture, Supply, Installation, Testing & Commissioning and Comprehensive Maintenance Service of Automatic Train Wash Plant for Mumbai Metro Line 3 (Colaba – Bandra – SEEPZ) Project under Loan Agreement No. [ID-P268].

Furthermore, we understand that, according to the Beneficiary's conditions, Bids must be supported by a Bid guarantee.

We, as Guarantor, hereby irrevocably undertake to pay the Beneficiary any sum or sums not exceeding in total an amount of [insert amount in words, (insert amount in figures)] upon receipt by us of the Beneficiary's complying demand, supported by the Beneficiary's statement, whether in the demand itself or a separate signed document accompanying or identifying the demand, stating that either the Applicant:

- (a) Has withdrawn its Bid during the period of Bid validity set forth in the Applicant's Letter of Bid (hereinafter called "the Bid Validity Period"), or any extension thereto provided by the Applicant; or
- (b) Having been notified of the acceptance of its Bid by the Beneficiary during the Bid Validity Period or any extension thereto provided by the Applicant, (i) fails to execute the Contract Agreement, or (ii) fails to furnish the Performance Security, in accordance with the Instructions to Bidders of the Beneficiary's Bidding Documents.

This guarantee will expire on _____ (Expiry Date) and shall be returned to the Applicant:

- (a) if the Applicant is the successful Bidder, upon our receipt of copies of the Contract Agreement signed by the Applicant and the Performance Security issued to the Beneficiary in relation to such Contract Agreement; or
- (b) if the Applicant is not the successful Bidder, upon the earlier of (i) our receipt of a copy of the Beneficiary's notification to the Applicant of the results of the Bidding process; or (ii) twenty-eight (28) days after the end of the Bid Validity Period.

Consequently, any demand for payment under this guarantee must be received by us at the office indicated above on or before that date.

This guarantee is subject to the Uniform Rules for Demand Guarantees, ICC Publication No. 758.



[Signature]

Below is not the part of BG format

Note for information of the Bidder:

- 1) The terms 'Bidder' and 'Applicant' have been used interchangeably in the above **Form of Bid Security (Bank Guarantee)** meaning the same as the 'Bidder' as stated in ITB 4. The term 'Applicant' shall not be construed as the applicant who has approached the Bank for issuing the Bank Guarantee(s).
- 2) The Bidder shall be careful while getting the Bank Guarantee(s) prepared from their Bankers as any default in the correctness of BG as per the BG requirements shall lead to rejection.

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BIDDING DOCUMENTS



MUMBAI METRO LINE 3 (COLABA-BANDRA-SEEPZ)

CONTRACT MM3-CBS-DEQ-9-02

Design, Manufacture, Supply, Installation, Testing, Commissioning
and Comprehensive Maintenance Service of
Automatic Train Wash Plant
for Project "Mumbai Metro Line-3"

Part 1

Bidding Procedure

Section IV-B

Pricing Document

January - 2020

Mumbai Metro Rail Corporation Ltd

MMRCL Line 3 Transit Office,

Wing A, Block E,

Bandra-Kurla Complex,

Bandra (East), Mumbai- 400 051, India.



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Bidding Documents

Composition of Documents

Part 1	Bidding Procedure
Section I	Instructions to Bidders
Section II	Bid Data Sheet
Section III	Evaluation and Qualification Criteria
Section IV-A	Bidding Forms
Section IV-B	Pricing Document
Section V	Eligible Source Countries of Japanese ODA Loans
Part 2	Employer's Requirements
Section VI-A	Employer's Requirements – General Specifications
Section VI-B	Employer's Requirements – Technical Specifications
Part 3	Conditions of Contract and Contract Forms
Section VII	General Conditions of Contract (GCC)
Section VIII	Particular Conditions of Contract (PCC)
Section IX	Contract Forms
Section X	Special Conditions for Comprehensive Maintenance Service Contract
Part 4	Drawings
Section XI	List of Drawings



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TABLE OF CONTENTS

1.1	Preamble 1	
1.2	Contract Price	1
1.3	Description of Pricing Schedule	3
1.3.1	Schedule No. 1	4
1.3.2	Schedule No. 2	4
1.3.3	Schedule No. 3	4
1.3.4	Schedule No. 4	5
1.3.5	Schedule No. 5: (Provisional Sums)	5
1.3.6	Schedule No. 6	5
1.3.7	Schedule No. 7	5
1.3.8	Schedule No. 8	5
1.3.9	Price / Cost Breakdown	6
1.4	Payment Concept	6
	Schedules of Rates and Prices	8
	Schedule No. 1: <i>Automatic Train Wash Plant</i> , to be supplied from abroad	8
	Schedule No. 2: <i>Automatic Train Wash Plant</i> , to be supplied from within the Employer's country	10
	Schedule No. 3: Design Services: <i>Automatic Train Wash Plant</i>	11
	Schedule No. 4: Installation, Testing & Commissioning, and Other Services - <i>Automatic Train Wash Plant</i>	12
	Schedule No. 5: Provisional Sums -	13
	Schedule No. 6: Grand Summary (Facilities) <i>Automatic Train Wash Plant</i>	14
	Schedule No. 8. Comprehensive Maintenance Service: <i>Automatic Train Wash Plant</i>	21
	Schedule No. 9: Statement of Nonmaterial Nonconformities : <i>Automatic Train Wash Plant</i>	23
	Appendix A1: Mandatory Spares	25



1.1 Preamble

The Pricing Document shall be read in conjunction with Invitation for Bids, Instructions to Bidders and all Bidding Documents, Specifications and Drawings as listed in Sub-Clause 6.1 of Part 1, Section I, ITB and Section II, BDS. Part A of the Contract (Design, Manufacture, Supply, Installation, Testing & Commissioning of the Facilities including supply of O&M manuals, Training of Employer's O&M staff) is a Fixed Price Contract. Price variation clause is applicable on Part B of the Contract (Comprehensive Maintenance Service of the Equipment during DLP and post DLP). The Pricing Document is divided into Schedules representing one or more groups of inter-related facilities. The detailed Scope of work is given in Part 2, Section VI-B, Employer's Requirement – Technical Specifications.

The individual item descriptions within each Schedule are indicative only of the Work included in this Contract and shall not be taken as defining the scope of work to be executed either under the Schedule or the Contract.

The item descriptions, if given, are general summaries only. Therefore, no omission from, or error in item descriptions within this Pricing Document shall warrant an adjustment of the Contract Price nor entitle the Contractor to seek an extension of time under the Contract.

The activity descriptions for items within Schedule shall be deemed to cover all aspects of the relevant item scope, irrespective of the fact that the Bidder may not have inserted an amount against any item description. The total amount of each Schedule shall be deemed inclusive of all of the Contractor's obligations to execute the part of the Facilities covered by the Schedule and to perform all of his other obligations under the Contract in respect thereof. The Contractor shall not be entitled to receive any further or additional payment in respect of such Schedule.

If Bidders are unclear or uncertain as to the scope of any item, they shall seek clarification in accordance with ITB 7 prior to submitting their Bid.

Prices shall be filled in indelible ink and any alterations necessary due to errors, etc., shall be initialled by the Bidder.

The person authorized to sign on behalf of the Bidder shall sign in full, with company seal and date, at the bottom of all pages of the Pricing Schedule.

1.2 Contract Price

The Contract Price consists of price for Design, Manufacture, Supply, Installation, Testing & Commissioning of the Facilities including supply of O&M manuals and training of Employer's O&M staff (Part A of the Contract) and for Comprehensive Maintenance Service of the Equipment during DLP and post DLP (Part B of the Contract) as per the requirements given in Employer's Requirements- Technical Specifications, Section VI-B, Part 2.

- 1.2.1 All the prices shown in the Schedules shall also include all taxes, duties, levy, cess, insurance, transportation, handling costs, unloading at site etc. which constitute the Contract Price and will be the total amount to be paid to the Contractor for executing the



Works and performing all other obligations under the Contract. The prices in different Schedules shall be quoted as per ITB 19.1, Section II, Part 1.

1.2.2 The Schedules and the Contract Prices shall not be subject to adjustment by the Contractor in respect of any error or oversight in the Pricing Document. The Pricing Document represents the full extent of the Contractor's entitlement to receive payment as per the Schedules. Arithmetical errors, if any found in the Contractor's submission, will be corrected by the Employer as indicated in the Instruction to Bidders, Clause No 36.1, Part 1.

1.2.3 The rate for each item detailed in Schedule Nos. 1, 2, 3, 4, 5 & 6 (Grand summary), 7 (Recommended spare parts) and 8 (Comprehensive Maintenance Service) are for finished items of work, 100% complete in all respects, and shall include but not be limited to the preliminary and detailed design, supply of all materials, equipment, landing charges, shipping costs for transport by air, sea or land (or any combination thereof), insurance charges, taxes, duties, levy, cess, etc. unloading, storage, installation, factory testing, testing & commissioning at site including intergrated testing with other designated Contractor, supply of spare parts and special tools, training of employer's O&M staff, provision of as-built drawings, provision of O&M manuals, and all types of clearances/approvals required from government authorities. The rate also includes the Contractor's profit and establishment overhead, all general risks, insurance liabilities, compliance with labour laws as per statutory obligations set out or implied in the Contract, attending to defects list prepared by the Employer prior to handover of works and facilities, and any other Contractual requirements stated in the Employer's requirements.

1.2.4 Deemed Export

The Bidder shall be solely responsible for claiming and availing all deemed export benefits if available during the currency of Contract. However, for availing the said benefits, necessary payment certificate in accordance with the laws of the land and extant policies of the Government of India will be issued by MMRC at the specific request of the Contractor. Contractor shall process for refund for 100% of the paid Custom Duties/Basic custom duty (as applicable) only and full terminal excise duties for items as above after availing the concessional duties such as Project Import Benefits under chapter 98.01 of Customs Tariff Act, etc. from the Statutory Authorities based on submission of documentary evidence by the Contractor. Contractor shall be fully responsible for ensuring that all necessary documentation/information, as may be required, for processing the refund of paid duties from the Statutory Authorities are correctly prepared by them and are timely submitted, so as to claim the refund of paid duties from the Statutory Authorities. The Contractor shall arrange for the remittance of the refund so obtained to the Employer within 15 days. In case of failure by the Contractor to obtain and remit the refund within reasonable time (to be decided by the Project Manager & intimated to Contractor) to the Employer, the same will be recovered by the Employer from the amounts due as payment to the Contractor or as debt due from the Contractor.

1.2.5 Exemption in state taxes

In case of any waiver/ reduction subsequent to the Base Date for GST (CGST, SGST, IGST, UGST etc.) and any other tax, duties, levy, cess, etc, Custom duties in full or part thereof, the Contractor will be required to obtain exemption/refund of such taxes, duties etc., from the concerned authorities. The Contractor shall arrange for the remittance of



the refund so obtained to the Employer. In case of failure by the Contractor to obtain and remit the refund within reasonable time (to be decided by the Project Manager & intimated to Contractor) to the Employer, the same will be recovered by the Employer from the amounts due as payment to the Contractor or as debt due from the Contractor. If the Contractor fails to take the required action to obtain refund or exemption, the Employer shall take action in accordance with the Conditions of Contract.

1.2.6 Record of Taxes, Duties etc.

The Bidder shall also give breakdown of his fixed Price clearly giving the Custom Duty, GST (CGST, SGST, IGST, UGST etc.) and any other Tax, levy, Cess, etc. along with the applicable rate in the Form attached as Appendix A of Schedule No. 6 (Grand Summary).

The Contractor shall maintain complete records in respect of payments made by them for taxes, duties, and other levies payable to various authorities (except Income Tax or Corporate Tax) and advise the Employer the summary of such payment every quarter in a format advised by the Employer during execution of the Contract.

The detailed records shall however remain open for inspection by the Employer/ Project Manager at any time and copies of the records shall be furnished as required by the Project Manager. Should there be any statutory changes in taxes & duties with respect to the tax structure as on base date, the amount payable/recoverable from the Contractor in accordance with the conditions of the Bid will generally be calculated based on these records. However, Employer at his sole discretion, if not satisfied with the veracity of records or records are incomplete or otherwise, may separately determine the amount payable/recoverable from the Contractor in accordance with the conditions of the Bid, which shall be final and binding.

1.2.7 Concessional benefits for Project Import

MML3 Metro Project is eligible for availing concessional duty benefits as per Customs Tariff Act for Project Imports and Bidders shall refer to Project Import Regulation 1986 (PIR), Section 5, read along with Customs Manual Chapter 5, Para 3, 4 & 5. After award of Contract, at the request of the Contractor, MMRC shall issue sponsoring/ recommendation letter to the Contractor for getting themselves registered for availing Project Import Benefit. However, the responsibility to avail the concessional benefits under Project Import or otherwise as extended in accordance with the law of the land shall solely rest with the contractor and all logistics and other arrangement in connection with the import of material shall remain with the Contractor as per the Bid conditions.

1.3 Description of Pricing Schedule

The Pricing Documents comprise the following Schedules:

Schedule No. 1- Plant, to be supplied from abroad;

Schedule No. 2- Plant, to be supplied from within the Employer's country;

Schedule No. 3- Design services.

Schedule No. 4- Installation, Testing & Commissioning, and Other Services.

Schedule No. 5- Provisional Sums (Not used)

Schedule No. 6- Grand Summary

Schedule No. 7- Recommended Spare parts

Schedule No. 8- Comprehensive Maintenance Service



Schedule No. 9- Pricing for unqualified withdrawal of conditions, qualifications, Non-material Non-conformities, etc.

1.3.1 Schedule No. 1

Schedule No. 1 is dedicated to Plant, to be supplied from abroad at MMRC Depot, Mumbai as per the requirements and other details given in the Part 2 Section VI-B, Contract Drawings included in Part 4 and other specifications.

This Schedule comprises all those obligations and ongoing activities throughout the Contract not associated directly with any other Schedule.

This includes but is not limited to:

- Completion of manufacture offshore.
- Completion of Inspection, all routine Testing of Equipment in Factory,
- Completion of all Factory Acceptance Tests in Factory,
- Completion of despatch from offshore factory, Provision of Marine and Transit Insurance from off-shore Factory inclusive of release of Equipment from Customs at port in India and inland transportation up to the Metro Depot.
- Delivery and unloading of Plant at MMRC depot in good condition,
- Completion of supply of Mandatory Spares to Metro depot site, Mumbai and its successful inspection,
- Any other item not listed but is considered necessary to comply with the scope of work

1.3.2 Schedule No. 2

Schedule No. 2 is dedicated to Plant, to be supplied from within the Employer's country at MMRC Depot, Mumbai as per the requirements and other details given in the Part 2, Section VI-B, Contract Drawings included in Part 4 and other specifications.

This Schedule comprises all those obligations and ongoing activities throughout the Contract not associated directly with any other Schedule.

This includes but is not limited to:

- Completion of manufacture.
- Completion of Inspection, all routine Testing of Equipment in Factory,
- Completion of all Factory Acceptance Tests,
- Completion of despatch from Factory with Provision of Transit Insurance to MMRC depot, Mumbai inclusive of inland transportation up to the Metro Depot.
- Delivery and unloading of Plant in MMRC depot in good condition,
- Completion of supply of Mandatory Spares to MMRC depot in Mumbai and its successful inspection,
- Any other item not listed but is considered necessary to comply with the scope of work.

1.3.3 Schedule No. 3

Schedule No. 3 is dedicated to the activities relating to Design Services as per the requirements and other details given in the Technical Specifications, Section VI-B, Part 2, and other Specifications.

This Schedule comprises all those obligations and ongoing activities throughout the Contract not associated directly with any other Schedule.

This includes but is not limited to getting NoNO from the Project Manager on the submissions of:



- Foundation Drawing
- Preliminary Design of the Facilities
- Final Design of the Facilities
- Work program
- Quality Plan
- Safety Plan
- Inspection & Testing Plan
- Installation, Testing & Commissioning Plan
- Maintenance Plan
- 3-D BIM model of the Facilities

1.3.4 Schedule No. 4

Schedule No. 4 is dedicated to the Facilities related to Installation, Testing & Commissioning and all other allied activities as per the Employer's Requirements stated in Part 2, Sections VI-A & VI-B, Drawings and other Specifications and detailed below.

This Schedule comprises all those obligations and ongoing activities throughout the Contract not associated directly with any other Schedule.

This includes but is not limited to:

- Installation, Testing & Commissioning (including Guarantee Testing) of Plant,
- Training of Operating & Maintenance personnel of Employer at Metro Depot by deputing Instructors.
- Submission of "As-Built drawings"
- Submission of Training Manuals
- Submission of Operating and Maintenance Manuals
- Provision of Spare parts Catalogue
- Any other item considered necessary by the Contractor to comply with the Scope of Works,

1.3.5 Schedule No. 5: (Provisional Sums)

Not Used

1.3.6 Schedule No. 6

Schedule No. 6 is dedicated to the Grand Summary of Prices quoted against Schedule Nos. 1, 2, 3, 4 and 5. Total of Schedule – Grand Summary to be carried forward to Bid Form.

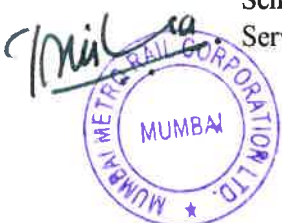
The Bidder shall also give breakdown of his fixed Lump Sum Price clearly giving the Custom Duty, GST (CGST, SGST, IGST, UGST etc.) and any other Tax, levy, Cess, etc. along with the applicable rate in the Form attached as Appendix A to this Schedule No.6.

1.3.7 Schedule No. 7

This schedule pertains to spares parts, consumables, lubricants and special tools recommended by the Bidder. The prices quoted under this Schedule shall remain fixed till the acceptance of the Facilities (issue of Operational Acceptance Certificate) and thereafter shall be adjusted in accordance with Appendix 2, Contract Forms, Section IX, Part 3.

1.3.8 Schedule No. 8

Schedule No. 8 is dedicated to the activities relating to Comprehensive Maintenance Service as per the requirements given in the Clause 4, Comprehensive Maintenance



Services, Section VI-B, Part 2 – Employer’s Requirements, Technical Specifications & Section X, Part 3. This is an inseparable part of the Contract.

The Comprehensive Maintenance service shall be provided during DLP and for a period of 5 years after DLP. Payments for Maintenance services will be made on a quarterly basis at the rates quoted under Schedule 8. The price shall be quoted for CMS during of DLP for every quarter and the same shall be payable in eight (08) equal quarterly instalments as a fixed price. The Price for CMS for the 5 years Post-DLP shall be quoted for a quarter corresponding to the Base Date of the Contract and shall be adjusted for each quarter in accordance with Appendix 2, Contract Forms, Section IX, Part 3.

When evaluating and comparing different Bids, the Comprehensive Maintenance Services cost for the total period without applying any future price variation will be taken into consideration and used for the purpose of determining the lowest Bidder.

1.3.9 Price / Cost Breakdown

- a) The total of Schedule Nos. 1, 2, 3, 4 and 5, carried forward to Schedule 6 (Grand Summary) of this Pricing Document, shall be deemed to include all costs associated with the supply, manufacture and delivery to Site of such item by the Contractor (including, without limitation, the cost of design, manufacture, packing, supply and delivery to Site, testing & commissioning, labour cost, preliminaries and other general requirements, overheads and profit, taxes, duties, any other costs etc.) irrespective of the quantity of the items to be supplied.
- b) Variations will only be considered if there is any additional work required beyond the scope as mentioned in Part 2 Section VI-A & VI-B - Employer’s Requirements, Drawings and Specifications and as mentioned in this section elsewhere or the Project Manager instructs any changes to the existing scope.
- c) Payments to the Contractor will be made in accordance with Terms and Procedure for Payment as mentioned in Appendix 1 to Contract Forms in Part 3, Section IX.
- d) No payment will be made against any item in the Contractor’s Pricing Document which has a value entered against in the Amount column as indicating ‘0’, ‘NIL’ or left blank.

1.4 Payment Concept

Payment will be calculated as per Appendix 1, Section IX, Contract Forms, subject to the Project Manager/Employer being satisfied that the Facilities for each item are 100% complete. Payment will be based on the Contractor’s submission of a stage-wise statement in the case of supply portion of the Contract and quarterly statement in the case of Comprehensive Maintenance Services as per Appendix 1, Section IX, Contract Forms.

a) Apportionment of Lump Sum Price to Schedules & Milestones under Each Schedule

1. The whole of Facilities is divided into Schedules. Each of these Schedules represents a major item associated with the Facilities. Schedules are named according to their general scope of Work.
2. The Lump Sum price for the whole of Facilities shall be apportioned by the Bidder among the various Schedules.
3. In case of a Joint Venture/Consortium, Payment will be made in the name of Joint Venture/Consortium only. However, on combined request by all members of JV/Consortium, payments can be made to Individual JV/Consortium members with approval of the Employer.
4. The sums of amounts shown in a Schedule Nos. 1, 2, 3, 4 & 5 are the amounts that



are to be carried forward to the Grand Summary at Schedule No. 6. For Schedules that involve payment in foreign currency, the division of the respective Schedule amounts between INR, JYP, USD and Euro shall be shown in the said Summary.

5. The scope and extent of the Facilities are to be ascertained by reference to the Contract documents as a whole and shall not be limited in any manner whatsoever by the descriptions of the Schedules.
 6. The maximum/ minimum amount or percentage of the total price that can be apportioned to Schedule Nos. 3 and 4 is indicated in the respective schedules.
- b) **Custom Clearance**

The Contractor shall be solely responsible for Custom clearances (including any other related activities) of all items that may be directly or indirectly required for execution of this Contract.



Schedules of Rates and Prices

Schedule No. 1: Automatic Train Wash Plant, to be supplied from abroad

Item	Description	Amount			
		INR	JYP	EURO	USD
1	<p>Obtain the "Notice of No Objection" or "Notice of No Objection Subject to ---" from the Project Manager as per Employer's Requirement (detailed in Part 2) after completion of all the following:</p> <ul style="list-style-type: none"> • Completion of manufacture offshore. • Completion of Inspection, all testing of Equipment in Factory, • Completion of all Factory Acceptance Tests, • Completion of despatch from offshore factory, Provision of Marine and Transit Insurance from off-shore Factory inclusive of release of equipment at port in India and inland transportation up to the Metro Depot. • Delivery and unloading of Plant in MMRC depot in good condition, • Completion of supply of Mandatory Spares to MMRC Metro depot, Mumbai and its successful inspection, • Any other item not listed but is considered necessary to comply with the scope of work. 				
2	Mandatory Spares - (Details to be given as per Appendix- A1)				
Total (to be carried to Schedule No. 6 Grand Summary)					
		Name of the Bidder			
		Signature of the Bidder			



Note:

- Only items to be supplied from abroad are to be quoted in this statement. If an item is to be supplied from within the country, its to be quoted in Schedule No.2.

Country of Origin Declaration Form

Item	Description	Code	Country



Mishra

Schedule No. 2: Automatic Train Wash Plant, to be supplied from within the Employer's country

Item	Description	INR
		Amount
1	Obtain the "Notice of No Objection" or "Notice of No Objection Subject to ---"from the Project Manager as per Employer's Requirement (detailed in Part 2) after completion of all the following: <ul style="list-style-type: none"> • Completion of manufacture offshore. • Completion of Inspection, all testing of Equipment in Factory, • Completion of all Factory Acceptance Tests, • Despatch of Plant from onshore factory; • Inland transportation in India and Transit Insurance • Delivery of Plant and its unloading at MMRC Depot site, Mumbai in good condition; 	
2	Mandatory Spares – (Details to be given as per Appendix- A1)	
Total (to be carried to Schedule No. 6 Grand Summary)		
Name of the Bidder		
Signature of the Bidder		

Note:

- Only items to be supplied from within the country are to be quoted in this Schedule No. 2 . If an item is to be supplied from abroad, its to be quoted in Schedule No.1.



Schedule No. 3: Design Services: Automatic Train Wash Plant

Item	Description	Amount			
		INR	JPY	EURO	USD
1	Obtain the "Notice of No Objection" or "Notice of No objection Subject to ---" from the Project Manager as per Employer's Requirement (detailed in Part 2) for: <ul style="list-style-type: none"> • Foundation Drawing of the Facilities, • Preliminary design of the Facilities, • Final Design of the Facilities, • Work Programme; • Design Submission program • Management Plans • 3-D BIM model • Finalisation of Interfacing work with Interfacing Contractors. 				
	Total (to be carried to Schedule No. 6 Grand Summary)				
		Name of the Bidder			
		Signature of the Bidder			

Notes:

- The total amount quoted in Schedule No. 3 will not be more than 10% of the Grand Summary in Schedule No. 6.



Schedule No. 4: Installation, Testing & Commissioning, and Other Services - Automatic Train Wash Plant

Item	Description	INR	JPY	USD	EURO
		Amount	Amount	Amount	Amount
1	Obtain the "Notice of No Objection" or "Notice of No Objection Subject to ---" " from the Project Manager as per Employer's Requirement (detailed in Part 2) for: <ul style="list-style-type: none"> • Installation of Plant and completion of functional tests and running of Plant in the Depot. • Completion of Commissioning including Guarantee Testing in the Depot; • Submission of "as built drawings" • Submission of Training Manual and O&M Manuals, • Completion of Training of Employer's O&M Staff at Site. • Submission of Spare Parts catalogue. 				
	Total (to be carried to Schedule No. 6 Grand Summary)				
		Name of the Bidder			
		Signature of the Bidder			

NOTE:

- The total amount quoted in Schedule 4 will not be less than 20% of the Grand Summary in Schedule 6.



Schedule No. 5: Provisional Sums -



DELETED

Schedule No. 6: Grand Summary (Facilities) Automatic Train Wash Plant

Schedule	Description	Amount INR	Amount JPY	Amount USD	Amount EURO
1	Plant Unit Exchange Spares and mandatory spare parts to be supplied from abroad				
2	Plant Unit Exchange Spares and mandatory spare parts to be supplied within the Employer's country				
3	Design Services				
4	Installation, Testing & Commissioning, and Other Services.				
5	Provisional Sums (Not Used)	-	-	-	-
	TOTAL				

EQUIVALENT BID TOTAL (In figures): USD _____

EQUIVALENT BID TOTAL (In words): US Dollars _____

	Name of the Bidder
	Signature of the Bidder

Notes:

- Payments for this Contract will be made in Indian Rupees, Japanese JPY and/or maximum two other international currencies (USD or EURO), if the Contractor so desires, or in a combination of all four currencies.
 - The Bidder shall complete the equivalent Bid Total in USD in figures and words above.
 - For the conversion to USD/Euro/JPY for INR equivalent the date of exchange rate will be Base Date as mentioned in ITB 37.1. The rate for conversion shall be as published by Reserve Bank of India and if the rate is not published, the as per the website of www.xe.com
 - Deviations are to be indicated in the Statement of Deviations, Section IV-A, Bidding Form 3. The price for unqualified withdrawal of the deviations shall be entered in Schedule No. 9 of the Price Schedule and the Employer shall add this price to the quoted price for the purpose of comparison of Bids to ascertain the lowest Bidder.
-

Appendix A

Details of Taxes/Duties/Levies, etc. included in The Bid Price

Sr. No.	Taxable Amount	Custom Duty		CGST		SGST		IGST		UGST		Any Other Tax/Levy/Cess etc		Total Amount of all Taxes/Duties /Levies/Cess etc
		Rate %	Amount	Rate %	Amount	Rate %	Amount	Rate %	Amount	Rate %	Amount	Rate %	Amount	
<u>Schedule No. 1*</u>														
1														
2														
3														
4														
5														
Total														
<u>Schedule No. 2*</u>														
1														
2														
3														
4														
5														
Total														
<u>Schedule No. 3*</u>														
1														
2														
3														



Sr. No.	Taxable Amount	Custom Duty		CGST		SGST		IGST		UGST		Any Other Tax/Levy/Cess etc		Total Amount of all Taxes/Duties /Levies/Cess etc
		Rate %	Amount	Rate %	Amount	Rate %	Amount	Rate %	Amount	Rate %	Amount	Rate %	Amount	
4														
5														
Total														
<u>Schedule No. 4*</u>														
1														
2														
3														
4														
5														
Total														
<u>Schedule No. 5*</u>														
1														
2														
3														
4														
5														
Total														
<u>Schedule No. 7*</u>														
1														
2														
3														
4														



Sr. No.	Taxable Amount	Custom Duty		CGST		SGST		IGST		UGST		Any Other Tax/Levy/Cess etc		Total Amount of all Taxes/Duties /Levies/Cess etc
		Rate %	Amount	Rate %	Amount	Rate %	Amount	Rate %	Amount	Rate %	Amount	Rate %	Amount	
5														
Total														
Schedule No. 8*														
1														
2														
3														
4														
5														
Total														
Grand Total														

*Please mention similar group of goods/services which attract same rate of tax under each schedule. Bidder shall add more rows wherever required.
 Refer to Clause 1.2.3 of Section IV-B above and the Notes below for an explanation of the above table.

NOTES:

The Bidder is to give in his Bid offer, a breakdown of his fixed Lump Sum Price clearly detailing the following:

- Custom duty on offshore manufactured Plant/ Equipment, if any along with rate of Custom duty.
- GST (CGST/SGST/IGST/UGST, etc) (after availing relevant Credit) on completely assembled/manufactured Plant/ Equipment, if any along with rate of GST (CGST/SGST/IGST/UGST, etc).
- Custom duty on imported spares, special tools, etc.. along with rate of Custom duty.





- GST (CGST/SGST/IGST /UGST, etc) on Spares, Jigs, Fixtures, Special tools, Testing and Diagnostic Equipment etc. along with rate of GST.
- GST (CGST/SGST/IGST/UGST, etc) on the completely assembled/manufactured Plant/ Equipment along with the rate of GST.
- GST (CGST/SGST/IGST/UGST, etc) on the indigenous finished Spares, Special tools and Testing Equipment etc. along with rate of GST.
- GST (CGST/SGST/IGST/UGST, etc) on works along with applicable rate.
- Any other tax/ levies/ Cess. etc. (If applicable)
- If the rates of taxes mentioned in above table is different from the actual applicable rates, then the actual applicable rates will be considered for variation purpose only, however no change in Bid prices quoted in different schedules shall be considered.

Name of the Bidder	
Signature of the Bidder	

Schedule No. 7: Recommended Spare Parts, Operational Spares, Consumables, Lubricants, Unit Exchange Spares and Special Tools - *Automatic Train Wash Plant*

Item	Description	Unit	Qty	INR		JPY		USD		EURO	
				Unit Rate	Amount	Unit Rate	Amount	Unit Rate	Amount	Unit Rate	Amount
1.											
2.											
3.											
4.											
5.											
6.											
7.											
.											
.											
.											
Name of the Bidder											
Signature of the Bidder											



Schedule No. 8. Comprehensive Maintenance Service: Automatic Train Wash Plant

Comprehensive Maintenance Service including the supply of all required spares, consumables, lubricants, tools and test equipment for 2 years of DLP and for a period of 5 years after completion of DLP as per Employer's Requirements, Clause 4, Section VI-B, Part 2,

Item	Description	Qty.	INR		JYP		EURO		USD	
			Unit Rate	Amount	Unit Rate	Amount	Unit Rate	Amount	Unit Rate	Amount
1	For a quarter- During DLP	8								
2	For a quarter- Post DLP	20								
	Total Cost									
BID TOTAL										
Equivalent Bid Total In Figures (in USD)										
Equivalent Bid Total In Words (IN US Dollars)										
Name of the Bidder										
Signature of the Bidder										

Notes:

1. Comprehensive Maintenance Service period is of two types; During DLP and post- DLP. Maintenance Services Clause 4 of Technical Specifications, Section VI-B, Part 2 defines the requirements in detail.

2. The price quoted for a quarter during DLP (even in extended DLP Period if any) shall be fixed and no Price variation is applicable on this.
 3. The price quoted for a quarter Post DLP shall correspond to the Base Date of the Contract (28 days prior to the latest Bid submission date). Actual payments shall be adjusted by Price Adjustment as per Appendix 2, Section IX, Part 3.
 4. The amount quoted in Schedule No. 8 for Comprehensive Maintenance Service and pro-rata calculated for an year without any adjustment shall not be less than the limits (percentage of the Contract Price (Part A) excluding the Price quoted for Mandatory spares) prescribed below:
 - a) During DLP (per year) – 3.0%
 - b) Post-DLP (per year) – 5.0%
 5. In case, ROD (Revenue Operation Date) occurs after the completion of DLP, the price quoted for 'during DLP' shall be payable till the ROD on pro-rata basis. 'Post-DLP' quoted rates shall become payable after completion of DLP or post-ROD whichever is later. The total period of Comprehensive Maintenance Service shall however remain fixed for 28 quarters.
 6. The quoted CMS price 'during DLP' shall not be more than 60% of the quoted CMS price 'post-DLP'.
-



Nonmaterial Deviations, Section IV-A, Bid Form 3 - Bidding Forms shall be quoted in this Schedule No. 9, clearly indicating the Schedule No. and Key date to which it will be allocated. The 'Lump Sum Price' quoted by the Bidder in 'BID TOTAL' in Grand Summary (Schedule No. 6) shall not include the Price for withdrawal of remark, comment, condition, qualifications or deviation etc. quoted in this Schedule No. 9. However, the Employer shall adjust the Bid Price by taking into consideration the nonmaterial nonconformities to evaluate the Bid Price (for comparison purpose only) of the Technical Bids which are substantially responsive.

3. In case price for unqualified withdrawal of any remark, comment, condition, qualification or deviation etc. indicated in Statement of Nonmaterial Deviations, Section IV-A, Bidding Form 3 is not quoted in Schedule No. 9, it shall be considered that the remark, comment, condition, qualification or deviation is unconditionally withdrawn without any financial implication. However, Employer at its sole discretion and option may assess the financial implication of the said remark, comment, condition, qualification or deviation etc. based on best engineering principles and concepts, which shall be binding on the bidder, and the same may be considered by Employer for financial evaluation.



Appendix A1: Mandatory Spares

S No.	Description	Unit	Qty	Unit Rate				Amount					
				INR	JPY	USD	EURO	INR	JPY	USD	EURO		
1	Set of side brushes with fixing rivet assy.	Set	2										
2	Brush fixing rivet assembly	Set	1										
3	Brush drives assy. & lower support complete.	Set	1										
4	Brush return cylinder assembly complete.	Set	1										
5	Drive motor for brushes	Set	1										
6	Pump for pre wetting, water brushing 1st & 2nd stage, 1st rinsing	Set	1										
7	Set of spray nozzles for all type of vertical brushes	Set	1										
8	Track, limit/proximity, Float, Level, Emergency, switches	Set	1										
9	All type of sensors for controls	Set	1										
10	Fuse & switchgears, contactors, relays, Isolators, timers, pressure switch.	Set	1										
11	Power supply, processor & module cards for the PLC system	Set	1										
12	Pneumatic valve	Set	1										
13	All operating consumables (detergents, salts, resins etc.) for washing of 2000 cars	LS	1										
Total Amount (to be carried forward to Schedule No 1 and/or Schedule No 2)													

Note:

1. "Set" is defined as quantity indicated above of each type of item required in the Wash Plant.
 Example: If there are 4 types of similar electric motors being used in the Wash Plant, then the set consists of one motor of each type.
2. Operating consumables are those items/ chemicals which are required for washing of trains and whose consumption is directly dependent on number of cars washed.
3. LS signifies Lumpsum.

----- End -----

BIDDING DOCUMENTS



MUMBAI METRO LINE 3 (COLABA-BANDRA-SEEPZ)

CONTRACT MM3-CBS-DEQ-9-02

Design, Manufacture, Supply, Installation, Testing, Commissioning
and Comprehensive Maintenance Service of
Automatic Train Wash Plant
for Project "Mumbai Metro Line-3"

Part 1

Bidding Procedure

Section V

Eligible Source Countries of Japanese ODA Loans

January – 2020

**Mumbai Metro Rail Corporation Ltd
MMRCL Line 3 Transit Office,
Wing A, Block E,
Bandra-Kurla Complex,
Bandra (East), Mumbai- 400 051, India.**



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Bidding Documents

Composition of Documents

Part 1	Bidding Procedure
Section I	Instructions to Bidders
Section II	Bid Data Sheet
Section III	Evaluation and Qualification Criteria
Section IV-A	Bidding Forms
Section IV-B	Pricing Document
Section V	Eligible Source Countries of Japanese ODA Loans
Part 2	Employer's Requirements
Section VI-A	Employer's Requirements – General Specifications
Section VI-B	Employer's Requirements – Technical Specifications
Part 3	Conditions of Contract and Contract Forms
Section VII	General Conditions of Contract (GCC)
Section VIII	Particular Conditions of Contract (PCC)
Section IX	Contract Forms
Section X	Conditions for Comprehensive Maintenance Service Contract
Part 4	Drawings
Section XI	List of Drawings



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Section V. Eligible Source Countries of Japanese ODA Loans

[All countries and Areas]

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BIDDING DOCUMENTS



MUMBAI METRO LINE 3 (COLABA-BANDRA-SEEPZ)

CONTRACT MM3-CBS-DEQ-9-02

Design, Manufacture, Supply, Installation, Testing, Commissioning
and Comprehensive Maintenance Service of
Automatic Train Wash Plant
for Project "Mumbai Metro Line-3"

PART 2 EMPLOYER'S REQUIREMENTS

Section VI-A General Specifications
Section VI-B Technical Specifications

January - 2020

**Mumbai Metro Rail Corporation Ltd
MMRC Line 3 Transit Office,
Wing 'A', 'E' Block,
Bandra-Kurla Complex,
Bandra (East), Mumbai 400 051, India**



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Bidding Documents Composition of Documents

PART 1	Bidding Procedure
Section I	Instructions to Bidders
Section II	Bid Data Sheet
Section III	Evaluation and Qualification Criteria
Section IV-A	Bidding Forms
Section IV-B	Pricing Document
Section V	Eligible Source Countries of Japanese ODA Loans
PART 2	Employer's Requirements
Section VI-A	Employer's Requirements – General Specifications
Section VI-B	Employer's Requirements – Technical Specifications
PART 3	Conditions of Contract and Contract Forms
Section VII	General Conditions of Contract (GCC)
Section VIII	Particular Conditions of contract (PCC)
Section IX	Contract Forms
Section X	Special Conditions for Comprehensive Maintenance Service Contract
PART 4	Drawings
Section XI	Drawings



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BIDDING DOCUMENTS



MUMBAI METRO LINE - 3 (COLABA-BANDRA-SEEPZ)

CONTRACT MM3-CBS-DEQ-9-02

Design, Manufacture, Supply, Installation, Testing, Commissioning
and Comprehensive Maintenance Service of
Automatic Train Wash Plant
for Project "Mumbai Metro Line-3"

Part 2

Employer's Requirements

Section VI-A

General Specifications

January – 2020

**Mumbai Metro Rail Corporation Ltd
MMRC Line 3 Transit Office,
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TABLE OF CONTENTS

CHAPTER 1	1
1 General Requirements	1
1.1 General	1
1.2 Power Supply	2
1.3 Climatic Conditions	2
1.4 Electromagnetic Compatibility (EMC)	3
1.5 Environmental Protection	3
1.6 Standards and Codes	3
1.7 Units	3
CHAPTER 2	4
2 Planning, Program and Progress Monitoring	4
2.1 Planning	4
2.2 Works Programme	4
2.3 Design Submission Programme	4
2.4 Manufacturing, Testing & Delivery Programme	4
2.5 Installation, Testing & Commissioning Programme	5
2.6 Training Programme	5
2.7 Interface Management Program	5
2.8 IT Requirement of Employer	5
2.9 Quarterly Progress Report	5
2.10 Meetings	5
2.11 Review Periods for Contractor's Submissions	6
2.12 Failure to make Submissions	6
2.13 Project Calendar	6
CHAPTER 3	7
3.0 Management Plans	7
3.1 General	7
3.2 Project Planning	7
3.3 Interface Management Plan	7
3.4 Design Plan	8
3.5 Safety Plan	8
3.6 Site Safety Plan	8
3.7 Manufacturing, Testing and Delivery Plan:	8
3.8 Installation, Testing & Commissioning Plan:	9
	iii



3.9 Defects Liability Plan:	9
CHAPTER 4	10
4. Interface Management	10
4.1 General	10
4.2 Contractor's Co-ordination Responsibilities	10
4.3 Interface Responsibilities	11
4.4 Interfacing Functions	12
4.5 Scope of Work of Interface Management Plan	12
4.6 Interface with Asset Management System (AMS) Contractor	13
4.7 Interface with Depot Detailed Design Consultants and Construction Contractor(s)	13
CHAPTER 5	14
5. Document Submission	14
5.1 General	14
5.2 Review of Data	15
5.3 Format of Deliverables	15
5.4 Number of Copies	15
5.5 Document Notification Codes	16
5.6 Project Manager's Review	16
5.7 As-Built/ Manufactured Drawings and Documents	17
5.8 Document Identification and Numbering	17
5.9 Structure of Handover Documentation	17
CHAPTER 6	18
6 Quality Management	18
6.1 Introduction	18
6.2 Quality Management System (QMS)	18
6.3 Quality System Requirements	18
CHAPTER 7	19
7 Software Quality Assurance	19
7.1 Application Software and Development Tools	19
7.2 Software Support	19
CHAPTER 8	20
8 Packaging, Storage, Shipping and Delivery	20
8.1 Storage	20
8.2 Packing, Crating & Markings	20
8.3 Shipping	21



8.4	Delivery	21
CHAPTER 9		22
9	Installation, Testing & Commissioning	22
9.1	General	22
9.2	Sequence of Tests	22
CHAPTER 10		23
10	Materials and Equipment	23
10.1	Materials	23
10.2	Equipment	23
CHAPTER 11		24
11	Training	24
11.1	Training Requirements	24
11.2	Training Objectives: Operations	24
11.3	Training Objectives: Maintenance	25
11.4	Training Methods	25
11.5	Training Records	25
CHAPTER 12		26
12	Operation & Maintenance Manuals	26
12.1	General	26
12.2	Operations	26
12.3	Maintenance	26
CHAPTER 13		27
13	Traffic, Road & Transportation to Site	27
13.1	General	27
13.2	Transportation to Site	27
CHAPTER 14		28
14	Supply of Spares, Special Tools and Test Equipment	28
14.1	General	28
14.2	Consumable Spares	28
14.3	Warranty	28
14.4	Purchase of Spares from Vendors	29
14.5	Commissioning Spares	29
14.6	List of Spares	29
CHAPTER 15		30
15	Work Site Management	30



15.1	Access to Site	30
15.2	Site Facilities	30
15.3	Site Management	31
15.3.1	The Contractor shall	31
15.4	Site Safety	31
	CHAPTER 16	33
16	Photographs and Public Relations	33
16.1	Progress Photographs	33
16.2	Public Relations	33
	CHAPTER 17	34
17	Temporary Electricity Supply	34
17.1	Electricity Supply for the Contractor by the Depot Civil Contractor	34
17.2	Work on Site	34
17.3	Inability to Supply	34
	APPENDIX 1- Key Dates	36
	APPENDIX 2- Definitions	38
	APPENDIX 3- Programs	39
	APPENDIX 4- Quarterly Progress Report	41
	APPENDIX 5- Interface Sheet	42
	APPENDIX 6- Drafting and CAD Standards	55
	APPENDIX 7- List of Deliverables by the Contractor	61
	APPENDIX 8- General Electrical Requirements	62
	APPENDIX 9- General Mechanical Requirements	65



CHAPTER 1

1 General Requirements

1.1 General

1.1.1 This Specification covers the general aspects of the Contract viz., description of the Works, Project Planning and Progress Monitoring, Management Plans, Interface Management, Document Submission, etc. amongst some other aspects. This General Specification shall be read in conjunction with Technical Specification, Section VI-B, Part 2 along with drawings and other Contract documents in Part 1 and Part 3.

1.1.2 Application of the General Specification (GS)

The provisions contained in the Technical Specifications and the Employer's Drawings shall prevail over the provisions contained in the General Specifications. These shall be read in conjunction with General Conditions of Contract (GC), Particular Conditions of Contract (PC), Technical Specifications, Instructions to Bidders and other Contract Documents.

1.1.3 Abbreviations & Definitions:

The abbreviations used in this General Specifications are given in Table-1 below. Definitions of terms specifically used in this Section are also given in Appendix 2.

TABLE 1- ABBREVIATIONS

Abbreviation	Description
AMS	Asset Management System
BIM	Building Information Modelling
BS	British Standard
CAD	Computer Aided Design and Drafting
CD	Compact Disc
CNC	Computer Numerical Control
CPM	Critical Path Method
DDC	Detail Design Consultants
EDMS	Employer's Data Management System
E&M	Electrical & Mechanical
EMC	Electro Magnetic Compatibility
EMI	Electro Magnetic Interference
ES	European Standard
FAT	Factory Acceptance Test
GC	General Consultants
GCIM	General Consultant Interface Manager (assigned by the PM)
IMP	Interface Management Plan
IP	Ingress Protection
IT	Information Technology
LAN	Local Area Network
LED	Light-Emitting Diode
NoNO	Notice of No Objection
OCC	Operational Control Center
OCS	Overhead Catenary System
OEM	Original Equipment Manufacturer



OHS&E	Operational Health, Safety & Environment
O&M	Operation and Maintenance
PDM	Precedence Diagramming Method
PM	Project Manager
QA	Quality Assurance
RS	Rolling Stock
SAT	Site Acceptance Test
SI	International System (of Measurement)
STPT	Signaling, Train Control, PSD and Telecommunication

1.1.4 Submission for Notice of No Objection

Documents, drawings, specifications and any other matters which have been given Notice of No Objection by the Project Manager shall not be changed without further submission and review by the Project Manager.

1.2 Power Supply

Traction: 25 kV, AC, 50 Hz single-phase traction power supply shall consist of Flexible Overhead Catenary System (FOCS) in the in the Depot yard, at the ramp to the tunnel and at Aarey JVLR Station. Rigid Overhead Catenary System (ROCS) shall be provided in the complete underground portion of 32.5 kms from Seepz to Cuffe Parade of Mumbai Metro Line 3 project.

Non-traction: 415 V, AC, 50 Hz, 3 phase, 3 core connection power supply shall be available for non-traction purposes in the Depot for operations of the Equipment. The Contractor shall design the Equipment such that it is capable of giving guaranteed performance within $\pm 10\%$ of voltage fluctuations. The Equipment installed shall not cause unbalance to the supply.

1.3 Climatic Conditions

The Equipment shall generally be required to work under the following climatic conditions:

Temperature

- a) Maximum temperature during summer : 45 degrees C
- b) Minimum temperature during winter : 8 degrees C
- c) Mean temperature : 33 degrees C
- d) Average daily range : 10 degrees C

Rainfall

- e) Average annual rainfall : 2200 mm
- f) During monsoon months (Jun-Sept) : 1450 mm
- g) Maximum rainfall : 900 mm per day

Humidity

- h) Maximum Relative humidity : 100 %
- i) Wind Load : 150 kg/ m²
- j) Water : Hard with high salt content

The above information shall be read as reference only. The Contractor shall check the prevailing climatic conditions from the websites (<http://www.wunderground.com>.) or the Regional Meteorological Centre of Mumbai) and design the Equipment on the most severe conditions with allowance for further extreme conditions.

As per the experience in India, high level of IP protection is required in order to ensure equipment reliability under the dusty climatic conditions prevalent in Mumbai area. The



Contractor shall also take into consideration the conditions in which the Facilities may be required to operate that may affect the operating environment in any way.

1.4 Electromagnetic Compatibility (EMC)

Some equipment is expected to work in close proximity of other systems like OCS, Signaling and Telecommunications, etc. The equipment shall not generate electromagnetic disturbances above levels that are appropriate for their intended place of use. In addition, the equipment shall have an adequate level of immunity to electromagnetic disturbances so that it can operate correctly in its intended environment. The equipment shall comply to IEC 61000 standard for EMC.

1.5 Environmental Protection

1.5.1 The Contractor shall conform and comply with the various Indian Environmental Laws and codes as applicable relating to Environment Protection, Air Pollution, Water Pollution, Noise Pollution, Hazardous Waste Disposal, etc. These include, but not limited to, the latest version of the following:

- a) Environment Protection Act, 1986
- b) Air (Prevention and Control of Pollution) Act, 1981
- c) Water (Prevention and Control of Pollution) Act, 1974
- d) The Noise Pollution (Regulation & Control) Rules, 2000
- e) The Hazardous Waste (Management & Handling) Rules, 1989

1.6 Standards and Codes

1.6.1 Unless otherwise stated in the Contract, reference in this Section to International Standards, European Standards, British Standards, British Standard Codes of Practice, Indian Standards and similar standards shall mean the latest edition of the document stated in the Technical Specifications, Section VI-B.

1.6.2 Plant & Equipment, related equipment and software shall be in accordance with the requirements of the standards and codes specified in the Employer's Requirements - Technical Specification. The Contractor may propose an alternative equivalent international standard or deviation from the specified standards during the design stage. The Contractor shall, in such a case, apply for a 'Notice of No Objection' or 'Notice of No Objection subject to ...' from the Project Manager. The Contractor shall state the exact nature of the change, the reason for making the change and relevant specifications of the materials and equipment.

1.6.3 Where no standard is identifiable, the Contractor shall make a proposal, based on the best International practice, which shall be subject to review by the Project Manager.

1.6.4 During the preliminary design phase, the Contractor shall submit a consolidated list of all the standards that he intends to use for the design, manufacturing and testing and other phases of the Contract, for review of the Project Manager.

1.7 Units

All drawings and design calculations submitted with the Bid, or in accordance with the requirements of the Contract, shall use SI units.

----- End of Chapter 1 -----



CHAPTER 2

2 Planning, Program and Progress Monitoring

2.1 Planning

- 2.1.1** The Contractor shall plan and provide programme which shall reflect the detailed planning undertaken which shall be realistic and achievable.
- 2.1.2** Key dates (as defined in Appendix 1) and Milestones shall be an integral part of the programme.
- 2.1.3** The Contractor shall monitor his own and his sub-Contractors' performance to ensure compliance with his obligations under the Contract.
- 2.1.4** The submissions of the plans shall comply with the requirements as given in Appendix 7- list of deliverables by the Contractor.
- 2.1.5** All programme submissions shall, unless otherwise specified, conform to the level of details specified in Appendix 3.

2.2 Works Programme

- 2.2.1** The Contractor shall prepare and submit his Works Programme within 28 days of the Effective Date giving information on the sequence and duration of activities that shall be adopted to achieve Key Dates of the Contract.
- 2.2.2** The Works Programme shall be divided into Sub-Programmes as follows:
- a) Design Submission Programme
 - b) Manufacturing, Testing and Delivery Programme
 - c) Installation, Testing & Commissioning Programme
 - d) Training Programme and
 - e) Interface Management Programme
- 2.2.3** All programmes shall be prepared using CPM scheduling software Primavera Project Planner (P6) programme or MS Project of the latest version.
- 2.2.4** All submissions made by the Contractor shall be properly co-ordinated taking care of due allowance for the Project Manager's review process to be undertaken, including the time needed for any re-submissions.
- 2.2.5** The planning unit for the duration of all programme activities shall be the day. Any activity having a duration of more than thirty (30) days shall be divided into sub-activities that shall not exceed 30 days.
- 2.2.6** A standard Gregorian calendar shall be used for planning and execution of the Works. The programmes shall take into consideration allowance for Public Holidays and non-work periods. If a Key Date falls on a Public Holiday (as declared by Government of Maharashtra) or a non-workday, it shall be effective the next working day.
- 2.2.7** All terminology, definitions and conventions shall be in accordance with BS 6079-2:2000 Project Management.

2.3 Design Submission Programme

- 2.3.1** The Contractor shall submit a Design Submission Programme to the Project Manager.

2.4 Manufacturing, Testing & Delivery Programme

- 2.4.1** The Contractor shall submit his Manufacturing, Testing & Delivery Programme that shall be consistent with the overall Works Programme. This shall include details of each sub-



activity, viz. procurement of major items, manufacturing, testing, Factory Acceptance Tests and delivery programme.

2.5 Installation, Testing & Commissioning Programme

2.5.1 The Installation, Testing & Commissioning Programme shall be submitted and shall include details of each sub-activity, viz, Installation, Testing & Commissioning etc.

2.5.2 The Programme shall include all tests which shall be carried out during Testing & Commissioning stage.

2.6 Training Programme

2.6.1 The Contractor shall submit a Training Programme covering all proposed formal training courses and delivery of the training equipment.

2.7 Interface Management Program

2.7.1 An Interface Management Programme shall be developed in accordance with the interface requirements of the Contract.

2.8 IT Requirement of Employer

2.8.1 Employer is in the process of implementing an Enterprise wide cloud-based IT project titled "Integrated Project Management Platform". The IT project envisages following application stack:

- a) Planning, Progress, Performance reporting and Scheduling services using Primavera Project Planner (P6) program or MS Project convertible to .MPX or .XML of the latest version
- b) Collaborative Document Control and Management Services (using Proliance and Bentley Project Wise)
- c) 3D Modelling through Revit and clash detection through Navis Works (BIM solution)
- d) Enterprise wide ERP implementation

2.8.2 The effective use of such IT platform requires availability of web-based system at the Contractor's location with certain definite user's rights. Data uploading by Contractor's trained staff is key to effective implementation of the IT system. The Bidders are required to consider in their proposal the cost of IT staff for document uploading.

2.8.3 In view of the above, the Contractor shall be required to:

- a) Upload of drawings / designs created by the Contractor as per the classification on the PMIS.
- b) Key Contract related communication and progress related data as per processes defined on PMIS.
- c) Provide 3D BIM modeling in Revit (Compatible with BIM system of the Project Manager) of the Facilities after finalization of the design for incorporation in the Depot BIM model. 3D model shall include foundation, trenches, cable ducts etc. associated with the Equipment. The Contractor shall obtain Project Manager's NoNO of the 3D BIM Model.

2.8.4 The Project Manager's IT Project Team and IT Implementation Agency shall render necessary assistance to the Contractor, to comply the software system requirement.

2.9 Quarterly Progress Report

The Contractor shall prepare Quarterly Progress reports, as detailed in Appendix 4, and shall regularly submit to the Project Manager.

2.10 Meetings

2.10.1 The Contractor or his representative shall participate in meetings as indicated below:

2.10.2 Initial Contract Meeting:



This meeting shall take place within twenty-one (21) days of the issue of Letter of Acceptance.

The agenda of the meeting shall include:

- a) Submission of guarantees, undertakings, insurance policies and certificates, etc.
- b) Planned activities for the first 30 and 60 days after Effective Date.
- c) Nomination of the key personnel for all coordination and compliance of the Contractual obligations.

2.10.3 Interim meetings during the execution of the Contract:

The Project Manager shall convene interim meetings, as and when required and considered necessary by either the Project Manager or the Contractor, to sort out issues relating to progress, interface and any outstanding issues.

The Project Manager shall record minutes of all meetings and distribute them within seven (7) days of the meeting. The Meetings will be chaired by the Project Manager.

2.11 Review Periods for Contractor's Submissions

2.11.1 The Project Manager shall review those Contractor's program submissions which require his acceptance and shall signify his acceptance or otherwise within 14 days. The Contractor shall, when required by the Project Manager, re-submit its programs within 14 days of receipt of the Project Manager's comments.

2.11.2 The Project Manager will endeavour to review and respond to the Contractor on the adequacy and acceptability of the Contractor's submissions and re-submissions as soon as reasonably possible, but the Contractor should always allow for a 14-day review period.

2.12 Failure to make Submissions

Failure of the Contractor to submit any program, or any required revisions thereto within the time limits stated shall be sufficient reason for certification that the Contractor is not performing the work required in a timely manner.

2.13 Project Calendar

2.13.1 Project Days shall be deemed to commence at 0001 hours on the morning of the day in question. Where reference is made to the completion of an activity or Milestone by a particular day, this shall mean by midnight of the day.

2.13.2 For Project purposes, the presentation shall be in "Day" units.

2.13.3 Quarterly periods shall be of 3 months duration and commencing from 1st January, 1st April, 1st July, and so on or any part of it.

----- End of Chapter 2 -----



CHAPTER 3

3.0 Management Plans

3.1 General

3.1.1 List of Plans: In order to ensure satisfactory execution of the Contract, completion of works within specified targets, and quality in design, manufacturing and execution of work, following Management Plans shall be developed during execution of the Contract. These Plans shall be developed and submitted by the Contractor for Project Manager's review and issue of Notice of No Objection by the PM:

- a) Phase 1 plans shall cover 'Design Plan', 'Interface Management Plan' and 'Safety Plan', and
- b) Phase 2 plans shall cover 'Manufacturing, Testing & Delivery Plan', 'Installation, Testing & Commissioning Plan', 'Site Safety Plan' and 'Defects Liability Plan'.

The plans shall collectively define and describe the Contractor's proposed methods and procedures to meet the requirements of the Technical Specification. The submissions of the plans shall comply with the requirements as given in Appendix 7- list of deliverables by the Contractor.

3.2 Project Planning

3.2.1 The Contractor shall submit the following information:

- a) The names, qualifications, experience and positions of key personnel as described in Section III, Clause 1.1.1.
- b) The Contractor shall nominate a suitably qualified and experienced English-speaking Project Manager from his staff to be the Contractor's Equipment Project Manager. The nominee shall be subject to acceptance of the Project Manager.
- c) The Contractor shall also nominate suitable Design Engineer for the design of the Equipment including the foundation design.
- d) To fulfil the Contractor's obligations during the Installation, Testing & Commissioning period, the Contractor shall nominate experienced Site Engineer and organize deployment before undertaking Installation, Testing & Commissioning in the Depot.
- e) The Contractor shall nominate a suitable Interface Manager for carrying out all interface work with the Interfacing Contractors.
- f) The Equipment Project Manager shall nominate a suitable experienced Maintenance Engineer for all maintenance work of the Equipment during DLP. The Maintenance Engineer shall coordinate with the Employer's nominated representative and provide guidance as may be required to carry out the scheduled and un-scheduled maintenance activities from time to time.

3.3 Interface Management Plan

3.3.1 The Contractor shall nominate a suitably qualified and experienced Engineer to be the Contractor's Interfacing Manager. He shall develop the Interface Management plan in accordance with the requirements of Chapter 4 of the Employer's Requirements-General Specification. He shall carry out the interfacing work with system wide Contractors and Depot Civil Contractor.



3.4 Design Plan

3.4.1 The Contractor shall submit the Equipment Design report including the following details and in accordance with the quality requirement stated in Chapter 6.

- Design criteria;
- Functions of each system, sub-system, equipment or other element within the overall design,
- Incorporate the Project Manager's suggestions and changes based on the Technical Specification and/or operational requirements.

3.4.2 The Contractor shall develop Preliminary design and later Final Design of the equipment and its related foundation (wherever applicable) with following details

- a) calculations and analyses are complete;
- b) Interfaces with those of Interfacing Contractors of the Employer shall be incorporated at this stage
- c) Software design and development if applicable shall also be carried out at this stage.

3.4.3 Manufacturing of the Equipment will be allowed to commence production only after receiving 'Notice of No Objection' of the Final Design of the equipment from the Project Manager.

3.5 Safety Plan

3.5.1 The Contractor's Safety Plan shall include Failure Modes, Effects and Criticality Analysis, Hazard Analysis and the production of a Reliability Critical Items List.

3.6 Site Safety Plan

3.6.1 The Contractor shall submit a Site Safety Plan which shall be prepared as per the requirements of Clause 15.4, Chapter 15, Section VI-A.

3.7 Manufacturing, Testing and Delivery Plan:

3.7.1 The Contractor shall prepare Manufacturing, Testing and Delivery Plan in accordance with the Key Dates of the Contract. This shall identify

- a) The interfacing or co-ordination required with the Contractor's other related plans,
- b) The purchasing of components/ sub-assemblies ensuring that they comply with the requirements of the Specifications.
- c) Inspection and Testing plan of incoming materials.
- d) Review of non-conforming material.
- e) The handling, storage, packaging, preservation and delivery of manufactured products.
- f) Manufacturing Testing Plan to manage and control any test and inspection activities prior to Factory Acceptance Test.
- g) Factory Acceptance Test Plan: The Contractor shall submit a comprehensive plan for the Factory Acceptance tests. This shall describe as to how the Contractor will plan, perform and document all inspections and tests that will be conducted to verify and validate the Works prior to the delivery at Site. This shall also include details of any tests constituting the Factory Acceptance Tests.

3.7.2 Once the Factory Acceptance Test is completed to the satisfaction of the Project Manager/Employer, a Notice of No Objection shall be given for shipment/ delivery to the Site.



3.8 Installation, Testing & Commissioning Plan:

3.8.1 The Contractor shall submit the Installation, Testing & Commissioning Plan in accordance with the requirements of Chapter 9.

3.8.2 This plan shall also include details on

- a) Commissioning Plan and Guarantee Testing.
- b) Service trial, Blank operation and performance checking is a part of Testing & Commissioning Plan.

3.9 Defects Liability Plan:

3.9.1 The Contractor shall submit a Defects Liability Plan which shall describe Contractor's methodologies to demonstrate management of effective working of the Equipment during Defect Liability Period including management of spares required during this period.

----- End of Chapter 3 -----



CHAPTER 4

4. Interface Management

4.1 General

4.1.1 The Contractor shall interface the Design, Manufacture, Supply, Installation and Commissioning, covering with that of other Contractors, principally the Contractors for the Interfacing Contracts. The Contractor shall keep the Project Manager fully informed in respect of such interfaces, such information being given to the Project Manager in a timely manner ensuring that the work of the Contractor, Interfacing Contractor and other Contractors is carried out as per the Key Dates.

4.1.2 The Equipment Project Manager will nominate a suitable person as Interface Manager who shall assume the primary role as Contractual focal-point between the various Interfacing Contractors and the Project Manager. The Interface Manager and other Interfacing Contractors shall advise the Project Manager, in advance, the dates for which it needs design interface information, manufacture interface information, supply of equipment, testing and commissioning from the other Interfacing Contractor's so that work is not delayed.

4.1.3 Major Interfacing Contractors for Equipment Contractor are (wherever applicable):

- a) Depot Civil Contractor
- b) Depot E&M Contractor
- c) Rolling Stock Contractor
- d) Track Contractor
- e) STPT Contractor

4.1.4 Other Contractors

Besides above there are several other Contractors who may need the information regarding the design features and other parameters of the Equipment(s). Their Contracts shall have the provisions to interface directly with Equipment Contractor for the exchange of information. Equipment Contractor shall do the required interface with them as and when required.

4.1.5 The Contractor shall at all times use his best endeavors to resolve all interfaces applicable to the Contract and shall be proactive in seeking out interface issues and their solutions.

4.2 Contractor's Co-ordination Responsibilities

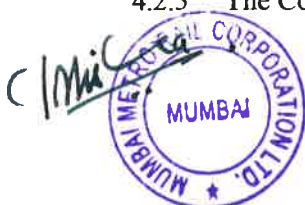
4.2.1 The Contractor shall co-ordinate with the PM and shall be required to attend meetings on issues appertaining to Government authorities and utility agencies regarding the services/facilities to be provided by them for the project.

4.2.2 The Master Interface Matrix (MIM), enclosed in Appendix 5, assigns the Contractor which has been designated as the Lead Party(s) for each interfacing Contractor. PM may update the MIM at any time to include additional Interfacing Contractors, and the Contractor's lump sum price shall be deemed to include any such additional works related to interfacing.

4.2.3 The lead Interfacing Contractor shall be responsible for administering, monitoring, managing, supervising and resolving all interface issues between all Interfacing Contractors.

4.2.4 In a situation where either the Lead Contract or the Interfacing Contract is yet to be awarded, the required co-ordination with the awarded Contract shall be done by the PM, with the express understanding that there may be changes as and when the other Contracts are awarded.

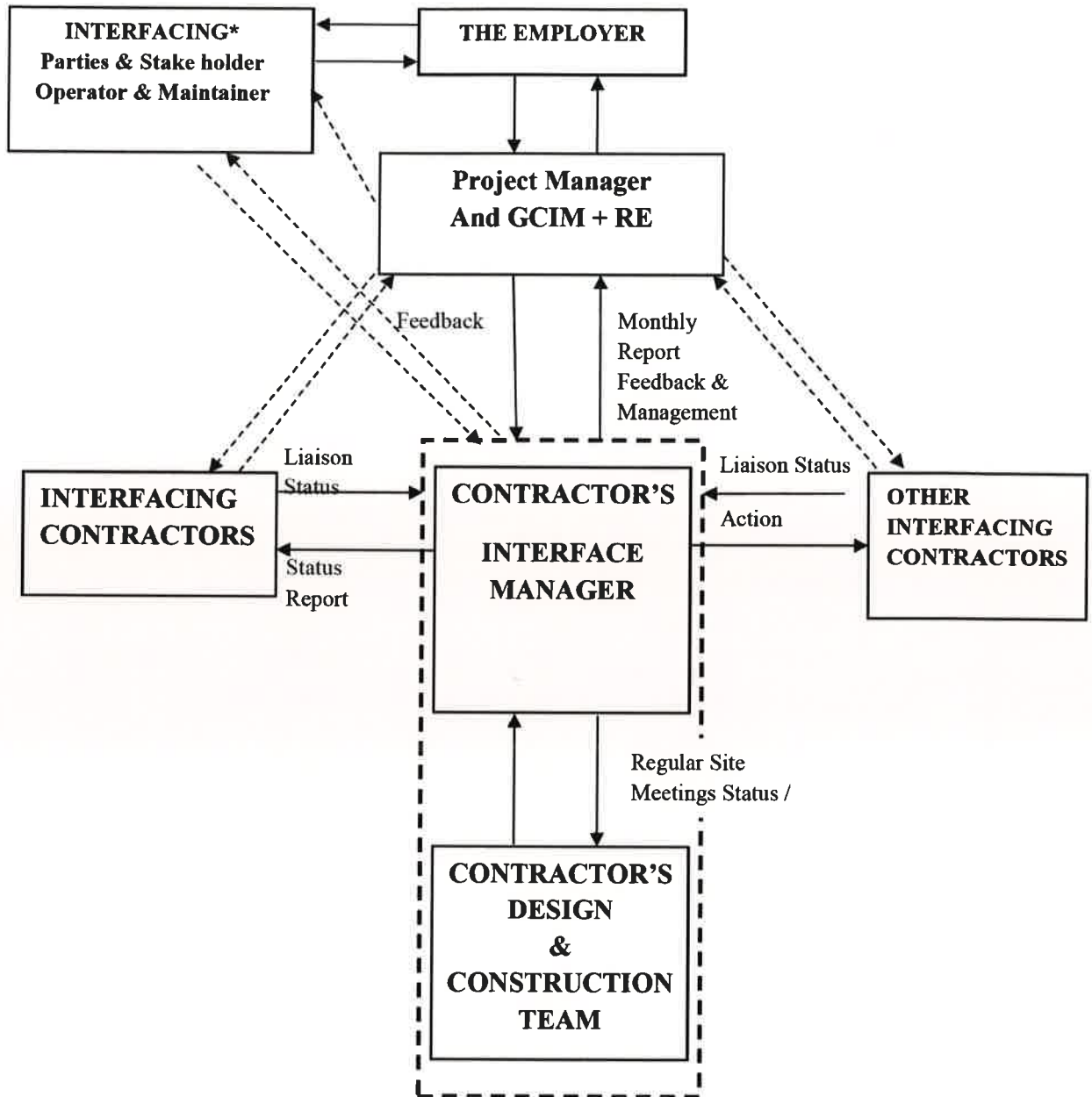
4.2.5 The Contractor shall ensure that all the Interface requirements are included in his Interface



Management Plan. Figure 1 gives a schematic presentation of the Interface Communication and Co-ordination processes between the various role-players in the Project.

Contractor's Organisation

Figure 1 – Interface Communication and Co-ordination Model



4.3 Interface Responsibilities

4.3.1 The interface responsibilities for Design, Manufacture, Supply, Installation, Testing & Commissioning including the Integrated Testing and Commissioning are tabulated, interface Contractor-wise, in Appendix 5.

4.3.2 This Appendix shall be read in conjunction with the relevant clauses of the Employer's Requirements including General Specifications and Technical Specifications. The Equipment Contractor shall be responsible for ensuring that all requirements of the



specifications pertaining to interfaces are satisfied.

4.3.3 The requirements specified herein are by no means exhaustive and it remains the Contractor's responsibility to develop and execute jointly an Interface Plan after the commencement of the works and throughout the execution of works, to ensure that:

- a) all interfacing issues between the two Contractors are satisfactorily resolved;
- b) supply, installation and testing of equipment and software are fully coordinated; and
- c) that all equipment supplied under the Contracts are fully compatible with each other, whilst meeting the requirements of the respective Specifications.

4.3.4 The Interface Management Plan (IMP) shall be submitted to Project Manager for review and comments. Project Manager will play a lead role in ensuring that the Interfacing Contractors perform in a timely and cooperative manner.

4.3.5 The IMP shall be updated by the Contractor, as and when needed, and submitted to the Project Manager. Should it appear to Project Manager that the progress of the Works does not conform with the IMP, the Contractor shall be required to revise all such programs and plans such that they do reflect that the progress of the Works is mutually consistent and conforms to other provisions of the Contract.

4.3.6 The Contractor shall review the details of interface works and notify the Project Manager of any amendments to the interface sheets required in the process of its works. Unless such requests are reviewed without objection by the Project Manager, the Equipment Contractor shall design and construct the works in accordance with the provisions outlined in this the attached interface sheets.

4.4 Interfacing Functions

The Interfacing Contractors are responsible for, but not limited to, the following;

- a) Preparing the Interface Management Plan and subsequent procedures;
- b) Preparing their Interface Co-ordination Sheets (ICS) and Interface Specifications and issuing same to the relevant Interface Contractors and PM;
- c) Co-ordinating with the relevant Interface Contractors to establish coordinated Combined Services Drawings (CSD) & Structural, Electrical and Mechanical (SEM) Drawings;
- d) Updating their ICS from time to time and submit the same to the PM for review.

4.5 Scope of Work of Interface Management Plan

4.5.1 The information and scope of works to be provided by the Equipment Contractor include but may not necessarily be limited to those outlined in the attached interface sheets.

4.5.2 The Interfacing Contractors shall liaison with the Equipment Contractor in the Design, Installation, Commissioning, Testing and Acceptance of the Equipment Works.

4.5.3 The Contractor shall provide all access and attendance necessary in accordance with the Contract requirements to enable the Interfacing Contractors to complete those activities defined under the interface sheets attached to this interface specification in a timely manner.

4.5.4 Where Equipment Contractor works are identified as failing to meet the requirements of the Contract and which will impact the Interfacing Contractor's works, the Equipment Contractor shall submit the proposed remedial measures to the Project Manager for review and shall copy the same to the Interfacing Contractors.



4.6 Interface with Asset Management System (AMS) Contractor

- 4.6.1 The Employer has plans to implement state-of-the-art IT-based Asset Management System (AMS), which shall enable it to manage and optimize various processes (viz. maintenance management, engineering management, O&M relationship management, supply chain management, reporting, etc.)
- 4.6.2 The Equipment Contractor shall be required to coordinate and interface with AMS Contractor for successful integration of Assets into the Asset Management System.
- 4.6.3 The Equipment to the required levels of breakdown shall be entered into the AMS.
- 4.6.4 The Equipment data shall be fed into the AMS broadly in three forms:
- (a) Predetermined set of active failure rules shall be transmitted to OCC. AMS shall be able to take in this data for processing.
 - (b) Data shall be downloaded from Control Console of the Equipment through GPRS or WLAN at predetermined intervals or locations. AMS shall be capable of interfacing with the concerned database and take in filtered data as per design.
 - (c) Other data will be fed manually in the AMS.
- 4.6.5 Preventive and corrective maintenance data generated by the Control Console of each Equipment to be captured to raise the work request /work orders, and to update the equipment data.
- 4.6.6 The point of interface to the AMS will be the AMS depot (or other location) rack via Ethernet LAN connectivity.
- 4.7 Interface with Depot Detailed Design Consultants and Construction Contractor(s)**
- 4.7.1 The Project Manager with experience and help of Detail Design Consultants (DDC) will design the facilities in depots and workshops. This interface is to improve it further to meet the requirements.
- 4.7.2 In order to perform the work, the Contractor will be required to communicate directly with Project Manager. The Project Manager will record the details of all these meetings and provide a copy to Project Manager. The Contractor will also give the notice for meetings with sufficient time to enable Project Manager to attend these meetings.
- 4.7.3 Project Manager will provide the Contractor with authorization; assistance and the support of its own personnel should the Contractor request Project Manager to intervene on its behalf with such meetings.

----- End of Chapter 4 -----



CHAPTER 5

5. Document Submission

5.1 General

5.1.1 Copies of correspondence relevant to the execution of the Works and not of a confidential nature received from or dispatched to Government departments, utility undertakings and Project Contractors employed by the Employer shall be submitted to the PM for information as soon as possible and in any case not later than 3 days after issuing date of the document.

The Contractor shall supply for the PM's information, comment and notice of no objection all documentation required for the procurement, design, manufacture, certification, testing, installation, training, maintenance and operation of the Works.

5.1.2 All submissions shall be made to the PM in a format which has Notice of No Objection by the PM and in accordance with the requirements in:

- a) the Contract;
- b) the Drafting and CAD Standards -Appendix 6, Drafting and CAD Standards and
- c) Unless otherwise stated herein all documents shall, as a minimum, be produced in accordance with the following requirements:
 - i) All documentation shall be submitted in the English language using SI Units
 - ii) All documentation presented as print material shall use paper of suitable quality for a retention time under conditions of normal usage and storage for a minimum period of 10 years without deterioration or fading.
 - iii) Documentation provided on DVD, electronic media shall allow archiving, storage, retrieval, amendment and printing out.
 - iv) All documentation shall be produced with a suitable indexing and document numbering system to be agreed with the Employer and compatible with Employer's Data Management System (EDMS).

5.1.3 All designs specifically produced for this Contract shall become the property of the Employer and shall be clearly identified as such on all documents.

5.1.4 Drawing Practice and Symbols:

- a) Except as otherwise agreed with the Employer, documentation shall be produced by the Contractor in the following sizes in accordance with BS /EN / ISO 5457:
 - i) Drawings sizes shall generally be A1, A2 or A3. All drawings shall be capable of being photo reduced in a legible form to A3 size, sketches may be submitted in A4 size.
 - ii) Other documents shall be A3 or A4 size with associated drawings within the document provided as A3 sized documents, for A4 sized documents associated drawings shall be A4 or A3 folded to A4.
- b) Graphical symbols shall follow established international conventions and standards such as IEC 60417 and ISO 7000.
- c) Documentation shall conform to standards such as BS8888, 'Technical Product Specification', and current version.
- d) Drawings shall be fully labelled with cross-referencing data between drawing sheets, where necessary, to permit ease of use.



5.1.5 Document format:

- a) The Contractor shall use suitable, compatible, industry standard software packages in the preparation of documentation for submission to the PM.
- b) The following software which shall be compatible with the Employer's Requirement and also with Intel-Windows based computers shall be used, unless otherwise stated, for the various electronic submissions required:
 - Text Documents MS Word
 - Spread Sheets MS Excel
 - Data Base Files MS Access
 - Presentation Files MS Power Point
 - Programs Primavera P6 or MS Project
 - Drawings Auto CAD
 - Photographic Files Adobe Photo Shop
 - Project Management MS Project

5.1.6 The objective of the design submission process is to ensure that the proposed resulting works comply with the specifications, are capable of being produced consistently to exacting quality standards and can be operated safely to the satisfaction of the Project Manager.

5.1.7 The design submissions include Design Calculations, Design Reports and Design Drawings.

5.1.8 In the event that a statutory body (e.g. Government of India Ministry of Railways, Research, Design, Standards Organization (RDSO), Commissioner of Railway Safety, etc.) requires design information in a particular format, it shall be incumbent upon the Contractor to provide the same, as directed by the Project Manager.

5.2 Review of Data

5.2.1 As soon as practicable after the award of the Contract, the Contractor shall review all applicable data, criteria, standards, directives and information provided to him as the basis for design. Any apparent inconsistencies or erroneous information shall be brought to the attention of the Project Manager. Such information shall not alleviate the Contractor from its responsibilities under the Contract.

5.3 Format of Deliverables

5.3.1 Drawings and CAD data shall comply with the requirements of Appendix 6 of this General Specification: Drawing and CAD Standards. Reports, calculations, specifications, technical data and similar documents shall be provided in A4 format, and one of the copies shall be ring bound to facilitate photocopying. A3 size drawings included in documents shall be folded to A4 size.

5.4 Number of Copies

Unless otherwise mentioned specially elsewhere, the Contractor shall submit the following quantities of drawings and other documents to the Project Manager, including preliminary, pre-final, and final design submissions, the final Contract document, and all other submissions. These drawings and documents are in addition to those required for the exchange of information between Interfacing Contractors and other submissions to statutory, governmental and local authorities.

- a) Full size Paper drawings (folded and collated)- 4 sets
- b) Design documents and calculations- 3 sets.
- c) Design Status Report and Design Statement- 3 sets.
- d) All other submissions- 3 sets.



- e) Each of the above in electronic format.

5.5 Document Notification Codes

5.5.1 Each document submitted by the Contractor shall use Document Submission Cover sheet or have an Acceptance Block with a minimum size of 100 mm x 75 mm which shall be located as detailed below:

- a) For Documents in the center of the front page
- b) For Drawings in the lower right-hand side of the front sheet
- c) With a space for the Notice of No Objection Signature of the PM together with his Name and Date of signature.

5.6 Project Manager's Review

The PM will respond to the Contractor by issuing a Document Submission Report (DSR) indicating notification in one of the following three ways:

DRAWING/DOCUMENT SUBMISSION REPORT			
CODE	STATUS		COMMENT
'A'	Objection		Complete re-submission required
'B'	No Objection with comments		Incorporate All Comments - & re-submit Documents
'C'	No Objection		Notice of No Objection
Signature:		Print Name:	Date:

- a) Issue of a Notice of "No Objection", status code 'C', entitles the Contractor to proceed to the next stage of the programme of work. Receipt of such notice of no objection does not in any way remove any responsibility from the Contractor for complying with the Contract.
- b) If the PM discovers minor non-compliance, discrepancies, omissions, etc. that, in his opinion, are not of a fundamental nature, he will return the completed Document Submission Report (DSR) – Status Sheet with the status code 'B' checked as 'No Objection with comments' with a Document Submission Report (DSR) – Comment Sheet containing a listing of the Employer's Requirements Comments and area of deficiency which are required to be amended, included or improved to comply with the Contract. Issue of a 'No Objection with comments' entitles the Contractor to proceed to the next stage of the programme of work, subject to the required amendments of documents where by the PM's comments are taken into account fully and implemented exactly.
- c) If the PM discovers major non-compliance, discrepancies, omissions, etc. that, in his opinion, are of a fundamental nature, he may return the Document Submission Report (DSR) – Status Sheet with the status code 'A' checked 'Objection. A complete resubmission is required' with a Document Submission Report (DSR) – Comment Sheet containing a listing of the PM Comments and area of deficiency which are required to be amended, included or improved to comply with requirements of the Contract. The issuance of an 'Objection. A complete resubmission is required' does not entitle the Contractor to proceed to the next stage of the programme of work until it is entirely resubmitted in a proper way and all of the PM's comments are fully taken into account and a satisfactory re-submission has been made (i.e. one which results in a code 'B' 'No Objection with comments' or code 'C' 'Notice of no objection').

5.6.1 The Project Manager will complete his review of the submission within 14 calendar days, after which the review comments in writing or on marked up drawings and specifications



will be furnished to the Contractor. Within two weeks of the receipt of the Project Manager's comments, the Contractor shall submit its proposals for implementation in the next submission. Where the comments are minor, such proposals may be clarified by calculations, part prints, etc. acceptable to the Project Manager and included in the Contractor's next submission. Should the Project Manager deem the submission to be unacceptable, the Contractor shall revise and resubmit the entire submission within two weeks, unless otherwise agreed with the Project Manager.

- 5.6.2 After Project Manager's review of the design submissions, the Contractor shall update the documentation incorporating Project Manager's observations and also other design requirements. For all subsequent submissions, the Contractor shall demonstrate that all the previous comments by Project Manager has been incorporated. The comments previously issued by Project Manager shall also become part of the submission.

5.7 As-Built/ Manufactured Drawings and Documents

- 5.7.1 As-built drawings are intended to show the works exactly as constructed. These are prepared by amending the manufacturing drawings to take into consideration changes necessitated by manufacturing methodology. These drawings shall be completed and submitted to the Project Manager before completion of Installation, Testing & Commissioning.

5.8 Document Identification and Numbering

- 5.8.1 The Contractor shall follow the project-wide Document Identification and Numbering Procedure of the Employer.

- 5.8.2 This Procedure is applicable for all documents, including but not limited to the following:

- Correspondences and Letters.
- Documents- Internal and external.
- Reports.
- Method Statements.
- Drawings.
- Manuals.
- Procedures.

- 5.8.3 The Contractor shall co-ordinate with the Document Controller of the Project Manager and shall take from him the details of the Numbering System to be followed with the Project Manager.

5.9 Structure of Handover Documentation

- 5.9.1 The Contractor shall provide the following documentation on handover of the system to the PM:

- a. As-Built Drawings and Documents
- b. Full Asset Register
- c. Licenses and Warranties
- d. Material Certification File
- e. Operations & Maintenance Manual
- f. Operator's Handbook
- g. Training Manual
- h. Spares Parts List (Including Illustrated Parts Catalogue)



----- End of Chapter 5 -----

CHAPTER 6

6 Quality Management

6.1 Introduction

- 6.1.1 The Contractor shall maintain and implement a Quality Management System, based on International Standard ISO 9001: 2015.
- 6.1.2 Sub-Contractors of all critical components shall also be covered by the Contractor's Quality Management System ISO 9001:2015.
- 6.1.3 The Contractor shall, for the PM/ Employer's Inspection, Verification and /or Test and Commissioning, provide:
- a) Right to inspect;
 - b) Facilities to carry-out the inspection of their work; and
 - c) Assistance in travel and accommodation arrangements

6.2 Quality Management System (QMS)

- 6.2.1 The Contractor shall designate an experienced Quality Manager who shall be responsible for overseeing the implementation of all quality checks of the Contractor.
- 6.2.2 The Contractor shall plan, perform and record all quality control activities to ensure that all work is performed in accordance with the requirements of the Contract and of his Quality Management System.
- 6.2.3 The Contractor shall designate all Quality 'Hold Points' into the Contractor's Inspection Testing and commissioning activities and include the same in the Quality Plan.
- 6.2.4 All non-conformances are to be documented and resolved, before final acceptance of the Works or any part of it.
- 6.2.5 The Contractor shall make available for audit all records necessary to demonstrate that the Works have been executed in accordance with the Contract. They shall also provide the PM with documents that demonstrate that the Works are progressing in accordance with the specified requirements.
- 6.2.6 The Contractor shall submit its QMS to Project Manager and obtain PM's NoNO. The QMS shall identify its Quality Procedures, the Management Structure of Quality organization, Process Flowchart, detection and dealing with non-conformities, etc. covering the entire scope of his Works in the Contract. The QMS shall include the stages of Design, Manufacturing, Installation, Testing & Commissioning and Maintenance during- and post-DLP. It shall also detail the inspection and test details of the critical components and the Equipment itself.

6.3 Quality System Requirements

- 6.3.1 All testing in India is to be carried out by laboratories accredited by NABL (National Accreditation Board of Testing and Calibration Laboratories) or internationally by accredited laboratory complaint to ISO 17025: 2005. Alternatively, PM's NoNO shall be taken for getting the tests conducted elsewhere.
- 6.3.2 All testing of systems, software, plant and materials must be carried-out by persons qualified to meet the requirements and Standards.

----- End of Chapter 6 -----



CHAPTER 7

7 Software Quality Assurance

7.1 Application Software and Development Tools

7.1.1 The staff of the Employer/ Project Manager shall be given the required training by the Contractor and made conversant with the software and other related issues as found necessary during the Contract execution.

7.1.2 All software(s), irrespective of Contractor's own software or of sub-suppliers, shall be compatible with latest version of Windows Operating software/ applicable software system and shall also have upward compatibility. In case, the compatibility of installed software(s) with latest version of Windows/applicable software system is not available, the Contractor shall replace the installed software(s) without downgrading the Equipment performance. Contractor shall commit to support and supply free of cost any special hardware /software required for ensuring compatibility with new version of Windows/ applicable software system till the completion of the Contract.

7.1.3 Beyond the completion of the Contract, in case of obsolescence of the application software, suitable alternatives solutions shall be implemented (at mutually agreed terms and conditions) and full support shall be provided by the Contractor.

7.1.4 Diagnostic tools provided shall include all hardware / software required for the purpose of:

- a) Uploading / downloading of all software used in the Equipment / system / sub-systems.
- b) Downloading of faults and any other information required for trouble shooting and diagnostic purpose.
- c) Data analysis and investigation tools of real-time downloads on central computer.

7.2 Software Support

7.2.1 The Contractor shall provide all tools, equipment, manuals and training as necessary for the Employer / PM to use, maintain and re-configure the software provided under the Contract.

7.2.2 The Contractor shall submit all new versions of the software to the PM/ Employer at least 2 weeks prior to their installation. New Versions of any program shall not result in any non-conformance with the Specification or degrade the operation of the System. The Contractor shall:

- a) ensure that all new versions are fully tested and validated on the simulation and development system prior to installation.
- b) ensure that all new versions are fully tested and commissioned once installed on the Site.

7.2.3 Within 14 days of the installation of any software into the Permanent Works by the Contractor, the Contractor shall submit to the PM for retention by the Employer, two backup copies of the software, which shall include, all licenses, where applicable, in favour of the Employer for their use.

7.2.4 The Contractor shall submit a list of all software with version number indicating the source/ownership of the software.

----- End of Chapter 7 -----



CHAPTER 8

8 Packaging, Storage, Shipping and Delivery

8.1 Storage

8.1.1 The Contractor shall prepare, protect and store, in a manner to be accepted by the Project Manager, all equipment and materials so as to safeguard them against loss or damage from repeated handling, from climatic influences and from all other hazards arising during shipment or storage on or off the Site.

8.1.2 Secure and covered storage shall be provided at Site for all equipment and materials other than those accepted by the Project Manager as suitable for open storage.

8.2 Packing, Crating & Markings

8.2.1 The Contractor shall provide all packing, crating and markings.

8.2.2 Each case, crate or package shall be waterproof, rot-proof and insect/rodent proof and of robust construction.

8.2.3 Each case, crate or package shall be legibly and indelibly marked in large letters with the Site address, Contract number, "right way up", opening points and other markings as necessary to permit materials to be readily identified and handled during transit.

8.2.4 All packing procedures shall be subject to acceptance by the Project Manager. These procedures shall be detailed in the Delivery Plan.

8.2.5 Appropriate spare parts shall be tropicalized in their packing for prolonged storage in accordance with BS 1133 or equivalent and shall be suitably labelled to indicate:

- Ownership (MMRC)
- Shelf life
- Type of storage
- Description of item and relevant part number
- Serial number, if applicable
- Inspection Certificate number and batch number, that is, the number allocated by the Contractor's Inspector at the time of manufacture or packing

8.2.6 Protection requirements shall include but not be limited to:

- Electrical and other delicate items or equipment shall be properly protected.
- Tube ends, cable ends, cable entry points into equipment and other similar terminations and openings shall be blanked off to prevent ingress of dirt, moisture, vermin or insects and to provide protection against damage.
- Flanged ends shall be protected by adhesive tape or jointing material covered by a properly secured wooden blank not smaller than the flange itself. Plain tube ends shall be closed off with bungs or plugs or suitable materials firmly fixed in position.
- Particular care shall be taken to prevent damage to or corrosion of shafts and journals where they rest on timber or other supports, which may contain moisture. At such points, wrappings impregnated with anti-rusting composition shall be used. Wrapping shall be of sufficient strength to resist chafing under the pressures and movements likely to occur in transit.
- Spare ball and roller bearings and similarly protected items shall not be removed from the manufacturer's wrappings or packing.

8.2.7 Each case, crate or package shall contain a comprehensive packing list showing the contents with details of item number, mark, size and weight. A second copy of the packing list shall



- be enclosed in a watertight enclosure on the outside of each case.
- 8.2.8 All cases/ crates heavier than 100 kg shall be marked on the outside of the case to show the gross weight, the points for slinging, and where the weight is bearing.
- 8.2.9 Care shall be taken to prevent movement of contents within cases/ crates by the provision of bracings, straps and securing bolts as necessary. Bags of loose items shall be packed in cases and shall be clearly identified by well-secured labels on which the quantity and name of the part and its index or catalogue number have been stamped.
- 8.2.10 If sea transportation of Machinery and Plants from manufacturer's works to site at Mumbai is required, seaworthy packing/ treatment of Machinery and Plants shall be carried out for the safe transportation of Machinery and Plants. It shall apply to sea transportation of spares and other materials also.

8.3 Shipping

- 8.3.1 The Contractor shall notify the Project Manager fourteen (14) days in advance of any expected shipment date and give further notification of the actual shipment date and routing when such information is subsequently established.
- 8.3.2 (Two) copies of packing list and test certificates shall be delivered along with the package at site and one copy shall be despatched to the Project Manager.
- 8.3.3 Without prejudice to any other provisions of the Contract, the Contractor shall be responsible for all legal requirements, dues, taxes and other such requirements including all expenses in connection with this.

8.4 Delivery

- 8.4.1 The Contractor shall be responsible for transporting safely all equipment from the unloading point to the delivery point at Site through the streets of Mumbai, complying with all traffic rules and regulations. Obtaining necessary permission from the Traffic Police in this regard shall be the responsibility of the Contractor.
- 8.4.2 The Contractor shall unload the Works and all items to be supplied under the Contract at the designated delivery point and positioning or storing them.
- 8.4.3 Any part of the Works or any item to be supplied under the Contract that is damaged in transit shall not be considered as delivered until repairs or replacements have been made and all necessary spare parts or items have been delivered to the Site.
- 8.4.4 The Contractor shall store and secure the Works, equipment, spare parts and other items until the same have been inspected and are considered delivered at the designated point by the PM.
- 8.4.5 The Contractor shall remove temporary fittings required for shipment and re-assembly of equipment and shall complete this prior to the Equipment or parts thereof being inspected and before they are considered delivered.
- 8.4.6 An item shall be considered delivered when all damages have been repaired and all documentation including post-delivery preparation have been completed to the satisfaction of the PM.

— End of Chapter 8 —



CHAPTER 9

9 Installation, Testing & Commissioning

9.1 General

9.1.1 The Installation, Testing & Commissioning Plan shall contain, but not limited to, the following topics:

- a) the Contractor's methodology for installation, testing & commissioning;
- b) the interdependency and inter-relationship with Interfacing Contractors and their commissioning program;
- c) the objectives of each test and criteria for successful tests;
- d) documentation for conducting tests and submission of Testing & Commissioning procedures.

9.1.2 The Project Manager will then check the Plan to see whether it meets the requirements. The Project Manager shall inform the Contractor in writing within 14 days period after receipt of the above information:

- a) that the Contractor's proposed methods of inspection, testing & commissioning (including Integrated Testing and Commissioning) have the consent of the Project Manager; or
- b) in what respects, in the opinion of the Project Manager, the Contractor's proposed methods, etc. fail to comply with the Employer's Requirements and/or the Final Design Document, and
- c) would be detrimental to the Works and/or to the other works comprising the Project; and
- d) do not comply with the other requirements of the Contract; or

9.1.3 In the event that the Project Manager does not give his consent, the Contractor shall take such steps or make such changes in the said methods or supply such further documents or information as may be necessary to meet the Project Manager's requirements and to obtain his consent. The Contractor shall not change the methods of inspection, testing & commissioning which have received the Project Manager's consent without further review and consent in writing of the Project Manager.

9.1.4 Notwithstanding the foregoing provisions of this Clause, or that certain of the Contractor's proposed methods of inspection, etc. may be the subject of the consent of the Project Manager, the Contractor shall not be relieved of any liability or obligation under the Contract.

9.2 Sequence of Tests

9.2.1 The sequence of tests shall be:

- a) Stage Inspection at Manufacturing Stage.
- b) Factory Acceptance Tests (FAT) prior to dispatch.
- c) Open Package inspection on receipt of Equipment at Site
- d) Installation, Testing & Commissioning in Depot.
- e) Final Site Acceptance Tests (SAT).

9.2.2 All the facilities required for carrying out the FAT, should be available at the Manufacturer's premises and will have to be extended to the Inspection team during Factory Acceptance Tests.

9.2.3 All additional facilities required for carrying out the SAT, except Rolling Stock or Rolling Stock Components, should be arranged by the Contractor, at his own costs.

----- End of Chapter 9 -----



CHAPTER 10

10 Materials and Equipment

10.1 Materials

10.1.1 General

- a) Materials for inclusion into the Works shall be new unless otherwise stated in the Contract or having been given a Notice of No Objection by the Project Manager.
- b) Certificates of tests by manufacturers, which are submitted to the Project Manager, shall relate to the material delivered to the Site. Certified true copies of certificates may be submitted if the original certificates cannot be obtained from the manufacturer. A letter from the supplier stating that the certificates relate to the material delivered to the Site shall be submitted with the certificates.
- c) General Requirement for Electrical & Mechanical component/parts is detailed in Appendix 8 & Appendix 9.

10.2 Equipment

10.2.1 Equipment Protection

All equipment shall be capable of continuous operation, without the need of air conditioning or forced cooling, at the extremes of environmental conditions likely to be encountered. The Contractor shall be responsible for ensuring that his equipment and systems are not adversely affected by the modified environmental conditions caused by the localised heat or vapour emissions or moisture of other adjacent equipment whether provided under the Contract or otherwise.

----- End of Chapter 10 -----



CHAPTER 11

11 Training

11.1 Training Requirements

- 11.1.1 The Contractor shall provide comprehensive training to the Employer's staff to enable safe and efficient Operation and Maintenance of the Equipment supplied as part of the Contract to achieve maximum reliability and economy of cost.
- 11.1.2 The Contractor shall provide five (05) coloured copies and one soft copy (.pdf on CD) of the Training Manual for use by the Employer for conducting in-house training.
- 11.1.3 The Training Manual shall include, but not limited to, the following aspects of Equipment operation and maintenance:
- Schedule of training courses.
 - Objective, syllabus, format, class size and duration of each course and training evaluation methods.
 - Training facilities to be provided by the Employer.
 - On-Site training during Installation, Testing & Commissioning
 - Instructor's qualifications
 - Operation and procedures under normal and degraded modes of the Equipment.
- 11.1.4 The training syllabus should concentrate on familiarisation with various systems of the Equipment along with hands-on-training.
- 11.1.5 Training Instructors provided by the Contractor shall be fully qualified and experienced engineers and experts in the relevant field with experience in imparting training to Engineers and Technicians to the level of competency essential for Operation and Maintenance of the Equipment of similar specifications. The Instructors shall be English speaking and preferably having some knowledge of Hindi. The appointment of Instructors shall be confirmed only after its detailed curriculum vitae have been accepted by the Project Manager. In the event that an Instructor is subsequently deemed not to be competent, he shall be replaced forthwith.
- 11.1.6 The Contractor is required to provide at its own cost, all other necessary training aids such as written and printed notes, video programs, models, drawings, e-learning modules, CDs and other training aids. Training course notes shall be entirely compatible and where appropriate, cross referenced to the manuals supplied by the Contractor as part of the Operation and maintenance documentation.
- 11.1.7 Facilities such as classrooms complete with furniture, electric points etc, will be made available by the Employer free of cost to the Contractor for imparting training post- DLP.
- 11.1.8 All expenses of trainers, including travel and lodging, shall be borne by the Contractor. The cost of training material to trainees shall also be borne by the Contractor.
- 11.1.9 Any gadget, e.g. laptop, projector etc., needed for the training shall be arranged by the Contractor. Onsite training will be done on the commissioned Equipment.

11.2 Training Objectives: Operations

- 11.2.1 The operation training shall cover all operation aspects of the Equipment covering –
- Full features of operation,
 - Safety features,
 - Faults diagnosis and measures to rectify the Equipment.



11.2.2 After classroom training, the operating staff is required to be trained in actual operation of the Equipment for a sufficient duration to acquire the required confidence in operation in the Metro Depot.

11.3 Training Objectives: Maintenance:

11.3.1 The objective of training of maintenance staff is that the maintainers should be able to maintain the Equipment safely under all operating conditions and failure modes.

11.3.2 The training shall consist of classroom training and practical hands on training. The Contractor shall depute competent trainers to impart training to a high degree of proficiency with competency certificate issued by OEM. During the Defect Liability Period when the Contractor is responsible for fault finding and repairs, he shall provide practical hands on training to the Employer's maintenance staff.

11.3.3 The training in maintenance of the Equipment shall enable the engineers, inspectors and staff to achieve the following broad objectives:

- a) Full understanding of all aspects of the system design and functions of all the equipment including proprietary and sub-Contractor's equipment, software, etc.
- b) All planned maintenance and overhaul of the systems and equipment supplied, installed or modified under the Contract.
- c) Fault finding and rectification techniques for the systems and equipment supplied (by use of special test equipment, if required), installed or modified under the Contract. These shall be developed from the Contractor's previous experience with similar equipment and also from the fault tree analysis and other analyses carried out as part of the reliability engineering studies undertaken by the Contractor.
- d) All practices and procedures necessary for the safe and efficient operation of the systems and equipment, installed or modified under the Contract.
- e) Modification in the software to extend or modify the control and monitoring functions.
- f) Maintenance Management Information System and documentation.

11.4 Training Methods

11.4.1 As a general guide, Training shall consist of classroom (theory) training, computer based interactive multi-media training, and practical (hands on) training.

- a) The Contractor shall issue Competency Certificate to those staff who have acquired adequate knowledge in the Operations and Maintenance of the Equipment.
- b) The performance of Contractor's Instructors shall also be evaluated by the Project Manager at regular intervals.

11.4.2 The Contractor shall, at the conclusion of each training course, issue questionnaires to, and/or set practical tests for all trainees directed at determining the level of satisfaction with the course content and to assess the level of knowledge and understanding of the course content by each trainee.

11.5 Training Records

11.5.1 The Contractor shall, at the completion of each training course:

- a) provide the PM with a consolidated training record listing the training course title, date of training, name of all trainees, training result and other relevant information; and

--- End of Chapter 11 ---



CHAPTER 12

12 Operation & Maintenance Manuals

12.1 General

12.1.1 The Contractor shall prepare the Operation and Maintenance Manuals and submit to the Project Manager for review. Upon issue of Notice of No Objection from the Project Manager, the Contractor shall provide five (5) copies and one (1) electronic soft copy (.pdf on CD) to the Employer.

12.1.2 It is accepted that further amendments may subsequently be required.

12.1.3 Each and every manual shall be divided into indexed sections explaining the subject matter in logical steps. Most manuals shall consist of printed sheets bound in stiff-cover wear-resistant binders.

12.1.4 Information shall be provided in pictorial form wherever possible and shall include step-by-step instructions and views of the particular equipment including exploded views and flow charts to enable faults to be quickly identified and system modification to be undertaken at any time.

12.2 Operations

12.2.1 The Manual shall provide Operation Manuals explaining the purpose and operation of the complete system together with its component subsidiary systems and individual item of Equipment. The characteristics, ratings and any necessary operating limits of the Equipment and Sub-systems shall be provided.

12.3 Maintenance

12.3.1 The Contractor shall provide maintenance manuals showing details of all the various systems and sub-systems from a maintenance and fault-finding viewpoint, with particulars of operating parameters, tools for dismantling and testing, methods of assembly and disassembly, tolerances, repair techniques and all other information necessary to set up a repair and servicing program.

12.3.2 The manual shall also include inspection/overhaul procedure and periodicity of various inspection/overhaul schedules in detail including the tools, special tools/plants, and facilities required.

12.3.3 The maintenance manual shall also include an illustrated parts catalogue of all equipment and components supplied and shall contain sufficient information including Part No, Description, Life expected, General or specific purpose and technical specification to identify and requisition the appropriate part by maintenance staff.

12.3.4 The catalogue shall also contain illustrations to indicate the location of each replaceable item, which shall be clear and progressive with exploded views to enable parts to be identified easily by cross-reference with the alpha-numeric list.

--- End of Chapter 12 ---



CHAPTER 13

13 Traffic, Road & Transportation to Site

13.1 General

13.1.1 The Contractor shall conform to the applicable requirements of the Motor Vehicle Act 1988. The Contractor shall ensure compliance with the requirements regarding the licensing of drivers and the registration of vehicles. Vehicle size and load limitations shall be in accordance with all statutory requirements.

13.2 Transportation to Site

13.2.1 The Contractor shall make all arrangements and assume full responsibility for transportation of the Equipment to the Depot site. Procedures for access to and from the site shall be co-ordinated with the relevant Authorities.

13.2.2 The Contractor shall use such routes and rights of entry to the Site as may be decided by the Project Manager from time to time. Routes for 'very large' or 'very heavy' loads shall be discussed with the Project Manager in advance and all arrangements thereafter shall be submitted to the Project Manager. In this context, the definition of the terms "very large" and "very heavy" refer to articles that cannot be transported by normal road vehicles or be handled by readily available methods. Where doubt exists, it shall be the responsibility of the Contractor to notify and discuss the nature of the load in question with the Project Manager for possible solutions.

13.2.3 The Contractor shall be responsible for obtaining permission from the Traffic Police and other relevant authorities to move "very large" and "very heavy" loads and for arranging police escorts if required.

13.2.4 The Contractor shall repair damage caused, if any to existing roads, footpaths, steps, cables, sewers, drains, etc. and shall reinstate the same at its own expense to the satisfaction of the relevant authorities.

13.2.5 All of the Contracted material/ supplies should be transported only through registered common carriers, as per the provisions of carriage by Road Act, 2007 and Carriage by Road Rules, 2011.

--- End of Chapter 13 ---



CHAPTER 14

14 Supply of Spares, Special Tools and Test Equipment

14.1 General

14.1.1 The Contractor shall supply the Consumables / spares for maintenance of the Equipment during Installation, Testing & Commissioning;

14.2 Consumable Spares

14.2.1 The consumable spares shall include lubricants, oils, greases, sealants, filter media, gaskets, lamps, rubber items and wearable parts, etc. and such items, whose declared life is one year or less, considering use of the Equipment for at least 25 days in a month with single shift working.

14.2.2 In case any changes are required in the supply of consumables on account of changes at design stage, the Contractor shall have to supply the required consumables within the quoted cost. No increase in quoted cost shall be made due to any change in the list of consumables arising due to change/modification of design.

14.2.3 The Contractor shall submit a list of all spares of the Equipment, within 30 days after the delivery of the Equipment, which shall contain following information as a minimum:

- a) Names, addresses, telephone numbers and other particulars of manufacturers and their local representatives;
- b) Models and part numbers,
- c) Full description of spares including a note whether it is sealed unit or an assembly or sub-assembly which can be broken down into component parts;
- d) Quantity installed in the system;
- e) Shelf life.
- f) Anticipated periodicity of consumption;
- g) Overall dimensions and weight including minimum packing (if any) for shelf space purposes;
- h) Interchangeability or otherwise with similar parts;
- i) Normal delivery times after placement of Purchase Order; and

14.2.4 It shall be the responsibility of the Contractor to maintain a certain defined stock of consumable spares, as per the assessed requirement, during Comprehensive Maintenance Service period at the depot under the custody of the Depot Rolling Stock Manager. Spares consumed during maintenance during CMS period shall be replenished every quarter as per the Contract conditions.

14.2.5 Stocks of spares maintained by the Contractor at the Depot will be jointly checked with Employer's Engineer every three months. Certificate by Engineer confirming availability of the Contractor's spares in Depots as per agreed list will be a pre-requisite for release of interim payments of the Contractor. However, this condition will not be applicable during the last six months period before the expected expiry of the Comprehensive Maintenance Service period.

14.3 Warranty

14.3.1 The warranty period of all spares or any other item / equipment delivered shall be 12 months from the date of receipt of material.



14.4 Purchase of Spares from Vendors

- 14.4.1 The Contractor shall furnish an undertaking that he has no objection whatsoever and shall not in any way deter or obstruct the Employer, its licensee or its representative from dealing directly with the Contractor's Vendors for the purchase of the spares after the Operational Acceptance of the Equipment.
- 14.4.2 Contractor shall obtain an undertaking from vendors, OEMs, etc. that they have no objection to deal directly with Employer for supply of spares, equipment and/or sub-systems.

14.5 Commissioning Spares

- 14.5.1 The Contractor shall submit to the Project Manager for review a list of minimum spare parts that he intends to make available during the installation, testing & commissioning and guarantee test period.
- 14.5.2 The Contractor shall keep on Site, under its own custody and at its own cost, throughout the installation, testing & commissioning including guarantee testing period, stocks of spare parts, to enable rapid replacement of any item found to be defective or in any way in non-conformance with the Specification.
- 14.5.3 The Contractor shall generally not be entitled to use any of the Employer's spare parts during the installation, testing & commissioning periods.

14.6 List of Spares

- 14.6.1 If during the period of ten years, the Contractor intends to discontinue the manufacture of spare or replacement parts for the Machinery and Plants, the Contractor shall immediately give notice, at least six (6) months in advance, to the Employer of such intention. The Employer shall be given the opportunity of ordering at reasonable prices such quantities of such spare or replacement parts as the Employer shall reasonably require in relation to the anticipated life of the Machinery and Plants.
- 14.6.2 In the event of Contractor failing to supply the spare parts in accordance with this Clause, he shall in respect of each item of spare, furnish free of cost to the Employer, the drawings, specifications, patterns and other information to enable the Employer to make or have made such spare parts. The Employer shall be entitled to retain the aforesaid drawings, etc. for such time only as is necessary for the exercise by the Employer of its rights under this clause and the drawings, if the Contractor so requires, shall be returned by the Employer to the Contractor in good order and condition (fair wear and tear excepted).
- 14.6.3 Under such circumstances, the Contractor shall also grant to the Employer, without payment of any royalty or charge, full right and liberty to make or have made spare or replacement parts as aforesaid and for such purposes only to use, make and have made copies of all drawings, patterns, specifications and other information supplied by the Contractor to the Employer pursuant to the Contract.
- 14.6.4 The Contractor will so far as it is reasonably able to bind its sub-Contractors to conform with the requirements of this Clause and shall, prior to entry into any sub-Contracts, provide the Employer with full details of any sub-Contractor who will not so conform in which event the Employer may direct the Contractor to seek an alternative sub-Contractor.
- 14.6.5 In the event that technological progress results in improved versions of spares and replacement parts, the latest version shall have the same plug compatibility, and spatial needs of its predecessor, to avoid modifications being required, to accept the up-graded version of the part.

--- End of Chapter 14 ---



CHAPTER 15

15 Work Site Management

15.1 Access to Site

15.1.1 The Contractor will be given access to the Site in accordance with Clause 10.2 of the General Conditions of Contract.

15.2 Site Facilities

15.2.1 The Contractor will be provided, free of cost, a total space at depot, matching the requirements as decided by the Project Manager, for the setting up of Contractor's site office and for keeping covered stores, and for the staff working for Installation, Testing & Commissioning. These site offices shall be built commensurate with the architecture of the surrounding buildings and after obtaining the approval of Project Manager for its broad design. The structure shall be handed over to Employer after the commissioning of the Equipment.

15.2.2 The Contractor shall arrange its furnishing, security, etc.

15.2.3 Suitable and adequate fire-fighting equipment shall be provided as is considered necessary.

15.2.4 Three Phase and Single-Phase Power (as required) will be made available to Contractor free of charge for Testing & Commissioning of the Equipment. The Contractor shall liaise with Interfacing Contractors for availing of the power and assuring compliance of all safety procedures. The Contractor shall provide his own operators for Testing, Commissioning and Guarantee Testng.

15.2.5 The Contractor shall provide its own lifting facilities for unloading of Equipment and any heavy item, at the port of arrival, for transshipment, and at the depot. The Contractor shall, however, be allowed to use any necessary Depot facilities free of charge for assembly, commissioning, inspection and repairs, subject to availability. The Employer shall, however, not be responsible for adequacy, reliability and safety of the facilities provided to the Contractor.

15.2.6 Reasonably lit access to the areas and to rail sidings, if applicable, will be provided by the Employer. The Contractor shall be solely responsible for the security and housekeeping of the area, plant and possessions allocated to him. The Contractor shall provide and maintain all facilities required by him in the area allocated for its exclusive use and all other work required to allow the Contractor to fulfil its obligations under the Contract.

15.2.7 The Contractor shall arrange at its own cost all Site services necessary and appropriate for the assembly, testing and commissioning of the Equipment, which shall include, but not necessarily be limited to:

- a) Compressed air;
- b) Water
- c) Instrumentation.

15.2.8 The Contractor shall be responsible for making applications or requests to the concerned Authorities for availing of the above facilities. In the event that electricity or water supplies are arranged by another Interfacing Contractor in the Depot area, the Contractor may avail himself of those supplies from the Interfacing Contractor, directly on agreed terms and conditions. The Contractor shall comply with all regulations of the utility companies and Government departments concerned.



15.3 Site Management

15.3.1 The Contractor shall:

- a) confine its use of the areas of the Site to purposes as required for the Work;
- b) refrain from depositing rubbish or causing nuisance or permitting nuisance to be caused and, except where reviewed without objection by the Project Manager, depositing earth on or removing earth from areas of the Site;
- c) unless otherwise stated, pay all rates and charges of any nature whatsoever arising out of his use of the Site and all work areas provided therein as provided under the Contract.
- d) not use any part of the Site or Works for advertising purposes except with the acceptance of the Project Manager.

15.3.2 The Site shall be maintained in a clean and tidy condition. Materials, including those required for Temporary Works, shall be stored in an orderly manner.

15.3.3 The Contractor shall provide all necessary protective clothing, safety equipment, hand tools, ladders, trestles, power supply, and replacement equipment for the staff engaged on Site maintenance.

15.3.4 Because of the multi-disciplinary nature of the Project, several different parties may require access to the same portion of the Site during the construction phase, for the installation, erection and testing of the Works. To facilitate the organization and co-ordination of access and occupation requirements, the Contractor shall maintain a close liaison with other Contractors.

15.3.5 As soon as any or all of the Contractor's temporary installations are no longer required for the execution of the Works, the Contractor shall remove those facilities and ensure that the area is left free of debris, excess materials, and obstructions.

15.4 Site Safety

15.4.1 The Contractor shall, during installation stage, take care of the Occupational Health, Safety & Environment aspects (OHS&E) for the health and safety of the workers engaged in the Installation work. The Contractor shall be expected to follow the provisions of different statutory provisions and ensure the Health and Safety of workers and taking care of the Environment. The Contractor as well as his subcontractors shall actively pursue both at the Works and the Installation Site, the achievement of

- a) BS EN OHSAS 18001:2007- OHS Management System
- b) BS EN 18002, OHS Management System- Guidelines
- c) ISO 14001:2004- Environmental Management System

15.4.2 The Contractor shall ensure, where required, availability of a Portable First Aid Box in a fully equipped state and a trained person to give First aid at Site during the period the Contractor's personnel are on site for Installation, Testing & Commissioning work.

15.4.3 The Contractor shall be fully responsible for the safety of its personnel, its sub- Contractors' personnel, the public, and any persons directly or indirectly associated with the Installation Works, on or in the vicinity of the depot site for any unwanted/ unsafe act on the part of its workers.

15.4.4 The Contractor shall notify and submit a report to the Project Manager immediately after the occurrence of an incidence involving its staff or that of its sub-Contractors, or to any person at the Installation site. Reportable incidents shall include fatal accidents, major injuries (any fracture, loss of limb or part of limb, dislocation of the shoulder, hip, knee or



spine, loss of sight whether temporary or permanent, penetrating injury to the eye) and dangerous occurrences (Collapse of foundation, building or lifting appliances, fire, electrical short circuit resulting in damages, any explosion, collision of any moving equipment etc).

- 15.4.5 The Contractor shall submit the report of the above reportable incidences in standard forms available with the Project Manager. The first report shall be made through SMS to the Co-ordinating Engineer of the Project Manager.
- 15.4.6 The Contractor shall also carry out his own investigation of the reportable incidences and submit the investigation report to the Project Manager. Follow up action as is considered necessary shall also be taken by the Contractor.
- 15.4.7 In the case of a reportable incidence, the Contractor shall not disturb the scene of incidence except to make the area safe or to shift the injured persons for treatment.
- 15.4.8 The Contractor shall deploy his persons at the Site who are competent for the work involving hazardous situations, viz. working close to 25kV Overhead Electrical system, working at height, etc. Each person deployed shall carry a Permit to Work with him issued by the Contractor. Permit to work for Electrical Work and Hot Work shall be issued on standard forms to be collected from the Project Manager.
- 15.4.9 All persons deployed by the Contractor shall wear suitable and sufficient Personal Protective Equipment, e.g. Safety Helmets, Protective Goggles, Safety Harnesses, Safety Shoes, etc.
- 15.4.10 The Site Engineer shall also act as the Safety Officer during the work at Site and shall be suitably trained in this work.

--- End of Chapter 15 ---



CHAPTER 16

16 Photographs and Public Relations

16.1 Progress Photographs

16.1.1 After completion of manufacturing, the Contractor shall furnish photographs of the manufactured Equipment.

16.1.2 Each photograph shall have forty millimetres by eighty millimetres title block in the lower right- hand corner, which shall show the following information:

MMRC CONTRACT No:

CONTRACT NAME:

CONTRACTOR:

PHOTOGRAPH No (Unique serial number based on agreed drawing numbering system):

DATE of PHOTOGRAPH:

DESCRIPTION:

16.1.3 Detailed photographs (date and time stamped) of each Plant & Equipment on its arrival at the depot and before introducing for regular use shall be archived and copies handed over to the Project Manager. The photographs must include all such items that are incomplete / defective, etc. Complete set (soft copy) shall be submitted to the Project Manager.

16.2 Public Relations:

16.2.1 The Contractor shall not provide any press release, press statement or publish any subject related to the Project without first seeking clearance from MMRC.

16.2.2 The Contractor shall, in conjunction with the Project Manager, liaise with Public Relations Officer, MMRC on all press and public relations matters in connection with the Contract.

16.2.3 All press releases, press statements, articles or printed material prepared by the Contractor shall be submitted to MMRC, in consultation with the Project Manager prior to publication or release to the news media.

16.2.4 All press queries relating to the Contract received by the Contractor must be referred to MMRC for clearance, in consultation with the Project Manager.

16.2.5 Use of the MMRC logo in the Contractor's publications shall be subject to approval of MMRC.

16.2.6 The Contractor shall provide MMRC and the Project Manager with schedules relating to night works, traffic diversions, closure of road, etc. that may cause inconvenience to the public.

--- End of Chapter 16 ---



CHAPTER 17

17 Temporary Electricity Supply

17.1 Electricity Supply for the Contractor by the Depot Civil Contractor

- 17.1.1 The Contractor, during installation of the Equipment, shall use the power supply, where required, provided by the Depot Civil Contractor, if available.
- 17.1.2 The Contractor will be responsible for reimbursement to the Depot Civil Contractor of the utility charges for consumption of electricity.

17.2 Work on Site

- 17.2.1 The Site Engineer of the Contractor shall be solely responsible for ensuring the safety of all temporary electrical equipment on Site. All necessary safety precautions shall be taken into consideration.
- 17.2.2 The Contractor shall submit schematic diagrams and the details of the equipment for all temporary electrical installations, and these diagrams together with the temporary electrical equipment shall be submitted to the Project Manager for Notice of No Objection.
- 17.2.3 All electrical installation work on Site shall be carried out in accordance with the requirements laid down in BS 7375 and the Specification and should comply with various statutory Rules and Regulations connected with the work. All work shall be supervised or executed by qualified and suitably categorized electricians, who are registered as such under the Electricity Ordinance 1990/Electricity (Registration) Regulations 1990. Copies of the electrician's registration shall be kept on site and the Project Manger shall be allowed to inspect at any time.
- 17.2.4 All cabling shall be run at high level whenever possible and be firmly secured to ensure they do not present a hazard or obstruction to people and equipment.
- 17.2.5 Protection shall be provided for all main and sub-circuits against excess current, residual current and earth faults.
- 17.2.6 Periodic checks of control apparatus and wiring distribution systems shall be carried out by an electrician (duly qualified to carry out the said checks) to ensure safe operation of the system.

17.3 Inability to Supply

- 17.3.1 Wherever, the Depot Civil Contractor is not in a position to supply construction power and water supply to the Interfacing Contractor, the Contractor shall arrange for his own separate temporary construction power and water supply all at his own cost for installation of the Equipment.

----- End of Chapter 17 -----



MUMBAI METRO LINE 3

Part 2

EMPLOYER'S REQUIREMENTS

Section VI-A

GENERAL SPECIFICATIONS AND APPENDICES

LIST OF APPENDICES

**Mumbai Metro Rail Corporation Ltd
MMRC Line 3 Transit Office,
Wing 'A', 'E' Block,
Bandra-Kurla Complex,
Bandra (East) Mumbai 400 051.**



APPENDIX 1- Key Dates

1. KEY DATES

The Contractor shall prepare and submit his detailed Program of Work so as to achieve key dates of various activities on time. The Contractor shall complete the work in a phased manner by fixing priorities to different stretches of work to give access to the other interfacing Contractors as per the requirement of project from time to time and as per the key dates (milestones) indicated below:

CONTRACT KEYDATES
Schedule of Key Dates- Automatic Train Wash Plant

Key date No.	Key Activity	Days
KD - 1	Submission of Work program, Design submission program, Equipment Preliminary Drawing, electric supply details and Equipment Foundation Drawing and obtain the Project Manager's 'Notice of No Objection' to the above.	56
KD - 2	Submission of Equipment detailed design drawings and Project Management Plans and obtain the Project Manager's 'No Objection' to the above.	84
KD - 3	Dispatch of the Equipment to MML3 Depot Mumbai along with O&M Manual and Spare Parts Catalogue	264
KD - 4	Installation, Testing & Commissioning (excluding Guarantee tests), Supply of Training Manual and Training of O&M Personnel of Employer.	371
KD - 5	Completion of all obligations (including Guarantee tests) of the Contractor under the Contract	474

Notes on Key Dates:

1. The achievement of a Key Date shall be subject to the issuing of a Notice of No Objection from the Project Manager.
2. The achievement of a Key Date shall require completion of all the works specified for achievement of the Key Date.
3. The achievement of Key Dates shall be read in conjunction with the Interface Specifications to establish access requirements for Interfacing Contractors.

Schedule of Access Dates

The table below sets out the access dates when Site Areas will be made available to the Contractor together with the dates by which they must be vacated by the Contractor. These should be taken in to account in implementation schedule.



Equipment: Automatic Train Wash Plant

Site area: **The area for Installation, Testing and Commissioning of Equipment.**

System	Access days	Vacate days	Reason for vacation
Depot Civil	320 days	After commissioning	Completion of the assembling, testing & commissioning and training.
E&M	320 days	----	
Track	320 days	----	

Applicable rate for liquidated damages for respective Equipment

- 1) If the Contractor fails to deliver as per the Key Dates within the period fixed for such delivery in the Contract or as extended from time to time, or at any time repudiates the Contract before the expiry of such period, the Employer may, without prejudice to his other rights, recover from the Contractor as agreed Liquidated Damages as follows:
 - i) For KD- 2: 0.25 % of the Price in Schedule No 3 per each complete week of delay;
 - ii) For KD-3: 0.25 % of the Price in Schedule No 1 and in Schedule No.2 per each complete week of delay;
 - iii) For KD- 4: 0.25 % of the Price in Schedule No 4 per each complete week of delay;
 - iv) For KD- 5: 0.30 % of the Price in Schedule No 4 per each complete week of delay;
- 2) There is no maximum limit in levy of LD for delays in individual Key Dates. However, the aggregate amount of such liquidated damages shall in no event exceed 10% of the Contract price.
- 3) In case the Contractor is able to achieve KD-4, without delay on Contractor's account, all the applicable liquidated damages on KD-2 to KD-3 may be waived off and LD amount, if deducted, may be returned (without interest) to the Contractor.

— End of Appendix 1 —



APPENDIX 2- Definitions

Definition	Meaning
Access Dates	These are the dates that are to be achieved by the Interfacing Contractors and which are considered to be essential to the successful completion of the Contract to the Original planned schedule.
As-Built Drawings	These are those drawings produced by the Contractor and endorsed by it as true records of construction of the Works and which have been a given a Notice of No Objection by the PM.
Design Checker	Means a suitably qualified person appointed by the Contractor to check the Design of the Works.
Factory Acceptance Tests (FAT)	Means the tests to be performed at the Contractor's Works prior to delivery to the Site to verify compliance with the Specifications.
Installation Tests	Means the tests to be performed to verify the conformity of completion of an installation to the design documents previously issued a Notice of No Objection by the PM prior to the start Installation.
Service Trial	Means the phase after completion of the Integration Testing and Commissioning where the training and operating procedures are validated. Service Trial form part of the Tests and Inspection to be performed under the Contract.
Integrated Testing and Commissioning	Means those tests that demonstrate the integration of the complete system meeting the requirements of the Specification in an operating environment.
Validation	Means the process of confirmation by examination and provision of objective evidence that the application produced achieves the particular requirements specified.
Works	Means the Permanent Works or the Temporary Works, or either of them as appropriate.
Permanent Works	Means the Plant and Equipment to be supplied and installed, as well as all the Installation Services to be carried out by the Contractor under the Contract.
Temporary Works	Means the works that shall not remain on the Site after Employer's taking over of the Works.
Maintenance	Means the maintenance to be carried out in accordance with the Contractor's Maintenance Manual.
Preventive Maintenance	Means the maintenance specified by the Contractor's Maintenance Manuals to be carried out from the period of Taking over of the Contract Works.

----- End of Appendix 2 -----



APPENDIX 3- Programs

3. PROGRAMS

3.1 Time-scaled Network / Bar Chart

- 3.1.1 All programs shall be developed by computerised Critical Path Method (CPM) using the Precedence Diagramming Method (PDM) and shall be presented in either bar chart or time-scaled network diagram format, suitably coloured to enable easy reading. All duration for the purpose of programming shall be in calendar days. All reference to network shall mean time-scaled network unless otherwise specified.
- 3.1.2 The coding structure shall be such that the activities can be summarised to the various levels. Each level shall be summarised and collapsed to the next level using the programming software. The Contractor shall propose essential codes and activity codes to be used for review of the Project Manager. The Project Manager may require additional activity codes subject only to restrictions imposed by the programming software. Additional codes where necessary may be created by the Contractor with the approval of the Project Manager. Each activity in the network shall be coded, as a minimum, with the following:
- a) Contract number, activity type, and unique identification numbers.
 - b) Activity codes to indicate Unit, Segment, Stage or Phase, for e.g. design, manufacturing, delivery, installation, etc.
 - c) The Contractor shall note that breakdown of system into sub-systems is essential and shall be carried out not through further coding but through activity descriptions in a consistent manner such as to allow storing. However, the Project Manager shall have the right to require the Contractor to code sub-systems, using codes approved by him, if necessary.
 - i) Area, location and location details under Activity Code – Unit.
 - ii) Cost and resources
 - iii) Cost and resources codes shall be submitted for the approval of the Project Manager. For Bid purposes, the Bidder shall use its own codes.
- 3.1.3 All logical and necessary relationships between activities shall be shown.
- 3.1.4 All key dates indicated in the Contract shall be shown. In addition to the key dates, the Contractor may require certain events that are critical to its work to be reflected in its programs. These shall be reflected as "milestones". Appropriate activity codes shall be used to distinguish "milestones" from the Key Dates.
- 3.1.5 Activities pertaining to review/acceptance by the Project Manager and local authorities shall be identified. Where duration for review of the Contractor's submissions are specified elsewhere in the Contract, they shall be used. Where they are not specified, a duration of 30 days for review of each submission shall be used.
- 3.1.6 Activities outside the scope of the Contract that may affect the Contractor's progress shall be shown.
- 3.1.7 The activity network shall be organised so that major work sections are carefully coordinated with the Civil Contractor and the System-wide Contractors to allow opportunity for all to work with as minimal disruption as possible.
- 3.1.8 Activity descriptions shall be brief (<48 characters) and shall convey the nature and scope of the work. Uncommon abbreviations shall be explained in the legend. Float time shall be



distinguished from schedule performance.

3.1.9 The CPM Network Diagram shall be developed to permit modification to the schedule and allow for impacts on the schedule to be analysed by introduction of "what if" statements into the input data.

3.2 Time Scaled Network/Bar Chart Details

3.2.1 Design: The Design network/bar chart shall detail the various design, submission and acceptance stages including approval by local authorities and the Project Manager, preparation, submission and approval of drawings, manuals and all other activities related to the design.

3.2.2 Manufacturing: The manufacturing network chart shall indicate the relationship and duration of the activities necessary to procure, fabricate manufacture, assemble equipment/complete tests, ship and delivery of M&Ps in time to support the activities at site. It shall establish milestones for monitoring the progress of the manufacturing process. Major areas of work shall be shown as separate and distinct activities. The network shall also cover activities of Sub-Contractor as appropriate, including testing.

3.2.3 Testing and Commissioning: The Factory and On-Site Testing and Commissioning network/bar chart shall present the relationship and duration of those items relating to Commissioning tests including those related to other Interfacing Contractors. The network/bar chart shall present testing approach to be used, the deployment of resources in accordance with M&P delivery dates.

3.2.4 Guarantee Testing: The Guarantee Testing network/bar chart shall indicate the activities required to verify the functioning of the Equipment in conjunction with activities of the System-wide and Civil Contractors.

----- End of Appendix 3 -----



APPENDIX 4- Quarterly Progress Report

4 QUARTERLY PROGRESS REPORT

Note: Contractor shall refer to Para 2.8 of General Specifications regarding Employer's IT Requirements. The requirements pursuant to this Appendix shall be effected through the "Integrated Project Management Platform".

4.1 Contract Stages

4.1.1 General

The Contractor shall submit to the Project Manager, a Quarterly Progress Report. This Report shall be submitted by the end of each calendar Quarterly period and shall account for all work actually performed from 1st day of the last Quarter period and up to end of the Quarterly period of the submission. It shall be submitted in a format to which the Project Manager shall have given consent, but not be limited to the topics listed in the clauses below.

4.2 Financial Status

4.2.1 A narrative review of all significant financial matters, and actions proposed or taken in respect to any outstanding matters.

4.2.2 A spread sheet indicating the status of all payments due and made.

4.2.3 A report on of the status of any outstanding claims. The report shall in particular provide interim updated accounts of continuing claims.

4.3 Physical Progress

4.3.1 It shall describe the status of work performed, including critical items and problem areas, corrective actions taken or planned and other pertinent activities, and shall, in particular, address interface issues, problems and resolutions.

4.4 Program Update

4.4.1 Program updating shall include:

- a) The Quarterly Program Update which shall be prepared by recording actual activity completion dates and activities completed up to the end of the Quarterly period together with estimates of remaining duration and expected activity completion based on current progress. The Program Update shall be accompanied by an Activity Report and a Narrative Statement. The Narrative Statement shall explain the basis of the Contractor's submittal:
- b) Discuss Variation Order Work Items, if any.

4.5 Milestones Status

A report on the status of all Milestones due to have been achieved during the Quarterly period and forecasts of achievement of any missed Milestones, and those due in the next Quarterly period.

4.6 Planning and Co-Ordination

4.6.1 A summary of all planning/co-ordination activities during the Quarterly period and details of outstanding actions.

4.6.2 A schedule of all submissions and consents/approvals obtained/outstanding.

4.7 Areas of Concern & Critical Issues

The Contractor shall submit a review of all areas of concern and critical issues during the Quarterly period including appropriate details of such issues for drawing attention of the Project Manager.

----- End of Appendix 4 -----



APPENDIX 5- Interface Sheet

Attachment A - Interface Specification Form

INTERFACE SPECIFICATION			Ref: to create	
	Contract Designation	Contractors Sequence Number	Date of Issue	
Initiating Contractor			Interface Manager Signature	
Responding Contractor			Interface Manager Signature	
Interface Specification Required for;			Response Required by;	
Reviewed by;				
Design Sections			Station Arch. / Building Services	
<u>Description of the Interface</u>				
<u>Specific Details of the Interface</u>				<u>Location</u>
Drawings / Specifications Attached				
Title	Drawing / Specification Ref.		Drawing Issue	
Document				
Document	Name	Date	Document References (if any)	
Prepared by:				



Attachment B - Confirmation of Co-ordination Form

Mumbai Metro Rail Project					
Ref No.					
CONFIRMATION OF CO-ORDINATION					
CONTRACT:				TRANSMITTAL No.:	
TITLE:					
ACTIVITY NO.:					
GENERAL DESCRIPTION:					
SIGNATURE OF INTERFACING CONTRACTORS:					
	Interfacing Contractor	Authorized Name	Signature	Date Reviewed	Comment
1					
2					
Signatures above confirm that this design document has been reviewed as part of the co-ordination process.					
<p>NOTE: Where Contractors are not in agreement with the details on this submission, they are to comment above and advise the interfacing party in question requesting accommodation of the requirement and advise the PM under separate cover and report progress in Monthly Report / Co-ordination Meetings.</p>					





Attachment N – Indicative Interface Sheets for Contract MM3-CBS-DEQ

SL NO	Description
N1	Indicative Interface Sheet for Depot Equipment (DEQ-9-02) and Rolling Stock (RS)
N2	Indicative Interface Sheet for Depot Equipment (DEQ-9-02) and for Signalling & Train Control, Platform Screen Doors and Telecommunication Systems (STPT)
N3	Indicative Interface Sheet for Depot Equipment (DEQ-9-02) and Track Work (TWK-01)
N4	Indicative Interface Sheet for Depot Equipment (DEQ-9-02) and Asset Management System (AMS)
N5	Indicative Interface Sheet for Depot Equipment (DEQ-9-02) and Depot Civil Works (DPT)
N6	Indicative Interface Sheet for Depot Equipment (DEQ-9-02) and Depot Equipment (DEM)

INTERFACE SHEET

N1. Indicative Interface Sheet for Depot Equipment (DEQ) and Rolling Stock (RS)

Mumbai Metro Interface Sheet	Contract A	DEQ	Contract B	RS	Rev #:	AI												
					Date:	03/04/17												
Approved by:	DEQ (Depot Equipment) (Lead Contract)		RS (Rolling Stock) (Participating Contract)		First issue:													
GC issued by:																		
Checked by:																		
General Interface details between the Rolling Stock (RS) and Depot Equipment (DEQ-9-02)																		
<table border="1"> <thead> <tr> <th>Contract A (DEQ-9-02)</th> <th>DESIGN STAGE</th> <th>Contract B (RS)</th> </tr> </thead> <tbody> <tr> <td>DEQ/RS-01: Shall ask and collect, from Contractor B, all relevant information of the type/ quality of brushes/ scrubbers, detergents and water suitable for the Rolling Stock with a view to avoid any damage to the Rolling Stock surface and design the Wash Plant accordingly.</td> <td>DEQ/RS -01: Shall provide details, to Contractor A, of all relevant information regarding suitable brushes/ scrubbers, detergents and water for the Rolling Stock material.</td> <td></td> </tr> <tr> <td>DEQ/RS -02: Shall collect, from Contractor B, all relevant dimensions of Rolling Stock for the effective design of Wash Plant</td> <td>DEQ/RS -02: Shall provide details, to Contractor A, of Rolling Stock dimensions as relevant to the design of Wash Plant.</td> <td></td> </tr> <tr> <td>Contract A (DEQ)</td> <td>CONSTRUCTION / INSTALLATION STAGE</td> <td>Contract B (RS)</td> </tr> </tbody> </table>							Contract A (DEQ-9-02)	DESIGN STAGE	Contract B (RS)	DEQ/RS-01: Shall ask and collect, from Contractor B, all relevant information of the type/ quality of brushes/ scrubbers, detergents and water suitable for the Rolling Stock with a view to avoid any damage to the Rolling Stock surface and design the Wash Plant accordingly.	DEQ/RS -01: Shall provide details, to Contractor A, of all relevant information regarding suitable brushes/ scrubbers, detergents and water for the Rolling Stock material.		DEQ/RS -02: Shall collect, from Contractor B, all relevant dimensions of Rolling Stock for the effective design of Wash Plant	DEQ/RS -02: Shall provide details, to Contractor A, of Rolling Stock dimensions as relevant to the design of Wash Plant.		Contract A (DEQ)	CONSTRUCTION / INSTALLATION STAGE	Contract B (RS)
Contract A (DEQ-9-02)	DESIGN STAGE	Contract B (RS)																
DEQ/RS-01: Shall ask and collect, from Contractor B, all relevant information of the type/ quality of brushes/ scrubbers, detergents and water suitable for the Rolling Stock with a view to avoid any damage to the Rolling Stock surface and design the Wash Plant accordingly.	DEQ/RS -01: Shall provide details, to Contractor A, of all relevant information regarding suitable brushes/ scrubbers, detergents and water for the Rolling Stock material.																	
DEQ/RS -02: Shall collect, from Contractor B, all relevant dimensions of Rolling Stock for the effective design of Wash Plant	DEQ/RS -02: Shall provide details, to Contractor A, of Rolling Stock dimensions as relevant to the design of Wash Plant.																	
Contract A (DEQ)	CONSTRUCTION / INSTALLATION STAGE	Contract B (RS)																





Mumbai Metro Interface Sheet	Contract A	DEQ	Contract B	RS	Rev #:	AI
					Date:	03/04/17
<p>DEQ/RS -03: Shall ensure conformance to design parameters during construction/ installation of Depot Equipment.</p>		<p>DEQ/RS -03: Shall check and confirm conformance, to Contractor A, regarding correct construction/ installation of the Wash Plant.</p>				
<p>Contract A (DEQ)</p>		<p>TEST & COMMISSIONING STAGE</p>		<p>Contract B (RS)</p>		
<p>DEQ/RS -04: Shall conduct joint tests, with Contractor B, demonstrating that the Wash Plant is adapted and compliant to Rolling Stock requirements.</p>		<p>Contract A (DEQ)</p>		<p>MAINTENANCE STAGE</p>		
<p>DEQ/RS -05: Shall prepare and provide Operation & Maintenance Manual of supplied Wash Plant.</p>		<p>Contract A (DEQ)</p>		<p>Contract B (RS)</p>		
<p>DEQ/RS -05: Shall review and comment Operation & Maintenance Manual to ensure that the Manual of Wash Plant is compliant with Rolling Stock requirements.</p>		<p>Contract A (DEQ)</p>		<p>Contract B (RS)</p>		

Mumbai Metro Interface Sheet	Contract A	STPT	Contract B	DEQ	Rev # : Date:	A3 23/09/17
STPT/DEQ-04: Shall install relevant signalling/ train control system to regulate the train movement over the Wash Plant Bed under different situations as per the requirements of Contractor B.			STPT/DEQ-04: Shall check and confirm the train control system over the Wash Plant Bed under different situations.			
Contract A (STPT) TEST & COMMISSIONING STAGE Contract B (DEQ-9-02)						
STPT/DEQ-05: Shall jointly check with Contractor B for LAN wiring locations and internet connection required by DEQ for Wash Plant.			STPT/DEQ-05: Shall check and confirm LAN wiring connections and internet connection of LAN wiring for Wash Plant.			
STPT/DEQ -07: Shall jointly check train movement over Wash Plant Bed under different situations as per the requirements of Contractor B.			STPT/DEQ -07: Shall check and confirm the train movement as per the requirements under different situations.			



N3. Indicative Interface Sheet for Depot Equipment (DEQ) and Track Work (TWK-01)

Mumbai Metro Interface Sheet	Contract A	DEQ	Contract B	TWK-01	Rev #:	A-1
Approved by:	Depot Equipment (DEQ) Lead Contract		Track Work (TWK-01) Participating Contract		Date:	09/10/2017
GC issued by:					First issue:	
Checked by:						
General Interface details between the Track Work Systems (TWK-01) and Depot Equipment (DEQ-9-02)						
Contract A (DEQ-9-02)			DESIGN STAGE			
DEQ/TWK-01: Shall collect, from, Contract B, track specifications and track design drawings, water drainage, over the Wash Plant Bed for designing the Wash Plant Equipment.			DEQ/TWK-01: Shall provide, to Contract A, any relevant specifications, design drawings and water drainage details.			
Contract A (DEQ-9-02)			CONSTRUCTION / INSTALLATION STAGE			
DEQ/TWK-02: Shall plan and coordinate the installation of the Wash Plant with the progress of track work.			DEQ/TWK-02: Shall support Contract A with Track Works with the installation of the Wash Plant by making the track available.			
Contract A (DEQ-9-02)			TEST & COMMISSIONING STAGE			
DEQ/TWK-04: Shall conduct joint tests demonstrating that Wash Plant is perfectly adapted to the track.			DEQ/TWK-04: Shall provide necessary support to Contract A during the tests carried out for demonstrating that Wash Plant is perfectly adapted to the track work.			



N4- Indicative Interface Sheet for Depot Equipment and Asset Management System (AMS)

Mumbai Metro Interface Sheet	Contract A	AMS	Contract B	DEQ	Rev #	: A
Approved by:	AMS (Asset Management System) Lead Contract		DEQ (Depot Equipment) Participating Contract		Date	08/09/2017
GC issued by:					First issue;	
Checked by:						
Contract A (AMS)		DESIGN STAGE		Contract B (DEQ-9-02)		
AMS/DEQ-01: Shall collect all relevant data about the Equipment from Contract B				AMS/DEQ-01: The Contractor shall share the list of all components, sub-components of equipment along with operational data in MS Excel.		
Contract A (AMS)	CONSTRUCTION / INSTALLATION STAGE		Contract B (DEQ-9-02)			
AMS/DEQ-02: Shall coordinate and update data inputs on AMS.				AMS/DEQ-02: Shall coordinate with Contract A with any further relevant data required in updating on AMS		



N6. Indicative Interface Sheet for Depot Equipment (DEQ) and Depot Equipment (DEM)

Mumbai Metro Interface Sheet	Contract A	DEQ	Contract B	DEM	Rev # : A0
Approved by :	Depot Equipment (DEQ) Lead Contract		DEPOT E&M (DEM) Participating Contract		Date 31/08/2017 First issue:
GC issued by :					
Checked by :					
Interface description brief / Key elements (time schedule, physical, functional, ...):					
1.General Interface details between the Depot Equipment Contractor (DEQ) and Depot E&M Works Contractor (DEM)					
Contract A (DEQ9-02)			Contract B (DEM)		
DESIGN STAGE					
DEQ /DEM-01: Shall provide the requirements of total Electrical Power (starting and full load currents, kilowatts, lighting, Earthing Cable, Routing & location of the power point (Isolator) for Wash Plant.	DEQ /DEM-01: Shall collect and design the load details from "Contract A" w.r.t the requirements of power and earthing, Cable routing, isolator's, circuit breakers, lighting and other electrical/mechanical requirements				
	Power incoming cable and earthing up to & with main switch in DEM electrical panel only. "Contract A" shall extend from this point to Wash Plant.				
DEQ /DEM-02: Shall provide the architectural/ structural/ fixing 'general arrangement drawing' of Wash Plant.	DEQ /DEM-02: Shall incorporate Contractor-A's requirement in his design w.r.t DEM works only.				





Mumbai Metro Interface Sheet	Contract A	DEQ	Contract B	DEM	Rev # : A0	Date 31/08/2017
DEQ /DEM -03: Shall provide the interface details of fire detection and firefighting system needed for the Wash Plant room.			DEQ /DEM -03: Shall collect the details from Contractor-A, and utilize the input for fire protection system as well as provide functional requirements under various emergency conditions.			
Reference documents:			Reference documents:			
Contract A (DEQ-9-02) CONSTRUCTION / INSTALLATION STAGE Contract B (DEM)						
DEQ /DEM-05: Shall jointly check the availability of requirements for Wash Plant installation, like Power Supply, lighting, Earthing Cable routing, power supply Isolator point, suitable for Wash Plant installation and confirm.			DEQ /DEM-05: Shall provide 'Contractor A' the necessary inputs for the Wash Plant installation requirements.			
DEQ /DEM-07: Shall coordinate and confirm 'Contractor B' executions in Depot with respect to fire detection & firefighting system for Wash Plant.			DEQ /DEM -07: Shall provide and install Fire detection & firefighting system in the Wash Plant Room.			
Reference documents:			Reference documents:			
Contract A (DEQ-9-02) TEST & COMMISSIONING STAGE Contract B (DEM)						
DEQ /DEM-08: Contract-A Shall Conduct test run jointly with Contractor-B			DEQ /DEM-08: Contractor-B shall co-ordinate with Contractor-A			
Reference documents:			Reference documents:			
Contract A (DEQ9-02) MAINTENANCE STAGE Contract B (DEM)						
DEQ /DEM-09: Shall prepare Operation & Maintenance Plan as per the Operation & Maintenance manual supplied by Contractor A and agreed by all the parties.			DEQ /DEM-09: Shall review Operation & Maintenance manual and confirm its suitability from DEM facilities point of view.			

APPENDIX 6- Drafting and CAD Standards

6. DRAFTING AND CAD STANDARDS

Note: Contractor shall refer to Para 2.8 of General Specifications regarding Employer's IT Requirements. The requirements pursuant to this Appendix shall be effected through the "Integrated Project Management Platform", as applicable.

6.0 Introduction

- 6.0.1** The purpose of this document is to define the minimum Drafting and CAD standard to be achieved by the Contractor for all drawings produced by the Contractor for the purpose of the Works.
- 6.0.2** By defining a common format for the presentations of drawings and CAD files, the exchange of drawn information is improved and will maximise the use of CAD in the co-ordination process.
- 6.0.3** All submissions shall be made to the Employer's Requirement in a format reviewed without objection by the Employer's Requirement and in accordance with the requirements in:
- a) the Contract;
 - b) the Document Submittal Instructions to Consultants and Contractors.
- 6.0.4** Paper and drawing sizes shall be "A" series sheets as specified in BS 3429.
- 6.0.5** The documents shall be submitted in the following software unless otherwise stated, for the various electronic submissions required. Any formulae / micros / programs used therein shall not be hidden / masked and must be visible and transparent without any compromise and shall be validated for the submissions. The following software compatible for use with Intel-Windows based computers shall be used, unless otherwise stated, for the various electronic submissions required:

Document Type	Electronic Document Format
Text Documents	MS office Professional (latest version)
Spread Sheets	MS office Professional (latest version)
Data Base Files	MS office Professional (latest version)
Presentation Files	MS office Professional (latest version)
Programs	Primavera enterprise/M S Project (latest version)
AutoCAD Graphics	AutoCAD 2016 OR latest
Photographic	Adobe Photoshop CC (2015.5) OR latest
Desktop Publishing	Adobe Page Maker 7.0 OR latest
CADD Drawings	AutoCAD 2016 OR latest

6.0.6 Media for Electronic File Submission: One copy shall be submitted unless otherwise stated in CD-ROM / DVD / USB Stick / Pen Drive.

6.0.7 Internet File Formats/Standards

- a) The following guidelines shall be followed when the Contractor uses the Internet browser



as the communication media to share information with the Employer.

- b) All the data formats or standards must be supported by Microsoft Internet Explorer or other web browser (latest version) running on latest version of Windows.
- c) The following lists the file types and the corresponding data formats to be used on the Internet. The Contractor shall comply with them unless prior consent is obtained from the Employer's Requirement for a different Data format:

File Type	Data Format
Photo Image	Joint Photographic Experts Group (JPEG)
Image other than Photo	GIF or JPEG
Computer Aid Design files (CAD)	Computer Graphics Metafile (CGM)
Video	Window video (.avi)
Sound	Wave file (.wav)

- 6.0.8** The following states the standards to be used on Internet when connecting to database(s). The Contractor shall comply with them unless prior consent is obtained from the Employer's requirement for a different standard:

Function to be Implemented	Standard to be Complied With
Database connectivity	Open Database Connectivity (ODBC)
Publishing hypertext language on the World Wide Web	Hypertext Markup Language (HTML)

The hard copy of all documents shall be the Contractual copy.

6.1 Building Information Modelling (BIM)

The Contractor shall get Civil & Architecture BIM Model of the Depot Building using software REVIT 2017 or latest. The Eqpt Contractor shall incorporate his BIM model of the Equipment in the Civil & Architecture BIM Model using software the same software. Wherever Civil & Architecture Mode of the Depot Building

is not available, the Contractor shall submit the BIM model of the Equipment after finalization of the design.

The BIM Model of the Equipment shall include foundation, trenches, cable ducts and all parts of the Equipment etc. whichever is applicable. Notice of No Objection of REVIT model shall be obtained by the Contractor from Project Manager.

6.2 General Requirements

6.2.1 General

- a) The Contractor shall adopt a title block similar to that used in the Drawings for all drawings prepared under the Contract.
- b) Each drawing shall be uniquely referenced by a drawing number and shall define both the current status and revision of the drawing.
- c) The current status of each drawing shall be clearly defined by the use of a single letter



code as follows:

- P - Preliminary Design Drawing
- F - Final Design Drawing
- B- As Built Drawing

6.2.2 Types of Drawing

- a) "Design drawings" mean Preliminary or Final Design drawings.
- b) "As-built drawings" show the Works exactly as constructed or installed. They are usually prepared by amending the working drawings to take in to account changes necessitated by site conditions and described in Site drawings. These drawings shall be completed on a regular basis as the works progress and shall not be left until completion of the entire works.

6.3 Computer Aided Design & Draughting (CAD) Standards

6.3.1 Introduction: Data input procedures between the Project Manager and Contractor must be coordinated, and the key parameters used to form CAD data files must be standardized. The production of all CAD data files shall comply with the following requirements.

6.3.2 Objectives: The main objectives of the CAD standards are as follows:

- a) To ensure that the CAD data files produced for Project are coordinated and referenced in a consistent manner
- b) To provide the information and procedures necessary for a CAD user from one discipline or external organization to access (and use as background reference), information from a CAD Data file prepared by another discipline or external organization.
- c) To standardize the information contained within CAD data files which may be common to More than one discipline such as drawing borders, title boxes, grid lines, etc.
- d) To establish procedures for the management of CAD data files.
- e) To ensure all Contractors use "Model space" and "Paper space" in the production of their CAD files.

6.3.3 Terminology & Associated Standards / Guidelines

Any terminology used within this section that is ambiguous to the user shall be clarified with the Employer's Requirement. British Standard BS1192 is used in principle as a guide for drawing practice, convention, CAD data structure and translation.

6.3.4 Paper Drawings

- a) For the Project "Paper" drawings are considered to be the main vehicle for the receipt and transmittal of design and production information, typically plans, elevations and sections.
- b) The Project wide accepted media for the receipt and transmittal of "Paper" drawings will be paper and polyester film of various standards ISO "A" sizes. The composition of this information shall be derived from a CAD "Model".
- c) The CAD derived "Paper" drawing composition will reflect a window of information contained within a CAD "Model Space" file together with a selection of information contained within the associated CAD "Paper Space" file.

6.3.5 CAD Data Creation, Content & Presentation



A consistent method of CAD data creation, together with content and presentation is essential. The method of CAD "Model Space and Paper Space" creation is as follows:

a) Model Space Files

Typically, CAD "Model Space" files are required for general arrangement and location plans and will consist of a series of other "Model Space" referenced CAD files covering the total design extents at a defined building level (the number of referenced files should be kept to an absolute minimum). Data contained within a CAD "Model Space" files is drawn at full size (1:1) and located at the correct global position and orientation on the Project Grid / or defined reference points.

Each CAD "Model Space" file will relate to an individual discipline. Drawing border / text, match / section lines or detailed notation shall NOT be included within a CAD "Model Space" file. Dimensions shall be included within a CAD "Model Space" but located on a dedicated layer. Elevations, Long Sections and Cross Sections shall also be presented in CAD "Model Space" as defined above, but do not need to be positioned and orientated on the Project Grid.

b) Paper Space CAD Files

"Paper Space" CAD files are utilized to aid the process of plotting "Paper" drawings and are primarily a window of the CAD "Model Space" file. A "Paper Space" CAD file will typically contain drawing borders, text, match or section lines & detailed notation. Once these files are initially set up and positioned, the majority of "Paper Drawing" plots at various approved scales are efficiently and consistently generated by displaying different combinations of element layers and symbology contained within the "Paper Space" file and the referenced "Model Space" files.

The purpose is to ensure that total co-ordination is achieved between the CAD "Model Space" file and the "Paper Drawing" output during the revision cycle of the design and production process. Duplicated data in "Model and Paper Space" files will not be acceptable unless an automatic update link exists between the two data sets. "Paper Space" files are not typically required as part of the CAD Media Receipt from Contractors, unless specifically requested.

6.3.6 CAD Quality Control Checks

Random CAD Quality Control Audits will be carried out by Project Manager on all CAD media received and transmitted.

In addition, all Contractors who transmit and receive CAD data from the Project shall have CAD quality control procedures in place. A typical quality control procedure shall contain CAD data quality checking routines coupled with standards for CAD data transmittal and archiving.

6.3.7 CAD Data Transfer Media and Format

When CAD data is received & transmittal between Project Manager and the Contractor, the media shall be as follows:

- a) Data Exchange Format - AutoCAD (latest) (.DWG).
- b) Operating System - / Window NT 4 /Windows2007/2010 (latest version)
- c) Data Transfer Media: DVDs / Hard Disc (or other better means)



All media must be labeled on the data shield with:

- Name of Company
 - Project Title
 - Drawing Filenames (for diskettes only)
 - Diskette No. / Total No. of diskettes or Tape No. / Total No. of Tapes
- d) All media shall be submitted with a completed Form (CAD Disk/Tape Sheet).
- e) The Contractor must ensure the supplied media is free from virus.
- f) Sub-directories on tapes or disks are not permitted. If CAD Data is created using UNIX, archive commands must be uprooted.

6.3.8 CAD Media Receipt & Transmittal

- a) CAD Media Transmittal (from the Contractor to Project Manager) - this will consist of the following:
- i. CAD Digital Media (disk(s), CD's) shall typically contain CAD "Model Space" and "Paper Space" files.
 - ii. CAD data sheet
 - iii. CAD issue / revision sheet
 - iv. CAD Quality Checklist confirming compliance.
 - v. Plot of each "Model Space" file issued on an A1 drawing sheet (to best fit).

b) The above CAD media will be collectively known as "CAD Media Transmittal Set". The CAD data file transmittal format required by Employer' Representative from all Contractors shall be in AutoCAD version as stated in Clause 6.1.5 above.

c) All CAD media received from Contractors will be retained by Project Manager except for SCSI disk (if used) as an audit trail / archive of a specific Contractor's design evolution.

d) CAD Media Receipt (from Project Manager to the Contractor)

CAD media should normally be obtained from the respective Interfacing Contractor(s), but should Project Manager issue CAD media it will consist of the following:

- i. CAD Digital Media (disk (s) or tape (s)) typically contain only CAD "Model Space" files.
 - ii. CAD data sheet
 - iii. CAD issue / revision sheet
- e) The above CAD media will be collectively known as the "CAD Media Receipt Set". The CAD Data file transmittal format used by Project Manager to all Contractors will be in AutoCAD version as stated in Clause 6.1.5 above.
- f) Each CAD transmittal disk / tape will be labeled with proper disk label as approved by the Project Manager. Any CAD data transmitted without this label is assumed to be provisional information not to have been quality checked and therefore not formally issued.

6.4 Revisions

6.4.1 All „Revisions“, „In Abeyance“ and „Deletions“ shall be located on a common layer. This layer can be turned on or off for plotting purposes.

6.4.2 The following example text indicates the current CAD file revision, i.e. "Revision [A]". This shall be allocated to a defined layer on all CAD "Model Space" files, in text of a size



that will be readable when the CAD "Model Space" file is fitted to the screen, with all levels on.

6.5 Block Libraries, Blocks, & Block Names

6.5.1 All Construction Industry symbols produced as CAD Cells shall typically conform to British Standard BS1192 - part 3.

6.5.2 All Blocks created shall be Primitive (i.e. NOT Complex) and shall be placed Absolute (i.e. NOT Relative).

6.5.3 The Contractor's specific block libraries shall be transmitted to Project Manager together with an associated block library list containing the filename (max. 6 characters) and block description. The Contractor shall ensure that the library is regularly updated and circulated to all other users, together with the associated library listing.

6.5.4 All Blocks created will typically be 2D unless 3D is specifically requested. In both instances, they shall have an origin at a logical point located within the extents of each Block's masked area or volume.

6.6 CAD Dimensioning

Automatic CAD Dimensioning will be used at all times. Any dimensional change must involve the necessary revision to the model space file. If the CAD Quality Control Checks find that the revisions have not been correctly carried out, the rejection of the entire CAD submission will result.

6.7 CAD Layering

All CAD elements shall be placed on the layers allocated for each different discipline. The layer naming convention to be adopted by the Contractor shall be submitted for acceptance and inclusion within these standards.

6.8 Global origin, Location & Orientation on the Alignment Drawing

- a) Location or Plan information in "Model Space" files shall coincide with the correct location and orientation on the Project grid for each specific Contract.
- b) Location plans shall have at least three setting out points shown on each CAD "Model Space" file. Each setting out point shall be indicated by a simple cross hair together with related Easting and Northing's co-ordinates. The Civil Contractor(s) will establish the three setting out co-ordinates for their respective works, which will then be used by all other Contractors including the Contractor.

6.9 CAD Utilization of 2D & 3D Files

Although the project standard is 2D CAD files, certain disciplines and Contractors may use 3D CAD files for specific applications or where the isolated use of 3D aids the design and visualization process (i.e. Architecture, Survey and Utilities). In these specific instances 3D CAD data will only be transmitted if all other users can use this data. If this is not the case, 3D to 2D translation shall be processed by the creator prior to issue.

6.9.1 CAD File Naming Convention – General

CAD "Model Space" files shall be named in accordance with general drawing conventions.

----- End of Appendix 6 -----



APPENDIX 7- List of Deliverables by the Contractor

7.0 Schedule of Items to be submitted by Contractor:

This Appendix- of Part 2, Section VI-A compiles the principal items to be submitted by the Contractor to the Project Manager. This list is not exhaustive and the Contractor is reminded to satisfy itself of the requirements for all submissions whether or not they are included within this Appendix.

Sr No.	Article	Reference Clause in Respective Chapter	To be Submitted
1	Works Program (includes Design, Manufacturing, Manufacturing Testing, Delivery, Installation, Testing & Commissioning Program)	2.2	Within 35 days of the Effective Date
2	Quarterly Progress Report	2.9	Every Quarter
3	Quality Plan	3.5	Within 56 days of the Effective Date
5	Safety Plan	3.7	Within 56 days of the Effective Date
6	Manufacturing Testing and Delivery Plan	3.8	Within 56 days of the Effective Date
7	Preliminary Design & Drawings including foundation drawing and Report if any	3.4.1 & 3.4.2	Within 56 days of the Effective Date
8	Final Design & Drawings including calculation and Report if any	3.4.1 & 3.4.2	Within 84 days of the Effective Date
9	3- D BIM model of Equipment	6.2 of Appendix 6	Within 84 days of the Effective Date
10	Submission of technical for Obtaining sanction of statutory authorities (if applicable)	As required by PM	Within 434 days of the Effective Date
11	As Built/ Manufactured Drawings	5.9	Within 434 days of the Effective Date
12	Spare parts Catalogue	14.8	Within 434 days of the Effective Date
13	Installation, Testing & Commissioning Plan	3.10	Within 84 days of the Effective Date
14	Training Manual	3.11	Within 84 days of the Effective Date
15	Operation and Maintenance Manual	5.9, 12.2,12.3 & 12.4	Within 434 days of the Effective Date
16	Maintenance Plan	3.12	Within 434 days of the Effective Date

----- End of Appendix 7 -----



APPENDIX 8- General Electrical Requirements

8 General Electrical Requirement

8.0 Motors:

- 8.0.1 The protection level of the motors shall be at least IP 55 for internal and IP 65 for external motors unless mentioned otherwise in Technical Specifications, Section VI-B, Part 2.
- 8.0.2 These shall be ventilated and specially designed for duty ratio and start-ups per hour as per equipment group and shall be fitted with a built-in under voltage electric brake, wherever required.
- 8.0.3 The Contractor shall specify, but not limited to, the following details:
- a) the brand,
 - b) the type,
 - c) the insulation class,
 - d) the power,
 - e) the nominal rotation speed,
 - f) the current input at start-up,
 - g) the current input under nominal load,
 - h) the construction of the rotor, stator winding
 - i) the type of brake,
 - j) the nominal braking torque.
- 8.0.4 The motors shall be sized such as to withstand the start-up forces and sudden braking and accidental blocking forces without damage. They shall be protected on all three phases. The Contractor may also propose a variable power supply wherever felt advantageous.
- 8.0.5 The control gear for AC/DC motors shall incorporate the following protection devices as concomitant accessories.
- a) **No Voltage Protection** - No voltage protection shall be provided so that Plant will not start up again by itself when, following an interruption, the supply is restored.
 - b) **Short Circuit Protection** - To protect against short circuits due to insulation failure of faulty connections, HRC fuses shall be provided for each motor. The rating of the fuse shall be such so as to take care of the over current due to motor starting.
 - c) **Overload Protection** - To prevent motors from overloading, overload protection shall be provided separately for each motor. Three phase motors shall be protected by overload tripping devices on each phase.
 - d) **Single Phasing Protection** - A separate current sensitive delayed action single phasing preventer shall be provided for each motor separately. Overload protection shall not be treated as single phasing preventer.
- 8.0.6 Emergency stop push buttons shall be provided and positioned in the immediate vicinity of the associated motor drive.
- 8.0.7 Emergency stop push buttons shall be connected in the control circuits such that they are effective under all conditions and shall have red mushroom headed stay put on push type pattern. A deliberate reset action shall be required before the drive can be put back into service but resetting of the push button shall not restart the drive.
- 8.0.8 Main drive motor starters shall be suitable for their required frequency duty in line with this Particular Specification. Other motors starters shall also be suitable for their required frequency duty but in no circumstance shall the frequency duty be less than 40 operations



per hour. Their performance shall be in accordance with BS EN 60947-4-1. Protective, control, interlock and alarm relays shall be placed in positions readily accessible during operation of the plant.

8.1 Electrical cabinet:

- 8.1.1 Material for electrical cabinet shall be stainless steel grade. Cubicles shall be symmetrically arranged as far as possible
 - 8.1.2 The arrangements of the equipment within each cubicle shall be such that all normal maintenance can be carried out through hinged access doors or removable covers from the front.
 - 8.1.3 Where a number of different items are in close proximity, the enclosure shall be grouped to form a single suite, or a composite enclosure shall be provided.
 - 8.1.4 Each suite of panels or cubicles shall be fitted with a designation label giving identification number, voltage rating and duty. Such labels shall be fitted on the front of the cubicle, and on the sides and/or rear where appropriate.
 - 8.1.5 All electrical and electronic equipment/components used in the plant shall be designed (power, control, regulation, etc.) for use in outdoor application in very rough environmental conditions of Mumbai and shall be contained in a dust and water splash tight cabinet and shall be at least IP 56.
 - 8.1.6 The design of cubicles shall be such as to ensure adequate ventilation and air circulation without permitting the entry of vermin. Dust penetration shall be kept to a minimum by the fitting of recessed rubber seals around doors and removable panels.
 - 8.1.7 Cubicles shall be provided with flush front access doors fitted with lockable handles and lift-off type hinges so arranged that one shank engages before the other to permit ease of fitting. No instruments or relays shall be mounted on the doors unless otherwise specified.
 - 8.1.8 Control wiring within the cubicles shall be neatly looped or contained in purposely designed trunk
 - 8.1.9 trunk unless every cable is insulated for the highest voltage present in accordance with the requirements of BS 7671.
 - 8.1.10 The front door of all cubicles shall only be opened when the functional unit is shut off.
 - 8.1.11 Live panel wiring terminations shall have a protective cover and warning labels. Where the voltage exceeds 110V DC or AC, danger signage with suitable labels shall be fitted to give warning of the potentials contained therein. Where applicable, labels shall be fixed adjacent to the warning label advising isolation and earthing of conductors before removal of the panel. The wording of the labels shall be subject to the approval of the Employer's Representative.
- 8.2 Electrical cabinet equipment:**
- 8.2.1 Component layout within panels shall provide a logical arrangement of equipment with the maximum feasible segregation between mains voltage/ high current and low voltage/ low current components and wiring.
 - 8.2.2 All components within control panels shall be either directly mounted on the back plate by means of screws in tapped holes or onto a "DIN" type mounting rail itself directly mounted on the back plate by means of screws in tapped holes. The arrangement shall be got approved first by the Employer.
 - 8.2.3 For incoming and outgoing power cabling this space shall be increased as necessary to ensure that the bending radius of the conductors is not compromised and segregation between power cabling and control cabling is preserved.



- 8.2.4 Wiring shall be carried out in a neat and systematic manner and securely fixed by insulated cleats or other approved methods and arranged so that access to any apparatus or connection point is not impeded.
- 8.2.5 Where inter-panel wiring passes through panel side sheets, the access hole shall be fitted with a suitable rubber grommet.
- 8.2.6 Identification ferrules shall be fitted on all wires at both ends; numbers and letters used shall correspond with the appropriate wiring diagram and shall be read from the terminal's outwards. They shall be legible and durably marked and shall not be affected by oil or moisture. All cables connected to any nodal point shall be allocated with a discrete number which must not be used elsewhere in the associated circuits.
- 8.2.7 The wires shall not be jointed or broken in between terminal points.
- 8.2.8 Wiring for all known future equipment shall be provided and all wires shall be terminated.
- 8.2.9 All control circuit supplies for contactor starting shall be obtained from a 110V internal control transformer contained in the cubicle.
- 8.2.10 All the equipment may be required to operate in electrified railway environment. It shall, in such cases, be protected against the following effects: i) the numerous disturbing phenomena due to the proximity of high amperage current liable to be working in switching mode, ii) the proximity of equipment generating high frequencies (converters, etc.) various parasitic disturbances, and against power supply anomalies such as: high ripple ratio, high over-voltage, slow voltage or frequency variations, etc.
- 8.2.11 All components, and in particular the relays, shall be of the high endurance type whose high degree of reliability shall allow normal operation of the Equipment over a period of 10,000 (ten thousand) hours necessary.

----- End of Appendix 8 -----



APPENDIX 9- General Mechanical Requirements

9 General Mechanical Requirement

9.1 Materials - General:

9.1.1 All materials incorporated in the Works shall be suitable for the duty concerned and shall be new and of best commercial quality, free from imperfections, and selected for long life and minimum maintenance under the conditions specified.

9.2 Workmanship - General:

- a) Workmanship and general finishes shall be of best quality and in accordance with best engineering practice.
- b) All similar items of Plant and their component parts shall be completely interchangeable.
- c) All revolving parts shall be truly balanced both statically and dynamically so that when running at normal speeds and at any load up to the maximum, there shall be no excessive vibration due to out-of-balance forces.

9.3 Materials and Ancillaries:

9.3.1 Structural Steel Sections:

- a) Hot rolled structural steel section shall comply with BS 4: Part 1.
- b) Corrosion protection shall be by hot dip galvanization with minimum thickness of coating of 85 micron.

9.3.2 Mild Steel:

- a) Mild steel for general purposes shall conform to the requirement of BS: 4360.
- b) Steel parts shall be galvanized as appropriate to approved standards and as specified above. Uncoated or non-corrosion resistant steel parts shall not be used unless otherwise approved by the Employer's Representative.

9.3.3 Steel Castings and Forgings:

- a) All steel castings shall conform to the requirements of BS: 3100. Forgings shall conform to BS: 29.
- b) No repair shall be undertaken without prior approval by the Employer's Representative. Repairs by welding to steel castings and forgings shall be undertaken only by properly qualified welders and in full accordance with an approved procedure. All such repairs shall be subject to stress relief.

9.3.4 Corrosion Resistant Steel:

- a) Unless otherwise specified or approved by the Employer, stainless steel tubes, sheets and plates used in this Contract shall be in accordance with the following Standards: -
Austenitic stainless-steel tubes shall comply with BS 6323: Part 1 and 8. Stainless and heat-resisting steel plates, sheet and strip shall comply with BS 1449: Part 2, grade 304 unless otherwise specified.
- b) Stainless steel shall have good arc-welding properties and low carbon content. Stainless steels adversely affected by welding shall not be used. There shall be no visible welding marks on the exterior surface.

9.3.5 Bronze:

Bronze castings for bearings, packing boxes, and similar applications shall be of the phosphor bronze type to BS 1400.



9.3.6 Copper:

- a) Copper tubing shall be of the seamless type to BS 2871.
- b) Copper for electrical purposes shall conform to the requirements of BS1432-4 and BS 1977 as appropriate for the duty.

9.3.7 Brass:

Brass tubing shall be of the heavy gauge seamless type and shall comprise 70%, copper, 29% zinc and 1% tin.

9.4 Welding and Fabrication:

These Clauses on welding refer to fabrications in mild steel. If the Contractor supplies any equipment welded from other metals, he shall propose the relevant welding standards and procedures for the acceptance of the Employer.

9.4.1 Distortion and assembly:

- a) Metal arc welding shall comply with the provisions of BS EN 499 and BS 5135 or equivalent. The temperature of steel shall be more than 10°C when welding is commenced. Finished members shall be true to line and free from twists, bends and open joints.
- b) During the fabrication of a welded assembly, the procedure and sequence shall be such as to minimize distortion and shrinkage. All welds shall be deposited in a sequence that will balance the applied heat as welding progresses.
- d) The design of welded joints and connections, and the fabrication of welded steel parts shall conform to the requirements of an acceptable British Standard or equivalent for structural steelwork and shall also be stress relieved to an acceptable British Standard or equivalent if required. If stress relieving is used, then the Contractor shall ensure that no distortion arises as a result of the process and that the finished size of the equipment is within the required tolerances.
- e) Any welding of steel castings to the framework shall conform to BS 4570 or equivalent.

9.4.2 Equipment:

- a) Electrodes, fluxes and equipment shall be used in accordance with the manufacturer's instructions. The use of welding processes, other than those covered by BS 5135 or equivalent will be subject to be reviewed and acceptance by the Client's Representative. Welding electrodes for manual electric arc welding shall be of the heavily coated type, suitable for all positions of welding.

9.4.3 Quality assurance:

- a) Procedures in line with ISO 9000 or equivalent shall be followed as part of the Quality Plan for all welding procedures and welder certification. These procedures and certifications shall be in line with BS EN 287 and BS EN 288 or equivalent.
- b) Welding shall be carried out by qualified welders only. Welding procedures and welder certificates in accordance with BS EN 288 and BS EN 287 or equivalents shall be followed by the Contractor

9.5 Gearboxes and Gearing:

- a) All gears shall be heat treated for maximum wear and fracture resistance.
- b) Gearboxes shall be designed such that the gears will be automatically lubricated at all operating speeds. The box shall prevent escape or contamination of the lubricant.



Breathing shall be provided. Where oil replacement is necessary, facilities for filling, drainage and means of indicating clearly the correct oil level shall be provided.

9.6 General Hydraulic Requirements:

9.6.1 General:

- a) Hydraulic power transmission systems, if provided, shall be constructed in accordance with BS: 4575 or equivalent.
- b) The hydraulic system shall be equipped with the following protection devices:
 - i) Overheating
 - ii) Overpressure
 - iii) Low oil level
 - iv) Surge protection if required
- c) The hydraulic oil proposed shall have characteristics suitable for the intended duties and be compatible with all the components and elastomers used in the system. The oil shall be of appropriate viscosity, correct specific gravity and have good oxidation resistance and good anti-foaming properties. The oil shall not be classified as dangerous goods.
- d) The system shall be designed to ensure that any tripping or transient operation does not result in surge pressures that could cause damage to the system.
- e) The Contractor shall advise Indian equivalent of lubricant & hydraulics oil used in the Equipment.

9.6.2 Hydraulic Cylinders and Rams:

- a) All hydraulic cylinders and rams shall be designed to sustain axial forces resulting from a pressure equal to 2.5 times the full load pressure.
- b) The piston rod shall be constructed of austenitic stainless steel, which is chrome plated and polished. Alternate materials of better quality and latest practice can be used with the approval of the Employer.

9.6.3 Hydraulic oil storage tanks:

- a) Oil storage tanks shall have sufficient capacity to provide an adequate oil reserve to prevent the entrance of air or other gas into the system. They shall be of rigid construction so as to prevent distortion due to the weight of oil.
- b) A transparent indicator of approved design shall be provided for checking the oil level and it shall be accessible without the need to remove any cover or other parts of the equipment.
- c) A manually sealable drain valve shall be provided at a position to facilitate the complete draining of oil from the tank.

9.6.4 Hydraulic pipe work and fitting:

- a) All pipe work shall be provided in stainless steel. Cross-sectional areas of pipe work shall be sufficient to prevent cavitation and starvation.
- b) Hydraulic hoses shall be of adequate strength and be suitable for the type of oil used. The installation of hoses shall be such as to avoid the use of sharp bends and chafing or trapping by moving parts of the Equipment.
- c) The relief valve pressure setting shall be as low as practical, commensurate with the operating requirements and shall not be greater than 125 (one hundred twenty-five)



percent of the working pressure of the pump, in order to avoid damage to the motor and hydraulic system.

- d) The system shall incorporate continuous full flow removable oil filters. All filters shall have integral bypass valves and provisions for visual and electrical indication of blockages.
- e) All filters shall be installed where they are readily accessible and adequate space shall be allowed for element changing. Where suction filters or strainers are used, they shall be accessible for maintenance without draining the oil tank.

9.6.5 Screws, Springs and Pivots:

- a) The use of iron and steel for screws, springs and pivots in the Equipment shall be avoided as far as possible. All fixing screws shall be of stainless steel of SS 316.
- b) Springs shall be of non-rusting material (e.g. phosphor bronze or nickel silver) where possible.

9.6.6 Bolts, Studs, Nuts and Washers:

- a) All bolts, studs and nuts shall be to an approved Standard and to metric dimensions and shall generally be of stainless steel. Those subject to vibration, high temperature or pressure shall be of high tensile material.
- b) Nuts, bolts, tap-bolts, set pins and any other item subject to vibration shall be secured with Approved locking devices

----- End of Appendix 9 -----



BIDDING DOCUMENTS



MUMBAI METRO LINE 3 (COLABA-BANDRA-SEEPZ)

CONTRACT MM3-CBS-DEQ-9-02

Design, Manufacture, Supply, Installation, Testing & Commissioning
and Comprehensive Maintenance Service of
Automatic Train Wash Plant
for Project "Mumbai Metro Line-3"

Part 2 Employer's Requirements

Section VI B Technical Specifications

January - 2020

**Mumbai Metro Rail Corporation Ltd
MMRCL Line 3 Transit Office,
Wing A, Block E,
Bandra-Kurla Complex,
Bandra (East), Mumbai- 400 051, India.**



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BIDDING DOCUMENTS

Composition of Documents

Part 1	Bidding Procedure
Section I	Instructions to Bidders
Section II	Bid Data Sheet
Section III	Evaluation and Qualification Criteria
Section IV-A	Bidding Forms
Section IV-B	Pricing Document
Section V	Eligible Source Countries of Japanese ODA Loans
Part 2	Employer's Requirements
Section VI-A	Employer's Requirements – General Specifications
Section VI-B	Employer's Requirements – Technical Specifications
Part 3	Conditions of Contract and Contract Forms
Section VII	General Conditions of Contract (GC)
Section VIII	Particular Conditions of Contract (PC)
Section IX	Contract Forms
Section X	Special Conditions for Comprehensive Maintenance Service Contract
Part 4	Drawings
Section XI	Drawings



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Contents

Technical Specifications	1
1. General Description of the Works	1
2. Project and Permanent Works	1
2.1 Location and Boundaries	1
2.2 Design Responsibility	1
2.3 General Design Requirements:	2
2.4 Safety of Equipment	4
2.5 Use of drawings and data	4
2.6 Finish and Painting	5
2.7 Training	5
2.8 Noise Level:	6
2.9 Equipment Maintenance during DLP and post DLP: Refer Clause 4 of this Specification.	6
2.10 Major Items of Service from Sub-Contractors/Agencies:	6
2.11 Functional Guarantees- Reliability, Availability, Maintainability	6
3. Technical Particulars- Automatic Train Wash Plant	8
3.1 Detailed Scope of Works	8
3.2 Specific requirement of Automatic Train Wash Plant:	8
3.3 Operating Principle of Automatic Train Wash Plant:	10
3.4 Plant Capacity:	12
3.5 Plant Assemblies:	12
3.6 Plant Layout:	13
3.7 Reference Data of Coaches:	13
3.8 Washing Process Station:	13
3.9 Control Console	16
3.10 Signage:	17
3.11 Connection to Fresh Water Tank:	18
3.12 Wash Apron:	18
3.13 Connection to Effluent Treatment Plant:	18
3.14 Remote Surveillance System:	18
3.15 Spray Nozzles:	19
3.16 Brushes:	19
3.17 Pumps:	20
3.18 Piping and Steel Work:	20
3.19 Electrical /Electronic Equipment:	21
3.20 Maintenance Provision:	21



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3.21	Checks and Tests	22
3.22	Delivery:	23
3.23	Protection and Safety:	23
4	Comprehensive Maintenance Service during DLP and Post-DLP:	24
4.1	General Maintenance Requirements	24
4.2	Items of attention during CMS- Wash Plant	26

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Technical Specifications

1. General Description of the Works

- 1.1 The Works shall comprise, but not limited to, the Design, Manufacture, Supply, Installation, Testing & Commissioning and Comprehensive Maintenance Service of

One (01) number of Automatic Train Wash Plant

that will be located at Metro depot of Mumbai Metro Line 3 Project. The detailed technical specifications of the above lots are given in this Section in Clause No 3.

- 1.2 The supply shall include all equipment and accessories even if not particularly mentioned but are considered necessary to for satisfactory completion of the Work to meet with the specified operating conditions.

2. Project and Permanent Works

The Mumbai Metro line 3 comprises of 33.6 Km long underground metro rail with 26 underground and one at-grade stations. The traction system will be 25 KV single phase, 50Hz, AC overhead traction system. The track will be standard gauge (1435 mm).

There will be one depot to stable, maintain and despatch the trains. Line 3 will be provided with communication-based Signalling and Train Control. Initially trains will be operated with train operator on board, but system shall be designed so that later it can be upgraded to GoA4 level Unattended Train Operation (UTO) with ultimate design headway of 90 seconds.

The Rolling Stock will be of 3.2-metre-wide air-conditioned cars. The trains, of 8-car configuration (DT+M+M+M+M+M+M+DT), shall be capable of sustaining a maximum service speed of 85 KMPH with a permissible speed of 95 KMPH.

2.1 Location and Boundaries

The location plan together with the indicative works and Site area boundaries are shown on the Drawing 1, Section XI, Part IV in the Tender Document. The Interfacing Depot Civil Contractor shall set out the Works and Site area boundaries of the Contract.

2.2 Design Responsibility

The Contractor shall be responsible for the design of the permanent Works, which shall include but not be limited to the following-

- 2.2.1 The development of the design shall be carried out in conjunction with the information contained in the Drawings and shall be in accordance with the Technical Specifications set out in the Contract. The Contractor shall obtain design approval from the Project Manager before starting the manufacturing of the Equipment to be supplied under the Contract.
- 2.2.2 The Contractor will be responsible for the development and completion of the design of any other items of the Works as stated in the Contract, including, without limitation, the updating and amendment of the Drawings from time to time.
- 2.2.3 The Contractor, co-ordinating with the Project Manager and Interfacing Contractors on all matters relating to design and documentation, shall retain full responsibility for managing



such design and for the maintenance of all documentation associated with the design process.

- 2.2.4 The Contractor shall determine and verify as appropriate the materials, site measurements and installation criteria before adopting in the design of the equipment.
- 2.2.5 The Contractor shall ensure that the information contained in the submissions has been coordinated with the overall requirements of the Works and the works of the Interfacing Contractors.
- 2.2.6 The information that is extracted from the Drawings and adopted by the Contractor in his design shall become the Contractor's design for which neither the Employer nor the Project Manager shall be responsible.
- 2.2.7 The Contractor's designs, whether for Temporary Works or Permanent Works are required to be submitted to Project Manager for Notice of No Objection (NoNO). The Contractor shall make all due allowances for the requirements of the Project Manager's consent process in the Works Programme and in the timing of the Works.
- 2.2.8 Responsibility for the Contractor's design proposals submitted to the Project Manager shall remain with the Contractor who must provide sufficient resources to deal with subsequent questions, alterations etc. requested by the Employer. All communications with the Employer whether written or oral, must be copied/ recorded to the Project Manager.
- 2.2.9 The Plant shall be designed for more than 30-year design life for foundation, base frame and structural components as well as more than 15-year design life for mechanism, driving components, spray poles, brushes (except bristles) and others of the Plant. No major structural repairs and major component replacement shall normally be required during the respective design life.
- 2.2.10 The Contractor may engage local subcontractor/ agency for installation related works at site subject to NoNO by the Project Manager. The Contractor shall solely be responsible for design, quality of its installation and shall issue quality certificate for the same.
- 2.2.11 All steel used by the Contractor shall be established to have adequate corrosion resistance.

2.3 General Design Requirements:

The following general requirements on equipment design shall apply to all equipment:

- 2.3.1 The Equipment shall be designed to suit the Rolling Stock and Track to be provided in the Project. The relevant parameters of Rolling Stock and Track are given below for reference purpose only. The Contractor shall reconfirm the required parameters from the Interfacing Contractors before finalization of the design of the Equipment.

TENTATIVE ROLLING STOCK and TRACK PARAMETERS

Rolling Stock Parameters:

- | | |
|------------------------------|---------------|
| a) Width of Car | : 3200 mm |
| b) Length of Car (MC/TC) | : 22240 mm |
| c) Length of Car (DTC/DMC) | : 22600 mm |
| d) New Wheel Diameter | : 860mm |
| e) Fully worn Wheel Diameter | : 780mm |
| f) Height of coupler | : 740- 815 mm |



Track Parameters:

- a) Gauge : 1435 mm
 b) Max Axle load : 17 tons
- 2.3.2 Work related to the production of the equipment shall comply with the relevant Indian Standards or European Standards, Codes of Practice and latest Statutory Requirements of India, as given in Table 1 below:

Table 1- List of Standards & Codes of Practice

Sr No	Standard	Description
1	BS EN ISO 4413:2010	Hydraulic fluid power. General rules and safety requirements for systems
2	IS 8623/1977	Factory built assembly switch gear and control gear
3	IS 4460/1967	Specifications for gears
4	IS 3028	Sound Level
5	ISO 1217	Displacement compressors - Acceptance tests-09/1996.
6	ISO 1711	Assembly tools for screws and nuts - Technical Specification - Hand operated wrenches and sockets
7	BS 5378	Safety colours and safety signs
8	BS EN 287	Approval testing of welders for fusion welding
9	BSEN 288	Specification and approval of welding procedures for metallic materials
10	BS 5304	Code of practice for safety of machinery
11	BS 5395	Stairs, ladders and walkways
12	BS 5950	Structural use of steelwork in building
13	BSEN 60073	Specification for coding of indicating devices and actuators by colours and supplementary means
14	EN 60204	Electrical equipment
15	BSEN 60529	Specification for degrees of protection provided by enclosures (IP code)
15	EN 954-1	Safety for Control System
16	IS 325	Electric Motor
17	ISO 9001-3:1991	Guideline for the Application of ISO9001 to the Development, Supply and Maintenance of Software.



- 2.3.3 The Equipment shall be designed and/or selected to allow intermittent operation without over stressing, damaging or interfering in any way whatsoever with other equipment in the Depot.
- 2.3.4 The Contractor shall, to the extent that he is responsible for the design or for the selection of particular components of equipment items, recognise and implement all safety requirements and ensure that the design and performance of the equipment are compatible with the appropriate international safety standards and ambient conditions specified.
- 2.3.5 The electrical components, control panel and Switch Boards if applicable shall have IP 56 for installations inside the plant room and IP 66 protection level for installations outside the plant room.
- 2.3.6 Equipment shall be "fail-safe" and "overload protected". The equipment shall incorporate all necessary safety devices to protect the equipment, operators, and all other people and things in the vicinity of the equipment. No failure of the equipment shall cause or give rise to any damage or catastrophe of any nature whatsoever.
- 2.3.7 Equipment design shall take into account considerations of fire protection, elimination of dust and dirt by means of suitable traps or the like, minimum maintenance requirements and ease of access for cleaning, routine maintenance and general disassembly.
- 2.3.8 The lowest nozzles of spray poles shall be at such a height so that mist /water does not trickle down to the underframe parts of train.
- 2.3.9 Moving parts of the equipment shall be efficiently lubricated to ensure quiet operation as well as durable and reliable life. Lubrication points shall be clearly identified for easy replenishment with minimum removal of other equipment components.
- 2.3.10 The design of the Equipment shall incorporate predictive maintenance systems so as to reduce dependence on manual inspection, checking and intervention.

2.4 Safety of Equipment

The Contractor shall identify all safety aspects related to the use, operation, maintenance and stabling of the Equipment including, but not limited to, the following aspects (as applicable):

- a) Requirements for personal protective equipment;
- b) Safety instructions and control measures for hazardous situations;
- c) Uncontrolled Equipment functions;
- d) Fire hazard elimination and containment;
- e) Failure of hydraulic or pneumatic systems (wherever applicable);
- f) Failure of power supply;
- g) Electrical earthing issues;
- h) Electrocution;
- i) Working in confined spaces, etc. whichever is applicable.

2.5 Use of drawings and data

- 2.5.1 All data in concern with the rolling stock and other systems written in this specification is for reference purposes only and is required to be confirmed before the design stage.



2.5.2 The compatibility of the Equipment with the rolling stock characteristics and other systems is the responsibility of the Contractor and he shall obtain the required data/ documents from the Interfacing Contractors.

2.5.3 The drawings shown on the plans define the operating conditions and are provided for indicative purpose only. These may be adapted by the Contractor only after consultation with the Project Manager.

2.6 Finish and Painting

2.6.1 Surface Treatment:

- The surface treatment of the Equipment shall be suitable for the working environment under the climatic conditions of Mumbai.
- External surfaces shall be subjected to brushing, degreasing and sand/shot/grit blasting. Thereafter a coat of anti-corrosion paint shall be applied. The thickness of this coat after drying shall not be less than 60 microns.
- Hollow parts shall be treated prior to assembly.

2.6.2 Painting:

- External and related parts shall be, after the surface treatment, given two coats of polyurethane lacquer with a dry unit thickness of at least 60 microns. The second coat shall be applied over the first coat when it is approximately half dry. The Contractor may use better solutions of latest technology with approval of Project Manager.
- The Contractor shall touch up at site any paint as may be necessary.
- The paint colour scheme shall be submitted to the Project Manager for his notice of No Objection.
- All rubbing parts or those to remain polished shall be covered with a coating designed to protect them from oxidation until such time as the Equipment enters the service.

2.6.3 Identification:

- A plate indicating the following shall be fixed on the Equipment at a suitable location
 - Name of manufacturer
 - Important technical particulars
 - Year of Manufacture
 - Serial Number
- A logo of MMRC shall be affixed at suitable location (s) on the Equipment.
- The Contractor shall submit the proposed scheme of identification to the Project Manager for his Notice of No Objection

2.7 Training

2.7.1 The Contractor shall provide comprehensive training on Operation & Maintenance of the Equipment to the Employer's staff to enable safe and efficient operation of the Equipment.

2.7.2 The Contractor shall provide hands on training to a batch of 4 to 6 staff of the Employer for minimum 40 hours (@ 8 hours per day) for Equipment at Mumbai Metro Line 3 Depot.



2.8 Noise Level:

The noise level of the Equipment during its operation shall not exceed 75 dB when measured at a distance of one meter from the machine. Minor variation to above limits is acceptable on the discretion of Employer.

2.9 Equipment Maintenance during DLP and post DLP: The Contractor shall be responsible for carrying out the Comprehensive Maintenance Service in accordance with Clause 4 of this Specification.

2.10 Major Items of Service from Sub-Contractors/Agencies:

The following are the major items of services in the Equipment:

- a) Installation, Testing & Commissioning
- b) Comprehensive Maintenance Services.

The Contractor shall, in respect of these items, propose the sub-contractors/ agencies of these items during design stage who satisfy the experience condition specified in Clause No 2.6, Section III, Part 1 for Notice of No Objection.

2.11 Functional Guarantees- Reliability, Availability, Maintainability

2.11.1 General

- a) The Contractor shall assure the Reliability, Availability and Maintainability figures in terms of MTBF, % Availability and MTTR respectively as stated in Clause 2.11.2, 2.11.3 and 2.11.4 respectively for the offered Equipment.
- b) The collection of data with respect to functional guarantees shall commence from the time of issuance of Operational Acceptance Certificate.
- c) The Response time to attend to the breakdowns shall be 12 hours. In case where the Response time ends between 2300 hrs to 0800 hrs next day, the same shall be treated to have been extended up to 0800 hrs next day.
- d) Other defects shall be attended to as early as possible in consultation with the Employer.

2.11.2 Reliability

- a) **Equipment Failures:** The Equipment shall not have more than 4 Failures in a year.
- b) A **Failure** is defined as an event leading to the Equipment being unable to perform its intended service on account of Design/ Manufacturing/ Material Defects/ Installation Defects/ flawed maintenance attributable to the Contractor for which the maintenance requirement is more than 24 hours from the time of handing over of the Equipment or more than 36 hours from the time of reporting the failure, to the Contractor's nominated agency for repairs, whichever is earlier for maintenance of the Equipment.
- c) A **Fault** is defined as an event leading to the Equipment being unable to perform its intended service on account of Design/ Manufacturing/ Material Defects/ Installation Defects/ flawed maintenance attributable to the Contractor for which the maintenance requirement is more than four (04) hours but less than twenty-four (24) hours from the time of handing over of the Equipment or less than 36 hours from the time of reporting the failure for maintenance whichever is less, to the Contractor's nominated agency for repairs. Every four (04) Faults in a year shall be counted as one Failure.
- d) Details of all failures and faults for even less than four-hour duration shall be recorded and analysed every quarterly.



- e) The Equipment shall have a Mean Time between Failures (MTBF) of 90 days taking every three faults as one Failure.
- f) Figures of MTBF shall be calculated at the end of every year on aggregate basis from the time of Operational Acceptance.
- g) MTBF shall be calculated as $MTBF = \frac{\text{Total Time} - \text{Total Down Time}}{\text{No of Failures}}$ during the period.

2.11.3 Availability

- a) The availability of equipment shall be at least 96%.
- b) This figure takes into consideration the time when the equipment is not available due to breakdown on account of Design/ Manufacturing/ Material Defects/ Installation Defects/ Maintenance defects attributable to the Contractor from the time of intimation to the Contractor's nominated agency for repairs.
- c) This does not include the time for routine and planned maintenance.
- d) The figures of availability shall be calculated as $\frac{\text{Total Time} - \text{Total Down Time due to Planned Maintenance} - \text{Total Down Time due to Failures and Faults beyond four hours}}{\text{Total Time} - \text{Total Down Time due to Planned Maintenance}}$. The Response time shall be treated as grace period, which will not count towards plant down time for up to four (04) failures per year.
- e) Figures of Availability shall be calculated at the end of every year on aggregate basis from the time of Operational Acceptance.

2.11.4 Maintainability

- a) The Time to Repair (TTR) is the time taken to repair the Equipment after handing over to the Contractor's nominated agency for repairs.
- b) The Mean Time to Repair shall be the average of all TTRs during the period of one year starting from the date of Operational Acceptance.
- c) The equipment shall have an MTTR of 24 hours.
- d) Figures of MTTR shall be calculated at the end of every year on aggregate basis from the time of Operational Acceptance.



3. Technical Particulars- Automatic Train Wash Plant

The Contractor shall undertake to comply with the requirements of "Design, Manufacture, Supply, Installation, Testing & Commissioning of One (01) number of Automatic Train Wash Plant and carry out its Comprehensive Maintenance Service during the DLP and for period of five (05) years post-DLP.

3.1 Detailed Scope of Works

The scope of the Works, in addition to those specified in the General Specifications and Clause No 1.3, includes the following:

- a) Design, Manufacture, Supply, Installation, Testing & Commissioning of Automatic Train Wash Plant at Metro Depot of Mumbai Metro Line 3. The supply shall include all equipment and accessories required to make the machine fully functional and meeting with all the Technical Requirements as specified in this section. The Wash Plant shall comply with the configurations of Rolling Stock and Track profile.
- b) The Contractor shall design the facilities to match the Wash plant Equipment room and underground water tanks as being constructed by the Depot Civil Contractor as per the drawing given in Section XI.
- c) The Contractor shall develop and submit BIM model of the Facilities in Revit/ Navis Works as per the requirements given in Clause 2.8.1, Section VI-A Part 2.
- d) Comprehensive Maintenance Service during DLP and for five (05) years Post-DLP as per the requirements given in Clause No 4.
- e) Electrical cables for connecting Power point to Control cabinet and from there to machine shall be supplied by the Contractor as per the requirement.
- f) Preparation and supply of drawings, documents, samples, specimens and operation & maintenance manuals as specified.
- g) Supply of resources, materials, tools, plant and manpower for delivery, installation, testing and commissioning of the Equipment to meet the intended functions.
- h) Interface Management with Civil Contractor, Rolling Stock Contractor, Track Contractor, Depot E&M Contractor, and any other relevant Contractors, as per Interface documents.
- i) Training of the Employer's/ Operator's staff shall be arranged as described in this specification.

3.2 Specific requirement of Automatic Train Wash Plant:

The Automatic Train Wash Plant design shall meet the following requirements and satisfy overall performance standard.

3.2.1 Operating Voltage:

The equipment shall be powered from the depot's supply voltage 415 V, AC, 3 Phase, 50 Hz. The Equipment is to be protected from surge, low/ high voltage through suitable devices. It shall function satisfactorily under permissible voltage and frequency variations under power supply regulations.



3.2.2 Equipment Installation:

- a) All gauges, adjustment points, switches, etc. shall be easily accessible and clearly identified with permanent identification markings. The device identification system shall be submitted for Notice of No Objection from the by Project Manager.
- b) All relays and contactors shall be installed within enclosures, in the manufacturer's recommended orientation.
- c) All pipes shall be clearly identified and properly marked.
- d) All pumps, pipes, tanks, spray poles, nozzles, enclosures, side covers to prevent water splashes from wash stations etc. required to be constructed of Stainless-Steel material shall be made of SS 316.

3.2.3 Device Reference Designators:

All electrical devices shall be identified with their alphanumeric designation corresponding to that used on the schematic.

3.2.4 Grounding:

- a) Safety grounding points shall be provided on all electrical equipment, unless otherwise agreed to by Project Manager. Grounding points shall be of tinned copper, clean, free from paint, and of a sufficient area to ensure proper electrical contact for the grounding cable fasteners. Untinned bronze grounding points and austenitic grade Stainless Steel grounding points or other international standard practices with approval of Project Manager are also considered acceptable. The area of any weld joining the grounding pad to a surface shall be at least equal to the cross-sectional area of the grounding cable.
- b) Grounding points will have either a tapped hole or, preferably, a clearance hole (with access to both sides) suitably sized for the lug attachment fasteners.
- c) Suitable grounding cable shall be provided, unless otherwise approved by Project Manager, and the size will be equal to, or larger than, that of the largest power wire connected to that equipment. All grounding wires and cables shall utilize longitudinally striped green and yellow insulation, or heat shrinkable tubing applied over the conductor insulation.
- d) Earthing Pits shall be provided by the Interfacing Contractor (E&M).

3.2.5 Wire Identification:

All equipment wires shall be marked with a unique wire identification number by means of marker sleeves located within 50 mm of each end of wire. In addition, the wire insulation shall be indelibly marked with the wire identification number. The Contractor shall be required to demonstrate the permanence of the inking system. The identification numbering system will correspond to the wire identification numbering system used on the schematic drawings and wiring diagrams.

3.2.6 Transient Suppression:

All relay coils, contactor coils, solenoid valve coils and other inductive devices shall be furnished with coil suppression and contact suppression shall be provided where necessary or specified.

3.2.7 General Circuit Protection Requirements:

- a) All input power circuits shall be individually protected by circuit breakers, and no circuit breaker shall protect more than one circuit, unless specifically approved by Project Manager. Circuit breakers terminals shall not be used as junction points. All circuit



breakers shall be sized by current rating and tripping time to protect both the associated equipment and the minimum wire size used for power distribution within the protected circuit over the expected ambient temperature range.

- b) Fuses shall only be used where specifically required by this Specification or where the use of circuit breakers is not technically feasible.
- c) Under no circumstances shall either the main or auxiliary contacts of contactors or relays be wired in parallel for the purpose of carrying a load at or above the manufacturer's trip rating.
- d) Under no circumstances shall poles of switches be wired in parallel for the purpose of carrying a load at or above the manufacture's contact pole rating.

3.3 Operating Principle of Automatic Train Wash Plant:

- 3.3.1** The Train Wash Plant shall be designed to carry out automatic washing of the side walls (up to the bottom edge) as well as front and rear of the Metro Train cars. The Kinematic Envelope (KE) of the Rolling Stock is attached herewith in Section XI, Part 4. The Contractor before commencing detailed design shall confirm if there is any change in Kinematic Envelope (KE) of train. The Contractor shall interface with Rolling Stock Contractor to get further details.
- 3.3.2** No fixed structure of the Plant shall be installed which causes infringement to the rolling stock in motion. The Contractor shall interface with Rolling Stock, Track and Depot Civil Contractor while designing the installation of Equipment and ensure that it is not in conflict with the SOD of the Project.
- 3.3.3** The Plant shall be of drive-through type and operated in a single direction from one side to other. The direction of travel in washing cycle is given in Drawing No 3, Section XI, Part 4. The Plant shall be designed to satisfactorily wash & clean the train with Train Operator/ driverless train running through the Plant under its own power at a speed of approx. 3-5 km/h. The power to the train will be supplied via an overhead 25 kV AC line covering the full length of the washing siding. In case of driver less train, the Contractor of Wash Plant need to interface with Signalling Contractor for all issues related to movement of train through the washing bay apron. The Wash Plant Contractor shall provide potential free contacts to Signalling Contractor for smooth operation of train movement during the entry/ exit to washing bay apron in addition to any other interface requirement of Signalling Contractor.
- 3.3.4** It is the Sole responsibility of the Wash Plant Contractor to ensure that the chloride content in the spray water of pre wet station, detergent station, water brush station, first rinsing station & final rinsing station shall not exceed 100ppm, 50ppm, 50ppm, 50ppm & 25PPM respectively. The above values are indicative and shall be finalised during design stage.
- 3.3.5** The Used Water in Wash plant has to be recycled for Re-use in Wash Plant to the maximum possible extent in order to economise in the overall water consumption without sacrificing the quality of water for washing of train.
- 3.3.6** Type of Water to be sprayed in various washing stations will be finalised by Project Manager during detail design stage of Wash Plant.



- 3.3.7 Any modification required to be done for satisfactory cleaning/rinsing/water streak removal shall be mutually decided and carried out by the Contractor free of cost to the satisfaction of MMRC. Therefore, Contractor shall carefully consider local ambient conditions like pollution, dust & quality of water in their design stage.
- 3.3.8 The Wash Plant shall be designed for automatic, semi-automatic and manual mode.
- Automatic mode:** In this mode, the wash cycle shall get completed from start to finish without operator intervention. The Wash Plant shall be activated and stopped by train movement through limit switches, ultrasonic devices, photo sensors or other approved means to enable complete washing of full 8-car train.
 - Semi-automatic mode:** In this mode, the plant room gets activated for replenishment of various tanks with operation of the appropriate equipment without the operation of wash stations at the washing Apron.
 - Manual mode:** Manual operation of the Wash Plant shall be allowed at the local control console, which shall be located at the wash area. In this mode, the various sequences shall be regulated by individual controls.
- 3.3.9 The position of various stations sensed by sensors, like limit switches, magnetic switches, photo sensors and proximity switches or other proven approved means shall enable complete wash cycle of the full length of train. The limit switch/ proximity switch/ sensors etc. which are required to be provided in the tracks, for sensing of the movement of trains requires proper interface with Track, Signalling & Rolling Stock Contractor.
- 3.3.10 The entire Plant shall be stopped automatically if the set parameters of washing cycle like train speed, brush RPM and flow of water are not matching.
- 3.3.11 The following facilities/ operation by the control console are required at the Depot Control Centre.
- Auto enabling of Wash Plant with Full Wash/ only Side Wash so that the Plant is being activated by the presence of train for ensuring complete wash.
 - Selective disabling of Plant so that the train can pass through the plant in either direction at a maximum speed of 25 km/h without the washing process-taking place.
 - Monitoring of details i.e. status/ health, operating hours of the plant shall be monitored at control panel with fault record storage facility for at least 30 faults on the basis on along with audio, VDU and Printer facility to be supplied by the Contractor.
 - Complete graphical indication of completion of washing cycle shall be available at control console of Wash Plant and at Depot Control Centre.
 - No staff shall be required to man the Plant in Automatic mode, other than to clean and replenish stocks of cleaning media.
- 3.3.12 Provision shall be made to switch over to "manual" mode of operation. The design shall provide for by-passing any one or more stages of washing, if warranted.
- 3.3.13 During operation of the machine, if it becomes inevitable to isolate a particular sub-system, the same should be possible thorough simple operation
- 3.3.14 Plant brushes shall be able to follow the contour of the body sidewalls, front, and rear of the train.



3.3.15 The Plant and its accessories shall have necessary provisions for interlocking of entry and exit controls with the spray nozzles manifold so that the Plant may not operate in the event of failure of the entry and exit controls.

3.3.16 The brushes shall automatically retract to their position in the event of any malfunction or activation of emergency stop buttons.

3.3.17 The pumps shall automatically shut down in the event of lack of water or detergent solution.

3.4 Plant Capacity:

3.4.1 The Wash Plant shall be capable to wash the lateral sides of the coaches including the curved portions, front and rear.

3.4.2 The Wash Plant shall be designed for washing of 6 trains of 8-car per hour with total capacity per day being of 30 trains of 8-car. The Contractor shall design the entire process and submit the same, supported by calculations, for Project Manager's Notice of No Objection

3.5 Plant Assemblies:

3.5.1 Assemblies by Wash Plant Contractor:

The Wash Plant shall comprise the following minimum sub-stations and accessories, which shall be provided by the Contractor.

- a) Control Console at Depot Control Centre (located approx. 1 km away) with cabling in suitable cable ducts.
- b) Local Control Console with cabling in suitable cable ducts at Wash Plant Control Room.
- c) Validation position
- d) Pre-wet Station
- e) Detergent Brush Station
- f) Water Brush Station
- g) Final Rinse Station
- h) Water Softener Plant
- i) Water Recycle Module, Water Tank, used Water Collecting Tanks. Associated pumps, valves, meters, etc. shall be provided inside the Wash Plant Control Room.
- j) Detergent Dosing Module with reverse osmosis plant and other associated equipment for the convenience of operation and maintenance of Wash Plant.
- k) Storage for 15 days' detergent requirement, specific tools and plants and any other items is required for day to day operation and maintenance of Wash Plant.
- l) Water Streak Removal Module
- m) Accessories such as sensing device/ switches, control gears and signage.

3.5.2 Provisions by Other Contractors:

The Wash Plant shall also include the following provisions, which will be provided by other Interfacing Contractors to the Wash Plant Contractor for integration into the Wash Plant.

- a) Underground Water Tanks close to Wash Plant area
- b) Used water collecting tanks
- c) Track work
- d) Wash Plant apron on track bed of approx. 70 m. x 10 m. area.
- e) Overhead line (Traction)



- f) Drain points for effluents discharged to the Effluent Treatment Plant of the Depot.
- g) Wash Plant Control Room

3.6 Plant Layout:

3.6.1 All the cables and pipes linking the Wash Plant apron area and Wash Plant Control Room shall run parallel to the track in a trench and cross the track in corrosion resistant sleeve pipes, perpendicularly under the tracks. Such a crossing shall be at either ends of the wash bed area.

3.7 Reference Data of Metro Cars:

The configuration of the Plant shall be designed to fit the characteristics of the Metro cars. The car body is made of Stainless Steel. The Contractor shall interface with the Rolling Stock Contractor for train dimensions and specification of the car body material to select the appropriate detergents and other cleaning agents.

3.8 Washing Process Station:

3.8.1 The Contractor shall submit detailed process flow of the complete system and additional measures taken for improving design to suit specified ambient conditions.

3.8.2 The washing process of the Wash Plant shall be optimized, for maximum cleanliness of the cars, with the parameters of the detergent composition, brushing momentum, spraying pressure and flow rate of each single process and water consumption. The design and process of Wash Plant shall aim to minimize the water requirements in washing of a train.

3.8.3 The Contractor shall carry out all necessary work, complete with tanks (except civil work as specified), pumps, pipes, valves, filters, meters and accessories as required in each station.

3.8.4 The Contractor has to provide a water consumption meter of reputed make at inlet line for Wash Plant.

3.8.5 Validation Box:

The validation position is provided at suitable location by the side of track before the washing station for ease in operation. The validation box having approx. size of 430 x 330 x 250 mm (indicative) shall be provided with the following facility:

Warning light:	Wash Plant ready
Warning light:	Washing forbidden
Push button:	Washing request selection
Push button:	Washing request cancel

3.8.6 Pre-wet Station:

- a) Adequate number of spray poles and nozzles shall be provided for pre-wetting of the side surfaces. The Pre-wetting shall be performed by the spray nozzles to break down surface tension for even adherent of further washing medium.
- b) The pre-wetting process shall adopt recycled water, which shall be supplied from the water recycle module.

3.8.7 Detergent Station:

- a) Detergent station shall consist of a set of two vertical brushes (one in each side) with Stainless Steel spray poles, suited to cleaning the lateral surfaces of the train. Each brush



shall include an arrangement to spray water and detergent solution evenly on the car surface.

- b) The Contractor shall preferably use Indian detergents, otherwise Contractor shall propose equivalent Indian detergents within one (01) month of commissioning of the Plant.
- c) The detergent solution shall not exceed a pH value of 9, so as to eliminate risks of detrimental chemical reactions on the car body but it will be decided after interface with Rolling Stock Contractor.
- d) The detergent process shall adopt soft water.

3.8.8 Water Brush station:

- a) Two pairs of vertical brushes, two on each side, shall be provided for water brushing on the car body surfaces. Each brush shall be integrated with a spray pole with simultaneous operation. The water brushing process shall be divided into two stages. The first stage shall adopt recycled water while the second stage shall use soft water. These brushes shall have motors driving the brushes. The Brush Rotor shall be controlled pneumatically/ electrically to ensure that the brush follows the contour of the train profile.
- b) The two stages of water brush station shall be separated with appropriate distance such that the water sprayed at each stage can be individually collected by separate drain.

3.8.9 Final Rinse Station:

- a) Final rinsing shall be in two stages, first stage rinsing with fresh water & second stage rinsing with RO water. For first stage rinsing, minimum one set of spray pole and for second stage rinsing, minimum two sets of spray poles to be provided.
- b) Filtration of water shall be done with Reverse Osmosis system for the final rinse of the train. Stainless Steel tanks of suitable capacity shall be used for water storage. RO Plant shall be capable of generating not less than 1000 litre/hr (indicative). Treated Water from RO Plant shall be collected in separate suitable tank of capacity of approx. 5000 Ltr. The above-mentioned capacities are indicative and shall be finalized during design stage.
- c) The final rinsing process shall be designed with the consideration of water streak removal. A portion or all of the water for final rinsing shall be supplied from the water generated from the RO Plant. Total dissolve solids of RO water shall be generally less than 50ppm PPM. This data is tentative and shall be finalised during Design Stage.

3.8.10 Front & Rear Wash Station:

- a) The Contractor shall design for front and rear washing of Metro trains.
- b) The design for Front & Rear Wash shall be developed for avoiding damage to wipers.
- c) The design shall also include safety provisions for working under live OHE.
- d) It shall be possible to isolate Front & Rear wash in the wash cycle.
- e) The Pressure of Brushes shall be adjusted to avoid any damage to front & rear wiper during wash process or any suitable option may be proposed to protect the damage of wiper.

3.8.11 Detergent Dosing Module:

- a) The detergent-dosing module shall be equipped to facilitate dosing of the detergent in the designed proportion controlled through PLC. For any adjustment of detergent quantity, metering shall be available through MMI.



- b) The module shall be complete with tanks of approx. 1000 litres capacity, pumps, pipes, valves, meters and accessories. The capacity of tank shall be finalised during design stage. Stainless Steel tanks with sufficiently thick gauge walls shall be used for detergent storage.

3.8.12 Water Streak Removal Module:

- a) The water streak removal technique to be adopted shall effectively eliminate the possibility of water streaks after final rinsing. This can be achieved by introducing the 2 sets flap type fixed brushes after final rinsing station, which follows the contour of train body to eliminate the possibility of water streaks after final rinsing.
- b) Any alternative design which suits the requirement may be explained in the Technical Proposal attached with the Bid.
- c) Contractor shall install three (03) blowers on each side of track at the exit side of wash bed of capacity approx. 5 KW each to remove the water droplets from the sides and Underframe of the train after washing to avoid water spots. The operation of the blower shall start automatically after sensing the approach of train.

3.8.13 Water Recycle Module:

- a) The water recycle module shall be provided to minimize the water consumption in the Wash Plant. The recycled water shall not contain sediments, free oil, grease, residue detergent and odour etc. The aim is to recycle part of treated water and discharge the excess.
- b) The module shall remove all sludge, suspended particles, oils, hydrocarbon and residue detergents. The procedure of sludge removal shall be simple and should be mechanized
- c) It shall also provide the water softening plant to reduce the hardness of the water of partially treated water. The Level of hardness of the water from Softener Plant shall be general less than 5mg/litre (tentative). The discharge from softener plant shall be diverted to ETP unless decided otherwise during design stage.
- d) Used water from the first rinse station, final rinse station and second stage water brush station shall be collected after proper screening in underground reinforced concrete recycling tanks. The recycled water shall then be reused in the pre-wet station and first stage water brush station.
- e) All water from the stations of pre-wetting, detergent spraying and first-stage water brushing shall be collected in a sump to discharge to the effluent treatment plant.
- f) The module shall filter the used water to a standard that eliminates the possibility of spray nozzle clogging at the respective stations.

3.8.14 Water Recycling Treatment Procedure:

The treatment shall include the following.

- Filtration through Quartzite or similar
- Adsorption through activated carbon
- Oxidization by air injection

The excess water can be discharged into the drainage system connected to the effluent treatment plant (ETP).

Alternative solutions with latest and proven technology can be used with Notice of No Objection from the Project Manager.



3.8.15 Traffic lights:

The Contractor shall design and provide suitable number of traffic lights at appropriate locations at the wash bed for controlling the movement of trains as per the need. These lights shall be activated and operated through sensors to be provided by the Contractor.

3.9 Control Console

3.9.1 The control console at the Depot Control Centre (DCC) shall be provided for normal automatic operation of the Wash Plant and the local control console at the wash area for manual operation of Wash Plant and also for operation during maintenance work.

3.9.2 The control of the Wash Plant shall be fitted with PC to safeguard and sequence all automatic processes and movements. The changes required in sequencing or timing of various operations shall be implementable through control panel HMI touch screen. Control of related and conflicting operation functions shall be interlocked to enable logical operation of wash cycle. The screen shall be selectable from menu and shall also provide diagnostic/faults messages. The control shall have the provision to revert back to a pre-determined setting of the plant, should there be any wrong setting by an operator.

3.9.3 The Contractor shall furnish complete details of flow chart sequencing ladder diagram etc. developed for plant operation.

3.9.4 The consoles shall be provided with HMI touch screen display/ pushbutton switches for various operations as well as indicating lamps and meters for monitoring the operations in progress.

3.9.5 The consoles shall allow spare spaces for apparatus installation, such as intercom and telephone, etc. in the future.

3.9.6 DCC Control Console:

The DCC Control Console shall be provided with Control Panel (HMI) monitor and operates the Wash Plant. The operation is fully automatic, but panel shall also allow semi-automatic mode of operations. The panel provides for console selection for operation of plant from the Local Console. The Contractor may provide alternative better system of controls with Notice of No Objection from the Project Manager. The Control Console shall provide the following minimum control and monitoring functions:

A	Main isolator	Key Switch for ON/ OFF
B	Console selection	DCC CONSOLE/ LOCAL CONSOLE
C	Wash Plant mode	WASH/ NO WASH
D	Wash Mode Type	Full Wash/ ONLY SIDE WASH
E	Detergent spray station	On/ Off
F	Emergency stop button	Push to Stop/ Turn to release
G	Washing in process	Flashing amber light
H	Train passing by	Green light
I	Common major fault signal	Flashing red light and Emergency stop
J	Common minor fault signal	Flashing yellow light for repair



K	Lamp test button	Push button
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3.9.7 Local Control Console:

A single Control Panel (HMI) monitors and operates the Wash Plant. The operation is fully automatic, but panel shall also allow Semi-Automatic and Manual Mode of operations so that plant can be controlled from plant room. The Contractor may provide alternative better system of controls with Notice of No Objection from the Project Manager. The local Control Console shall be provided with the following minimum control functions and monitoring functions.

A	Console Power	ON/ OFF
B	Plant Power	Key Switch ON/ OFF
C	Plant Operation	AUTO/ MANUAL
D	Wash Plant Mode	WASH / NO WASH
E	Wash Mode Type	FULL WASH/ ONLY SIDE WASH
F	Detergent level	LOW
G	Individual washing process	ON/ OFF
H	Emergency stop button	Push to STOP/ TURN to release
I	Status of individual process	Flashing amber light
J	Fault signal for sub-assemblies	Flashing red light
K	Pressure gauge for each pump line	Meter
L	Lamp test button	Push Button
M	Supply failure (water, pneumatic system, electricity)	Flashing red light

3.10 Signage:

3.10.1 Signage shall be provided along the track of the Wash Plant to indicate the operation status of the Plant. The letters of the signage legends shall be of adequate size to be read at a distance of 20 m.

3.10.2 All illuminated board with legends shall be erected at the entrance to the washing plant from mainline.

3.10.3 A single illuminated signage with legends shall be erected at the entrance end of the Wash Plant. The legends shall indicate following messages depending on operational status of the Plant:

“WASHING MODE START”

“WASH DISABLED: DEPOT SPEED” if the Plant is switched off,

“DO NOT ENTER” if the Plant is engaged for a train coming from exit end direction, or



“TRAIN WASH: SPEED 3 to 5 KM/HOUR.” at all other times.

3.10.4 Similarly, a single illuminated signage with legends shall be erected at the exit end of the Wash Plant. The legends shall indicate the following messages depending on operational status of the plant;

“DO NOT ENTER” if the Plant is engaged for entry end trains, or

“DEPOT SPEED” at all other times.

3.11 Connection to Fresh Water Tank:

3.11.1 The water tank will be constructed by a Depot Civil Contractor and will be in the form of an underground concrete pit with a capacity of approx. 30 m3.

3.11.2 Pumps and pipes shall be provided by the Wash Plant Contractor to pump the fresh water from the water tank for train washing process.

3.12 Wash Apron:

3.12.1 The wash apron shall be designed by Wash Plant Contractor with appropriate partitions, grating and drain valves for drainage of wastewater, the drainage of storm water and collection of recycled water. The wash pit/ apron shall be designed with reinforced concrete structure for the support of the railway track running through the facility.

3.12.2 On approval of wash apron design, wash apron will be constructed by Interfacing Civil Depot Contractor.

3.13 Connection to Effluent Treatment Plant:

3.13.1 The effluents to be discharged from the Wash Plant will get drained to the Common Effluent Treatment Plant (ETP) of the Depot. The ETP, which is not part of this Contract, will be constructed by the Interfacing Civil Depot Contractor. Wash Plant Contractor will make connection to ETP pipeline located close to the Wash Plant area.

3.13.2 All water from the stations of pre-wetting, detergent spraying and first-stage water brushing shall be discharged into a sump and connected to pipeline going to ETP.

3.14 Remote Surveillance System:

3.14.1 Remote downloading of the diagnostic and status/ health of machine, through wi-fi and RS-485 or latest communication links access as agreed by the Project Manager, shall be provided within the depot premises. Necessary arrangement for this purpose shall be provided by the Employer (wifi link, server etc.) so that commercially available laptop/ mobile can be connected for the same.

3.14.2 The surveillance system shall pickup all Wash Plant information to record and display all data depicting plant operation in real time. Remote surveillance system shall only record and display Wash Plant status whereas the operation of the Wash Plant shall be controlled only through Control Console at Depot Control Centre or Wash Plant Control Room.

3.14.3 The remote surveillance system shall have following characteristics/ features:

a) A PC with software along with a graphic interface shall be provided. All layout and control functions required for record and display of Wash Plant data shall be provided as detailed below.

b) Facilities to be provided for information related to Wash Plant functioning and recording of following data:



- Wash Plant choice (WASH/ NO WASH),
 - Wash Type (FULL WASH/ SIDE WASH)
 - Rotating brush functioning- rpm, pressure,
 - Number of washing cycle completed during desired period,
 - Number of washing cycle completed in terms of trains,
 - Washing timing and consumption display (water, softened water, detergent, etc.),
 - Alarms, and
 - Preventive Maintenance notifications.
- c) It shall have the facility of extracting required data for analysing in excel worksheet.
- d) It shall have the facility of automatic production of statistics for daily, weekly, monthly and yearly operation of Wash Plant.

3.15 Spray Nozzles:

3.15.1 The spray nozzles shall be arranged to wet the surfaces to be washed with optimum efficiency and flow rate of water. The numbers of spray nozzle shall preferably be not less than 10 (ten) per set of brushes for side wall, front and rear washing as well as pre-wetting station.

3.15.2 The spray nozzles shall be made of Stainless Steel and enclosed within structural steelwork to minimise the possibility of damage. The spray nozzles shall emit wide-angle conical spray pattern, perpendicular to the area of sidewalls of the coaches being washed. The spray nozzles shall be set close enough to permit the overlapped spray cones for complete coverage of the surfaces to be washed. However, these nozzles shall be installed in such a manner that these remain clear of the structure gauge. These nozzles shall be from reputed manufacturers and shall give optimum performance without clogging and frequent requirement of cleaning.

3.15.3 The Pipes which will be used for spray station shall not be less than 40mm.

3.16 Brushes:

3.16.1 The brushes shall be mounted on crank arms, which shall protrude the brushes from home positions during brushing as well as retract them after brushing. The device mechanism shall be described in the offer. The protrusion shall prevent, by adjustable limit switches, any sturdy parts from encroaching the vehicle gauge under all conditions. The brushes shall reach the rotational speed prior to making contacts with the first car. In the event of brush mechanism failure, the brushes shall be retracted from the operative positions. The characteristics of brushes (diameter, rotating speed, type of drive motor etc.) shall be provided by the Contractor.

3.16.2 Brushes shall be operated with electric actuators for applying a constant pressure on the surface of the train. The recording of the pressures will be stored in the monitoring system and will enable the wash of different types of trains to prepare for future needs. A pneumatic system will allow for automatic return to idle position in case of failure or emergency.

3.16.3 The working life of brushes shall be washing of at least 1500 working hours or two years whichever is earlier. The Contractor shall describe the bristle's material. The materials may be made of LDPE +LLDPE +1% anti UV in interface with Rolling Stock Contractor and



soft enough so that it does not make mark on the surface of the car. The Contractor may use alternative materials in interface with Rolling Stock Contractor.

- 3.16.4 The bristles shall be capable of ensuring proper friction against the sides of the cars while remaining flexible and strong enough so as not to be torn out or cause damage to the Rolling Stock during passage of various exterior fittings which may slightly protrude beyond the lateral gauge of the cars.
- 3.16.5 The fixing of brushes to the member shall be strong enough to withstand shearing forces generated during its operation; the arrangement of fixing shall be explained in the offer.
- 3.16.6 Minimum 6 (six) vertical brushes (3 pairs) shall be provided for cleaning of side walls and 2 (two) horizontal brushes for cleaning of front and rear. The speed of brush cylinder shall suit the requirements of desirable level of washing.

3.17 Pumps:

- 3.17.1 All the pumping system for the processes of detergent spraying and final rinsing shall be provided with 100% redundancy. Failure of any one pump shall not deteriorate the performance of the wash process.
- 3.17.2 The pumps shall be complete with alternate start-up control between on duty and on standby mode. In the event of one pump failure, another pump shall be set as duty pump. Indian equivalent of pump shall be advised. The pumps shall be metering adjustable pumps.
- 3.17.3 Contractor shall provide Stainless Steel pumps and flexible Stainless Steel-braided hose connections with flanged connection and shutoff valves at both the inlet and outlet of all pumps (except submersible pumps).
- 3.17.4 Weatherproof pressure gauge in the discharge side of each pump with a ¼ inch NPT Stainless Steel valve upstream of the gauge shall be installed.
- 3.17.5 Pumps indicative capacity of each section is mentioned below. The Contractor shall mention proposed capacity in their Bid. Capacity may increase or decrease during detailed design as per actual site conditions and shall be approved based on submission of design calculation at the design stage:

A	Pre-wetting pump	4.5 kW
B	Detergent dosing pump	1.5 kW
C	Water brushing – first stage pump	5.5 kW
D	Water brushing- second stage pump	5.5 kW
E	First rinsing pump	7.5 kW
F	Final rinsing pump	2 kW

3.18 Piping and Steel Work:

- 3.18.1 All pressurised pipes including the delivery from the detergent dosing module, the water streak removal module and various connection for proper functioning of Wash Plant shall be of Stainless Steel. Other pipes such as drainage and connecting pipe to civil drainage/ETP chamber shall be of UPVC/ HDPE/ GI Pipes.



- 3.18.2 Stainless Steel enclosures and fasteners shall only be used to minimize corrosion of mechanical fixtures.
- 3.18.3 The piping and control elements shall be arranged in such a manner to ensure ease of removal and replacement operations of one or more elements such as solenoid valves, pumps, etc.
- 3.18.4 Piping shall be securely fixed to prevent transmission of vibrations to the entire installation.
- 3.18.5 Water pipes shall be properly positioned to avoid low points all along the length of the pipes. Drain points shall be provided at all low points of the pipes for periodic drainage.
- 3.18.6 Plant shall be designed to avoid any scale formation after prolonged idling.
- 3.19 Electrical /Electronic Equipment:**
- 3.19.1 All control and regulation electronic and electrical devices, etc. shall be mounted in dust proof switchboards with protected enclosures and the switch board frames shall be covered with galvanised steel enclosure. All electrical wiring shall be marked carefully in compliance with the electrical diagrams and be protected against ingress of water.
- 3.19.2 The temperature inside the closed cubicles installed in open area may rise close to 50 degree centigrade during summers. Contractor shall submit proposal containing the compatibility of the electronics component etc. to withstand the temperature.
- 3.19.3 The control circuit shall be supplied with low voltage protection.
- 3.19.4 Protection and safety devices shall be provided such as fuses, circuit breakers, micro-processor-based relays, single-phase protection to safeguard against surges, overloads, earth leakage, etc.
- 3.19.5 The main isolating switch shall be able to be padlocked. The control panel door shall be mechanically interlocked with isolating switch.
- 3.19.6 All electrical apparatus and metal surfaces of the plant shall be connected to the earthing circuit using a 25 mm² bare copper cables inside the suitable GI pipe which shall be provided for connection to the electric current earth return system via an earth isolating switch. The earthing circuit shall be looped.
- 3.19.7 Pushbuttons and indicating lights on the consoles shall be grouped by functions and identified clearly with legends.
- 3.19.8 All controls elements shall be wired in generously sized terminal blocks and panels well ventilated, carefully marked and easily accessible. All electrical equipment shall be suitably earthed as per relevant standard.
- 3.19.9 All glands to the panel shall be suitable for the type and location of cable.
- 3.20 Maintenance Provision:**
- 3.20.1 The brushes shall be made in sections, each capable of being changed individually when its life expires, or it becomes unusable for any other reason. The rotating member of the brush shall be fully secured with respect to safety of the trains and arrangement shall be explained in the offer.
- 3.20.2 Spray jets, brushes, brush drive gear and other equipment shall be accessible by fixed lockable safety ladders and walkways that shall be provided to ensure routine inspection



and maintenance. The interval of such maintenance should be seven days or more. No electrical overhead equipment or wiring should be accessible from these ladders and walkways.

3.20.3 Suitable number (Minimum six) of weatherproof LED floodlights of at least 100 W each and IP 66 based along with rigid support poles, etc. of reputed make shall be provided to enable adequate illumination for maintenance work when required to be carried out during night and for inspection of wash process.

3.20.4 All equipment in the Plant Room that requires frequent maintenance shall be so arranged that the equipment is readily accessible for maintenance. The Wash Plant equipment and piping layout shall not cause hindrance to the free movement of the maintainer/ operator.

3.21 Checks and Tests

3.21.1 In Manufacturer's Plant

- a) Contractor shall submit Test Protocol for approval to conduct FAT at the OEM's premises.
- b) Checking of the assemblies and sub-components prior to assembly shall be done at OEM's plant. The Contractor shall carry out all checks of supplies prior to delivery of these supplies to his workshops.
- c) Before despatch of Wash Plant to the site, checks and tests shall be carried out on the Equipment and its sub-assemblies by the Employer's representative in the manufacturing works to ensure that the supply is in accordance with the technical specification and with the approved design documents.
- d) Operation of safety and protection devices shall also be checked.
- e) The Check and tests shall also comprise:
 - Check of insulation (in case of electrical plant)
 - Check of assembly work (welds, hardware etc.)
- f) The entire supply shall be inspected by the Project Manager at the Contractor's premises before shipment to the site.
- g) The supplier shall provide all documents pertaining to FAT to the Engineer for verification.

3.21.2 Checks at Site

- a) This check will be done to acknowledge that the Equipment is capable of performing regular service under normal operating conditions.
- b) The installation shall be subjected to a series of practical tests and trials, during which the Contractor according to the profile of the cars will adjust the spray nozzles.
- c) The Contractor shall supply sufficient quantity of detergent/ cleaning agent for tests at site.
- d) Guarantee tests shall be carried out during the trial runs of the Wash Plant with the Metro trains in order to verify the satisfactory operation of the Plant.
- e) The Contractor shall demonstrate the Wash Plant performance after successful Installation and Testing at the depot. The Employer's Representative shall watch the Wash Plant performance for a period of up to one month or 100 numbers of trains washed (excluding the trains washed during testing & commissioning); whichever is later before issuance of the Operational Acceptance Certificate.
- f) Operation of safety and protection devices shall also be checked.



3.22 Delivery:

- 3.22.1** All documents, inspection test procedure and other deliverables shall be supplied to the Project Manager along with the despatch of the Wash Plant.
- 3.22.2** Any parts of the Equipment that is damaged shall not be considered as delivered unless repairs or replacements have been made.
- 3.22.3** Contractor's personnel or local associate shall take care of, keep a watch on and guard the equipment/ materials on arrival at the depot till the time the Equipment gets installed and commissioned by the Contractor at site in all respect.

3.23 Protection and Safety:

- 3.23.1** Over-speed sensing device, which can be adjusted for settings, shall be provided to protect the cars and the Wash Plant against damage from over-speeding train. This mechanism will retract the brushes, in case train speed, during wash process, exceeds pre-set limits.
- 3.23.2** In the event of lack of water, the pumps of the corresponding stations shall get shut down automatically and the corresponding brushes shall be retracted.
- 3.23.3** In the event when train stops within the Wash Plant during an automatic operation, the Wash Plant operation shall stop after a pre-set time delay.
- 3.23.4** In the event of a failure of the activation system, or malfunctioning of motors and brushes, the retraction devices fitted on all brush stations shall automatically return the brush swing arms into their cowls, clear of the car body sides.
- 3.23.5** In order to limit water splashes, so as to reduce water spillage and wastage, Splash guard/Anti Splash System made of Stainless Steel with minimum thickness 3mm shall be provided at each Brush Station covering full height.
- 3.23.6** An alarm indication shall be provided in case of water flooding in underground sump to control wastage of water by spilling.
- 3.23.7** The Plant shall be protected against deterioration of the structure and base due to contact by chemicals used for cleaning and operational conditions.
- 3.23.8** Suitable well-ventilated enclosure shall be provided to safeguard the outdoor equipment from the ambient conditions
- 3.23.9** All fixed elements of the Plant, all screws, nuts, bolts, clamps, etc. shall be of Stainless Steel or high standard corrosive resistant materials.
- 3.23.10** Emergency stop push buttons shall be provided to halt the operation of the brushes, with suitable warning signs in English, Hindi and Marathi, at a suitable height to allow easy access. The emergency push buttons shall be located at each side of the track in corrosion-proof stainless-steel enclosures, at each end of the wash, at rinse facilities and in the Wash Plant Control Room.

----- End of Clause No 3 -----



4 Comprehensive Maintenance Service during DLP and Post-DLP:

4.1 General Maintenance Requirements

The Contractor shall carry out the Comprehensive Maintenance Services (CMS) for the scheduled and unscheduled maintenance, which includes breakdown attention, any overhaul of the sub-system, repairs of sub-system and replacement of the specified defective parts of the Wash Plant during DLP and for a period of 5 years after completion of the DLP. It is mandatory for Contractor to quote for Comprehensive Maintenance Contract, without which their offer will be treated as incomplete and nonresponsive.

4.1.1 Equipment Maintenance:

- a) The Comprehensive Maintenance of the Equipment shall be carried out by the Contractor commencing from within fourteen (14) days of Operational Acceptance of the Equipment.
- b) The CMS during DLP shall last up to the completion of twenty-four (24) months from the date of Operational Acceptance of the Equipment. This period shall get extended by no of days, the Equipment remains defective and unable to perform its functions of train washing for the faults attributable to the Contractor during the above period. The downtime period in hours shall be converted to days and rounded off to the nearest number of days.
- c) The period of 5 years of post-DLP shall commence after completion of the period of DLP as in Clause b) above.
- d) The Contractor will be responsible for Comprehensive Maintenance Service of the Equipment including Electronic- Control & Drives, Pneumatic, Hydraulic, Electric, software and all other peripherals.
- e) The Contractor shall be responsible for all co-ordination with the sub-Contractors, if any, for repairs to the maintenance of the Equipment.
- f) The Contractor shall plan periodic visits, at least once every month, for servicing/ maintenance as required for proper upkeep and smooth functioning of the Equipment. Any intermediate visit required for attending to the unscheduled maintenance requirement shall be the obligation of the Contractor under the CMS contract.
- g) The Contractor shall be accountable for replacement of the items as specified in **Appendix 1** to this Section on his account for all faults/ failures/ routine maintenance during CMS:
- h) staff to carry out the fault diagnosis, minor attention and cleaning of the Wash Plant as required during the period Contractor's staff is not available. A certificate shall be issued to the Employer's staff verifying the competence of the staff in above works.
- i) The Contractor shall be in regular contact with the Depot officials and ensure smooth functioning of the Wash Plant and its associated accessories, etc. He shall also provide remote guidance in fault diagnosis and minor attention by the Employer's staff.
- j) Routine check sheets shall be prepared for the Employer's staff to carryout periodic checks.
- k) The Employer will provide the services of its staff for operating the Equipment during the visit of Contractor's Service Engineer, if so required.
- l) Electricity and water required for the maintenance of the Wash Plant will be provided free-of-cost by the Employer. Any material handling facility if available and required for transportation within the depot can also be provided free of cost by the Employer.



- m) The Contractor shall attend the Wash Plant within one (01) day for every monthly schedule and four (04) days during annual schedule. During these periods, the Contractor shall liaise with the Employer to ensure minimum effect on the washing of trains.
- n) The Contractor shall plan the Preventive maintenance of the Equipment during non-working periods of the Equipment and shall therefore plan it in consultation with the Project Manager/ Employer.

4.1.2 Breakdown Failure:

- a) When a failure is reported by Employer's representative, a qualified service engineer must visit the site within the Response time as in clause 2.11.1
- b) In case, preventive maintenance is carried out along with breakdown maintenance, preventive maintenance time will be deducted from the total down time of the machine.
- c) Figures of MTBF shall be calculated as in 2.11.2.

4.1.3 Damage to Equipment due to External Factors:

In case of damage to the machine on account of any external factor, viz., floods, earthquake, fire, arson or sabotage, entire cost of repairs including cost of spare parts and material necessary for repair of the plant shall be borne by the Employer.

4.1.4 Software Up gradation in the Machine:

Any software up gradation in the machine required to be done within 7 years from the date of commissioning of the machine shall be executed by the Contractor at no extra cost.

4.1.5 Maintenance Records:

Contractor's staff will have to maintain proper records of Comprehensive Maintenance Service of the Equipment as per the directions of Employer. Some of the records to be maintained are as follows:

- a) Details of Preventive Maintenance carried out, time taken and deployment of man power for these schedules.
- b) Details of each breakdown, time taken and deployment of man power for breakdown calls.
- c) Quarterly utilization of Spares.
- d) Quarterly summary of work carried out as per schedule of work.

All the above records shall become the property of the Employer. The Contractor will use all reasonable endeavours to ensure that the records are protected from loss, damage, theft or other detrimental effects.

This shall also be maintained in Employer's Common Asset Management Software (CAMS) as described in Clause 4.6, Section VA-A.

4.1.6 Maintenance Spares:

- a) The Contractor shall keep stock, duly accounted, of all spares including unit exchange sub-assemblies, consumables, and lubricants etc., as per the requirements and are necessary for proper functioning of the Equipment, at site for at least 6 month's level of consumption.
- b) Spares having low shelf life shall be kept for a period maximum up to the expected life of the Spare.



- c) The Contractor shall, based on the consumption figures of the items in every half-yearly period, increase the stock of spares to be stocked in the Depot in accordance with the above limits.
- d) For all such materials stocked at the Depot and left unconsumed after the completion/ termination of CMS, the Employer shall have the discretion to retain these materials at the cost agreed to between the Contractor and the Employer.
- e) If any spares or consumables owned by the Employer are available, the Contractor shall make use of the same in urgent conditions, if so called for by the Employer. The stock of such items utilised by the Contractor shall be replenished in new condition by the Contractor in every quarter along with quarterly replenishments of the consumed materials.
- f) Where the Contractor replaces parts or components of the Facilities, the replacement parts or components shall become the property of the Employer after replacement. The replaced parts or components shall remain the property of Employer.
- g) The Contractor shall provide the details of such part or component replaced to the Project Manager/Employer.
- h) The Project Manager/Employer may inspect any part or component replaced by the Contractor.
- i) If at any time in carrying out repairs, the Contractor permanently replaces any part or component of Equipment, it will do so with a replacement that is new or equivalent to new in performance when used as part of the Equipment.

4.2 Items of attention during CMS- Wash Plant

The Contractor shall make his own Maintenance plan covering attention to different systems, sub-systems and individual components of Wash Plant to ensure the best possible reliability of the machine. Routine cleaning and checking of various functions will be carried out by the Employer's machine operator under the guidance of the Contractor. This program of routine maintenance is generic in nature and will be tailored by the Contractor specific to certain features and equipment of the machine supplied. Further, the Contractor based on the R.A.M.S. data gathered for the machine from previous supplies, shall prepare the check sheets for different periodic, viz. monthly, quarterly and annual checks and maintenance etc. Following are the broad guidelines to prepare the check sheets.

4.2.1 Wash Equipment Safety Guarding

- a) Inspect guarding for loose fixings.
- b) Check switches operation correctly.
- c) Ensure that mechanical interlocks on doors/ guards are working correctly.

4.2.2 Drive Head

- a) Drain & Refill Gearboxes.
- b) Top Up Gearboxes with oil
- c) Clean off around up & down electrical switches
- d) Check Sensors & electrical cable for damage
- e) Check Drive Motor
- f) Replenish with Grease Top & Bottom Ram



4.2.3 Electrical

- a) Open doors and visually check for damage to plugs and cables.
- b) Check functionality of all emergency stop buttons.
- c) Check functionality of all pumps and motors.
- d) Check all lamps & replace bulbs as necessary
- e) Inspect fans in main cabinet for correct operation
- f) Check filters in fans in main cabinet.
- g) Check operation of air conditioning unit in the main cabinet.
- h) Inspect door seals and latches for integrity.
- i) Remove aircon filter and clean with compressed air.
- j) Check control desk for damage.

4.2.4 Painting

- a) Touch Up / Repair Paintwork damage.

4.2.5 Operation Checks

- a) Test of Wash Plant function and accuracy (customer supplies gauges).
- b) Check Wash Plant control system for detergent dosing, water flow and brush speed using calibration process – Record Results.

4.2.6 Lubrication Reservoir

- a) Top up with oil.
- b) Check lubrication points for correct functionality.

----- End of Clause No 4 -----



Appendix 1: List of Items under supply by Contractor for CMS

Sr No.	Items
1	Brushes, Pneumatic Cylinders, Nozzles and associated parts in the assembly.
2	All Types of Motors and Pumps with associated parts including Starters, cables etc.
3	All fasteners
4	All couplings and pins
5	Actuators
6	All Types Gears
7	All bearings
8	Conical stop
9	PLC output interface
10	All lamps and lights and associated fittings
11	All electronic cards, Hardware and Software
12	All types of Panels, Relays, Contactors, Sensors, Limit Switches, Photocells, Circuit Breakers etc.
13	Closure assembly
14	Inverter
15	All lubricants including oils and greases.
16	Water Pressure Switch
17	Quartzite Stand
18	Activated Carbon
19	Air Pneumatic Pipes and fitting & Pneumatic Cylinder Assembly
20	Local Isolator
21	Water Softener, any component of treatment & RO plant
22	Any other spares involving wear and tear having price not more than ₹5000 per item.



BIDDING DOCUMENTS



MUMBAI METRO LINE 3 (COLABA-BANDRA-SEEPZ)

CONTRACT MM3-CBS-DEQ-9-02

Design, Manufacture, Supply, Installation, Testing, Commissioning
and Comprehensive Maintenance Service of
Automatic Train Wash Plant
for Project "Mumbai Metro Line-3"

PART 3

CONDITIONS OF CONTRACT AND CONTRACT FORMS

- Section VII General Conditions of Contract (GCC)
- Section VIII Particular Conditions of Contract (PCC)
- Section IX Contract Forms
- Section X Special Conditions of Comprehensive Maintenance Service

January - 2020

**Mumbai Metro Rail Corporation Ltd
MMRC Line 3 Transit Office,
Wing 'A', 'E' Block,
Bandra-Kurla Complex,
Bandra (East), Mumbai 400 051, India**



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Bidding Documents Composition of Documents

PART 1	Bidding Procedure
Section I	Instructions to Bidders
Section II	Bid Data Sheet
Section III	Evaluation and Qualification Criteria
Section IV-A	Bidding Forms
Section IV-B	Pricing Document
Section V	Eligible Source Countries of Japanese ODA Loans
PART 2	Employer's Requirements
Section VI-A	Employer's Requirements – General Specifications
Section VI-B	Employer's Requirements – Technical Specifications
PART 3	Conditions of Contract and Contract Forms
Section VII	General Conditions of Contract (GCC)
Section VIII	Particular Conditions of contract (PCC)
Section IX	Contract Forms
Section X	Special Conditions of Comprehensive Maintenance Service
PART 4	Drawings
Section XI	Drawings



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BIDDING DOCUMENTS



MUMBAI METRO LINE 3 (COLABA-BANDRA-SEEPZ)

CONTRACT MM3-CBS-DEQ-9-02

Design, Manufacture, Supply, Installation, Testing, Commissioning
and Comprehensive Maintenance Service of
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for Project "Mumbai Metro Line-3"

Part 3 Conditions of Contract and Contract Forms

Section VII General Conditions of Contract (GCC)

January - 2020

**Mumbai Metro Rail Corporation Ltd
MMRC Line 3 Transit Office,
Wing A, Block E,
Bandra-Kurla Complex,
Bandra (East), Mumbai- 400 051, India.**



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Section IX	Contract Forms
Section X	Special Conditions for Comprehensive Maintenance Service
Part 4	Drawings
Section XI	List of Drawings



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GENERAL CONDITIONS OF CONTRACT (GCC)

The General Conditions governing this Contract are the Standard General Conditions of Contract set forth in Part 3, Section VII of the Standard Bidding Documents for Procurement of Plant Design, Supply and Installation (version 1.1) published by JICA in February, 2013. **Those General Conditions of Contract are available on the JICA's web site shown below:**

https://www.jica.go.jp/english/our_work/types_of_assistance/oda_loans/oda_op_info/guide/tender/c8h0vm0000aoesst-att/plant.pdf

“Instructions to Bidders included in Option A, Single-Stage Two-Envelope Bidding, Section VII,” is available at page numbers 275 to 363. Information on pages 355 to 363 is not relevant to this tender.

A copy of these General Conditions is not attached to these Bidding Documents/ this Contract.

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BIDDING DOCUMENTS



MUMBAI METRO LINE 3 (COLABA-BANDRA-SEEPZ)

CONTRACT MM3-CBS-DEQ-9-02

Design, Manufacture, Supply, Installation, Testing, Commissioning
and Comprehensive Maintenance Service of
Automatic Train Wash Plant
for Project "Mumbai Metro Line-3"

Part 3

Conditions of Contract and Contract Forms

Section VIII

Particular Conditions of Contract (PCC)

January - 2020

Mumbai Metro Rail Corporation Ltd

MMRC Line 3 Transit Office,

Wing A, Block E,

Bandra-Kurla Complex,

Bandra (East), Mumbai- 400 051, India.



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Section VIII. Particular Conditions of Contract (PCC)

Notes on Particular Conditions

The Particular Conditions (PC) complement the General Conditions (GC) to specify data and contractual requirements linked to the special circumstances of the country, the Employer, or the overall project.

Whenever there is a conflict, the provisions herein shall prevail over those in the GC.



PARTICULAR CONDITIONS OF CONTRACT (PCC)

Table of Contents

PC 1. Definitions	1
PC 5. Law and Language	2
PC 7. Scope of Facilities	2
PC 8. Time for Commencement and Completion	3
PC 9. Contractor's Responsibilities	4
PC 10. Employer's Responsibilities	4
PC 11. Contract Price	4
PC 13. Securities	4
PC 14. Taxes and Duties	5
PC 15. License/Use of Technical Information	5
PC 16. Confidential Information	6
PC 17. Representatives	6
PC 20. Design and Engineering	6
PC 22. Installation	6
PC 23. Test and Inspection	7
PC 24. Completion of the Facilities	7
PC 25. Commissioning and Operational Acceptance	7
PC 26. Completion Time Guarantee	8
PC 27. Defect Liability	8
PC 30. Limitations of Liability	8
PC 31. Transfer of Ownership	8
PC 34. Insurance	9
PC 39. Change in the Facilities	9
PC 40. Extension of Time for Completion	9
PC 44. Claims, Disputes and Arbitration	9
PC 45. Disputes and Arbitration	10



PARTICULAR CONDITIONS OF CONTRACT (PCC)

These Particular Conditions of Contract add, amend, modify or delete Clauses contained in the General Conditions of Contract, and shall take precedence over those contained in the General Conditions of Contract.

PC 1. Definitions	
PC 1.1	<p>'Construction Manager' shall mean the Site Manager responsible for Installation, Testing & Commissioning of the Equipment and appointed by the Contractor.</p> <p>'Contract (Part A)' shall constitute the portion of work contained in Schedule No. 1 to Schedule No. 4.</p> <p>'Contract (Part B)' shall constitute the portion of work contained in Schedule No. 8.</p> <p>'Contract' shall constitute the totality of work in Contract (Part A) and Contract (Part B).</p> <p>'Contract Price (Part A)' shall be the Grand Summary in Schedule No. 6.</p> <p>'Contract Price (Part B)' shall be the sum total of cost for the complete CMS duration in Schedule No. 8.</p> <p>'Contract Price' shall be the sum of Contract Price (Part A) and Contract Price (Part B).</p> <p>'Total Contract Price' is synonymous to Contract Price.</p> <p>The Employer is Mumbai Metro Rail Corporation Ltd. (MMRC).</p> <p>The Project Manager or his Authorised Representative is the General Consultant for Mumbai Metro Line 3, AECOM Asia Company limited, Louis Berger Group Inc., Egis Rail and PADECO Co. Ltd. Consortium (commonly referred to as MAPLE).</p>
PC 1.1	<p>Add the following to GC 1.1:</p> <p>'Engineer' means the technical representative of the Project Manager/ Employer of Mumbai Metro Line 3 Project authorised to interact with the Contractor for Facilities and CMS.</p> <p>'Equipment' is synonymous to Plant.</p> <p>'Final Payment' shall mean the last payment made to the Contractor for the work done by the Contractor in pursuance of the Contract.</p> <p>'Interim Payments' shall mean all payments made to the Contractor for satisfactory compliance of a part of the Contractor's Obligations in pursuance of the Contract other than the Final Payment.</p> <p>'Machine' is synonymous to Plant.</p> <p>'Machinery & Plant' abbreviated, as M&P is synonymous to Plant & Equipment.</p> <p>'Performance Certificate (Facilities)' means the Performance Certificate issued by the Project Manager on completion of all obligations of the Contractor in the Part A of the Contract.</p> <p>'Performance Certificate (CMS)' means the Performance Certificate issued by the Employer on completion of all obligations of the Contractor in Part B of the</p>



	<p>Contract.</p> <p>‘Proprietary Information’ means any information or data including without limitation any written, printed or electronic documents, manufacturing, technical, registration and business information, sales, distribution and marketing data, samples, models, intellectual or industrial property including any patent, invention, copyright, design (whether or not it may be registered), trade secret, circuit layout design or tight in relation to circuit layouts, applications for registration of any such items, rights to confidential information, technical information, processes, techniques and know-how.</p> <p>‘Site Engineer’ shall mean the Engineer nominated by the Contractor or his Eqpt Project Manager for Installation, Testing & Commissioning of the Facilities as defined in Clause 1.1.1 of Section III, Part 1.</p>
PC 1.2	<p>Insert the following:</p> <p>Abbreviations:</p> <p>AICPI- All India Consumer Price Index</p> <p>BDS- Bid Data Sheet</p> <p>DDP- Delivered Duty Paid</p> <p>CMRS- Commissioner of Metro Safety</p> <p>CMS- Comprehensive Maintenance Service</p> <p>Eqpt- Equipment</p> <p>EQC- Evaluation & Qualification Criteria</p> <p>FOR- Free on Rail/ Road</p> <p>GCC- General Conditions of Contract</p> <p>GS- General Specifications</p> <p>ITB- Instructions to Bidders</p> <p>MMRC- Mumbai Metro Rail Corporation Ltd</p> <p>MMRDA- Mumbai Metropolitan Regional Development Authority</p> <p>OEM- Original Equipment Manufacturer</p> <p>PCC- Particular Conditions of Contract</p> <p>RDSO- Research, Design & Standards Organization</p> <p>TS- Technical Specifications</p> <p>WPI- Wholesale Price Index</p>
PC 5. Law and Language	
PC 5.1	The Contract shall be governed by and interpreted in accordance with the laws of Republic of India.
PC 5.2	The ruling language of the Contract is English.
PC 7. Scope of Facilities	
PC 7.3	The period for supply of Spare Parts required for the Operation and Maintenance of



	<p>the Facilities shall be up to 12 years after issue of Operational Acceptance Certificate. The price of such Spare Parts and Consumables shall be added to the Contract Price (Part A) corresponding to the value of spares/consumables ordered during the execution of Contract (Part A).</p> <p>Contractor shall carry sufficient inventories to ensure an ex-stock supply of all spares for the Plant. Spare parts and components (other than consumable spares) shall be supplied as promptly as possible, but at the most within six (6) months of placing the order. In addition, in the event of termination of the production of spare parts, advance notification for a minimum period of 6 months shall be made to the Employer of the pending termination, to permit the Employer to procure the needed requirement. Following such termination, the Contractor will furnish to the extent possible and at no cost to the Employer the blueprints, drawings and specifications of the spare parts, if requested.</p>
PC 7.4	<p>Add a new Sub-Clause 7.4:</p> <p>The Contractor shall provide his own lifting facilities at the port, transshipment points and depot for loading and unloading heavy equipment. The Contractor shall, however, be allowed to use any necessary Depot facilities such as electrical power, material handling facilities, if available, for assembly, inspection, testing, trials, commissioning and repairs (if any) to equipment, subject to availability. The Employer shall, however, not be responsible for availability, adequacy, reliability and safety of the facilities provided to the Contractor.</p> <p>The finished off-shore manufactured plant as well as Spares, Jigs, Fixtures, Special tools and Testing and Diagnostic equipment, etc. required to be delivered directly in the MMRC depot at site from the Indian Port shall be considered on DDP-Delivered Duty Paid basis with sale taking place at High Seas. However, the responsibility, risks and liabilities arising on account of import and delivery of these goods at site, i.e. freight, transportation, Insurance, unloading, custom clearance, inland transportation, unloading at site as specified by the Employer, etc. lie with the Contractor.</p>
PC 8. Time for Commencement and Completion	
PC.8.1	<p>The Contractor shall commence work on the Facilities from the Effective Date for determining Time for Completion as specified in the Contract Agreement.</p>
PC 8.2	<p>The Time for Completion of the Facilities shall be as per "APPENDIX 1- KEY DATES", Section VI-A General Specification, Part 2.</p> <p>The Comprehensive Maintenance service shall be for the period of "DLP and followed by 5 years post-DLP".</p>



PC 9. Contractor's Responsibilities	
PC.9.2	<p>The Contractor confirms that he has entered into this Contract related to the Facilities on the basis of proper examination of the data provided by the Employer and on the basis of information that the Contractor could have prudently obtained from data made available to the Contractor by the Employer as of the Base Date.</p> <p>The Contractor acknowledges that any failure to acquaint itself with all such data and information shall relieve his responsibility for properly estimating the difficulty or cost of successfully performing its obligations under the Contract.</p>
PC 10. Employer's Responsibilities	
PC 10.2	<p>Insert the following sentences at the end of GC Sub-Clause 10.2:</p> <p>Access and Possession to the site may not be exclusive to the Contractor for the purpose of Installation, Testing and Commissioning of the Facilities. Shared access shall be provided for the above specified work.</p> <p>For the above work of the Facilities, the Contractor may set up his office or install a portable cabin on the site allotted to him for this work. The Contractor will be provided, subject to availability, a total space approximately up to maximum 20 sq. m. at (or near) depot for the setting up of Contractor's site offices and stores, and for working on the Facilities. This site office shall be built after obtaining the approval of Employer for its broad design.</p> <p>For the work of Comprehensive Maintenance Service, the Employer shall provide space in the Maintenance workshop for documentation, etc. of a suitable size as deemed fit by the Employer.</p>
PC 10.5	<p>Replace GC Sub-Clause 10.5 with the following:</p> <p>The Contractor shall provide adequate number of properly qualified operating personnel (during Testing & Commissioning stage) and maintenance personnel (during CMS period). He shall also supply and make available all lubricants, chemicals and other materials required during Pre-commissioning, Commissioning and Guarantee Tests, at or before the time specified in the program furnished by the Contractor under GC Sub-Clause 18.2 hereof and in the manner thereupon specified or as otherwise agreed upon by the Employer and the Contractor.</p>
PC 11. Contract Price	
PC 11.2	<p>The Part A of the Contract (Facilities) & Part B of the Contract (CMS during-DLP) is a Fixed Price Contract and shall not be adjusted for any Price Adjustment to the Contract Price.</p> <p>The Part B of the Contract (CMS Post-DLP) shall be adjusted for Price Adjustment in accordance with Clause 2, Appendix 2, Contract Forms, Section IX, Part 3.</p>
PC 13. Securities	
PC 13.3.1	<p>Replace GC Sub-Clause 13.3.1:</p> <p>The Contractor shall, within twenty-eight (28) days of the receipt of the Letter of Acceptance, provide a security for the due performance of the Contract for an amount equalling 10% of the Contract Price in the forms specified in these bidding</p>



	documents.
PC 13.3.2	The Performance Security shall be in the form of a Bank Guarantee as per the Form CF3, Section IX, Contract Forms, Part 3 as applicable and shall be issued or confirmed by a Scheduled Bank in India.
PC 13.3.3	<p>The Performance Security shall be released as under:</p> <p>a) 40% within 28 days after satisfactory completion of 365 days from the start of DLP.</p> <p>b) 40% within 28 days after satisfactory completion of DLP.</p> <p>c) 20% within 42 days after satisfactory completion of post-DLP CMS.</p> <p>Note: The Contractor may, if considered necessary, furnish separate Bank Guarantees which can be released at different time intervals.</p>
PC 14. Taxes and Duties	
PC 14.2	This Sub-Clause is deleted.
PC 14.3	<p>Replace GC Sub-Clause 14.3 with the following:</p> <p>Without prejudice to the Provisions made in Clause 1.2.4, Clause 1.2.5, Clause 1.2.6 & Clause 1.2.7 of Section IV-B, Part 1, if any tax exemptions, reductions, allowances or privileges may be available to the Contractor in the country where the Site is located, the Employer shall provide necessary supporting documents, where admissible, to enable the Contractor to benefit from any such tax savings to the maximum allowable extent.</p>
PC 15. License/Use of Technical Information	
PC 15.2	<p>Insert the following sentences at the end of GC Sub-Clause 15.2:</p> <p>The Contractor declares that other than Licensed Proprietary Information, all material and information collected or developed by the Contractor or any Sub-Contractor throughout the performance of the Contract or related thereto, including the Design, Manuals, all documents, drawings, opinion papers, analyses, ideas data, assessments, pre-final copies and any other written or unwritten product of the Contract, will remain in the hands of the Contractor or applicable Sub-Contractor, without derogating from the right of unlimited use by the Employer at no additional cost to the Employer.</p> <p>Notwithstanding the foregoing, the Contractor agrees that if the Employer demonstrates that such Work Products are not applicable to other projects and were not independently developed by or for the Contractor without reference to this Contract or the Works hereunder, then the rights in such work products will belong solely to the Employer and will be deemed the Employer's Proprietary Information, and neither the Contractor nor anyone on its behalf will have any claim or right (including any intellectual property right) with respect thereto, except the right to indicate its name on the applicable work product. In this case the Employer will be entitled to make any reasonable use of the work product at its sole discretion.</p> <p>Any software or computer program developed for effective operation of the Facilities shall be handed over to the Employer/ Project Manager or kept in safe custody at the site for quicker restoration of the functioning of the Facilities.</p>



PC 16. Confidential Information	
PC 16.2	Replace GC Sub-Clause 16.2 with the following: Contractor and Employer shall treat the details of the Contract as private and confidential, except to the extent necessary to carry out their respective obligations under the Contract or to comply with applicable Laws. Each of them shall not publish or disclose any particulars of the Contract prepared by the other Party without the previous agreement of the other Party.
PC 17. Representatives	
PC 17.1	Insert the following sentences at the end of GC Sub-Clause 17.1: The Project Manager may from time to time assign duties and delegate authority to assistants and may also revoke such assignment or delegation. These assistants may include an Engineer, and/or Independent Inspectors appointed to inspect and/or test items of Facilities and/or materials.
PC 20. Design and Engineering	
PC 20.3.1	Replace GC Sub-Clause 20.3.1 with the following: The Contractor shall prepare or cause its Sub-Contractors to prepare and furnish to the Project Manager the documents required in the Employer's Requirement VI-A & VI-B, documents required to satisfy all regulatory approvals including documents required for CMRS and RDSO approval, where required, as built documents and Operation & Maintenance manuals for Approval or Review, for its approval or review as specified and in accordance with the requirements of GC Sub-Clause 18.2 (Program of Performance). Any Part of the Facilities covered by or related to the documents to be approved by the Project Manager shall be executed only after the Project Manager's approval thereof.
PC 20.3.2 to 20.3.7	GC Sub-Clauses 20.3.2 through 20.3.7 shall apply to those documents requiring the Project Manager's approval, but not to those furnished to the Project Manager for its review only.
PC 20.3.5	Replace GC Sub-Clause 20.3.5 with the following: If any dispute or difference occurs between the Employer and the Contractor in connection with or arising out of the disapproval by the Project Manager of any document and/or any modification(s) thereto that cannot be settled between the Parties within 28 days, then the Project Manager shall give instructions as to whether and if so, how, performance of the Contract is to proceed. The Contractor shall proceed with the Contract in accordance with the Project Manager's instructions. The dispute shall be resolved through arbitration and the Contractor shall be reimbursed by the Employer, if the Arbitrator(s) uphold the Contractor's view on the dispute, for any additional costs incurred by reason of such instructions and shall be relieved of such responsibility or liability in connection with the dispute and the execution of the instructions, as the Arbitrator(s) shall decide.
PC 22. Installation	
PC 22.2.5	Working Hours:



	<p>Normal working hours will be from 9:00 AM to 6:00 PM with one-hour lunch break. Any change in Normal working hours shall be advised by the Project Manager or the Employer.</p> <p>Multiple shifts involving work at night or outside normal working hours is permitted for all operations provided temporary lighting equipment as per a layout issued with a Notice from the Project Manager, shall be provided, installed, maintained for the duration of the Contract and removed after completion of work by and at the expense of the Contractor.</p> <p>The Contractor shall allow in his construction programme for local festivals that are not included in the list of Maharashtra public holidays. No extra payment will be made to the Contractor for the provision of such measures.</p>
PC 22.2.8	<p>Replace GC Sub-Clause 22.2.8 with the following: Funeral Arrangements: In the event of the death of any of the Contractor's Personnel or accompanying members of their families, the Contractor shall be responsible for making the appropriate arrangements for their return or burial at Contractor's own risk and cost. The Contractor shall indemnify both the Employer and Project Manager for any harms/loss.</p>
PC 23. Test and Inspection	
PC 23.6	<p>Add the following as second Paragraph to GC Sub-Clause 23.6: If such rejection and retesting cause the Employer or Project Manager or their Representatives to incur additional costs, such costs shall be recoverable from the Contractor by the Employer and may be deducted by the Employer from any sum due, or to become due, to the Contractor.</p>
PC 23.7	<p>Replace GC Sub-Clause 23.7 with the following: In accordance with the provisions of Sub-clause 45.1, in case of any dispute or difference of opinion, the work shall be continued as per the directions of the Project Manager or the Employer and the matter may be referred, if considered necessary, to arbitration.</p>
PC 24. Completion of the Facilities	
PC 24.2	Delete the Sub-Clause
PC 24.3	Delete the Sub-Clause
PC 25. Commissioning and Operational Acceptance	
PC 25.1.2	<p>Replace GC Sub-Clause 25.1.2 with the following: The Contractor shall supply the operating and maintenance personnel for commissioning of the Facilities or any part thereof. The Contractor shall also provide the spares, lubricants, facilities, services and other matters required for commissioning of the Facilities or any part thereof.</p>
PC 25.2.2	The Guarantee test of the Facility or the relevant part thereof needs to be completed within the period of 180 days from the date of completion.
PC 25.3.1 (b)	<p>Add the following as Second paragraph to GC Sub-Clause 25.3.1(b): In such a case, the Guarantee test shall be conducted by the Contractor latest by the end of DLP as and when facilities are available for carrying out this test.</p>



PC 26. Completion Time Guarantee	
PC 26.2	<p>The liquidated damages shall be as specified in Appendix 1, Contract Key Dates & Access Dates, Section VI-A, Part 2.</p> <p>The aggregate amount of such liquidated damages is also given in Appendix 1, Contract Key Dates & Access Dates, Section VI-A, Part 2.</p>
PC 26.3	No bonus will be given for earlier Completion of the Facilities or Part thereof.
PC 27. Defect Liability	
PC 27.2	<p>Replace the first sentence in GC Sub-Clause 27.2 with the following: Defect Liability Period (DLP)</p> <p>The Defect Liability Period for the Facility shall commence from the date of issue of Operational Acceptance Certificate and expire twenty-four (24) months thereafter.</p>
PC 27.7	Reasonable period of time shall be taken as 14 days.
PC 27.8	<p>Replace GC Sub-Clause 27.8 with the following:</p> <p>If a defect is made good under this GC 27, the Defect Liability Period for the item which has been made good shall extend for a period of twenty-four (24) months from the date the defect is rectified. However, in no event shall the Defect Liability Period extend beyond forty-eight (48) months after the date of Operational Acceptance Certificate.</p>
PC 27.10	<p>Add new GC Sub-Clause 27.10:</p> <p>Upon satisfactory completion of DLP of the Facilities, the Project Manager shall issue the "Performance Certificate (Facilities) for the satisfactory performance of the Part A of the Contract", stating the date on which the Contractor completed his obligations under the Contract (Part A).</p> <p>The Project Manager shall issue the Performance Certificate (Facilities) within 28 days after the latest of the expiry dates of the Defect Liability Period for Contract and after the Contractor has supplied all the Documents required under the Contract. A copy of the Performance Certificate (Facilities) shall be issued to the Employer.</p> <p>Upon satisfactory completion of CMS (Part B of the Contract), the Employer shall issue the "Performance Certificate (CMS)" for the satisfactory performance of the Part B of the Contract, stating the date on which the Contractor completed his obligations under the Contract (Part B).</p>
PC 30. Limitations of Liability	
PC 30.1 (b)	The multiplier of the Contract Price is: 1
PC 31. Transfer of Ownership	
PC 31.1	<p>Replace GC Sub-Clause 31.1 with the following:</p> <p>Ownership of the Plant (including spare Parts) to be imported into the country where the Site is located shall be transferred to the Employer upon having delivered to the Site (MML3 Depot).</p>



PC 34. Insurance	
PC 34.6	Delete 2nd sentence in this Sub-Clause 34.6.
PC 39. Change in the Facilities	
PC 39.2.7	Replace the last para of GC Sub-Clause 39.2.7 with the following: If the Contractor and the Employer cannot reach agreement within sixty (60) days from the date of issue of the Pending Agreement Change Order, then the matter shall be resolved through Arbitration and the Contractor shall be reimbursed by the Employer, if the Arbitrator(s) uphold the Contractor's view on the dispute, for any additional costs incurred by reason of such instructions and shall be relieved of such responsibility or liability in connection with the dispute and the execution of the instructions, as the Arbitrator(s) shall decide.
PC 40. Extension of Time for Completion	
PC 40.2	Replace the 1st para of GC Sub-Clause 40.2 with the following: Except where otherwise specifically provided in the Contract, the Contractor shall submit to the Project Manager a notice of a claim for an extension of the Time for Completion, together with particulars of the event or circumstance justifying such extension soon after the commencement of such event or circumstance. As soon as reasonably practicable after receipt of such notice and supporting particulars of the claim, the Employer and the Contractor shall agree upon the period of such extension. In the event that the Contractor and the Employer do not reach an agreement, then the Project Manager shall give instructions as to whether and if so, how, performance of the Contract is to proceed. The Contractor shall proceed with the Contract in accordance with the Project Manager's instructions. The dispute shall be resolved through arbitration and the Contractor shall be reimbursed by the Employer, if the Arbitrator(s) uphold the Contractor's view on the dispute, for any additional costs incurred by reason of such instructions and shall be relieved of such responsibility or liability in connection with the dispute and the execution of the instructions, as the Arbitrator(s) shall decide.
PC 44. Claims, Disputes and Arbitration	
PC 44.1	Replace the last para with the following: In the event that the Contractor and the Employer cannot agree on any matter relating to a claim, either Party may refer the matter to arbitration as per Clause PC 45.5.
PC 44.2	Add new Sub-Clause PC 44.2: Employer's Claims If the Employer considers himself to be entitled to any payment under any Clause of these Conditions or otherwise in connection with the Contract, and/or to any extension of the Defects Liability Period, the Employer or the Project Manager shall give notice and Particulars thereof to the Contractor. The notice shall be given as soon as practicable and no longer than 28 days after the Employer became aware, or should have become aware, of the event or circumstances giving rise to the claim. A notice relating to any extension of the Defects Liability Period shall be given before the expiry of Defects Liability Period.



	<p>The Particulars shall specify the Clause or other basis of the claim and shall include substantiation of the amount and/or extension to which the Employer considers himself to be entitled in connection with the Contract.</p> <p>The Employer/ Project Manager shall determine</p> <p>(i) the amount (if any) which the Employer is entitled to be paid by the Contractor, and/or</p> <p>(ii) the extension (if any) of the Defects Liability Period.</p> <p>This amount as at (i) above may be included as a deduction in the Contract Price and Payment Certificates. The Employer shall only be entitled to set off against or make any deduction from an amount certified in a Payment Certificate, deduct the same from Performance Security or to otherwise claim against the Contractor, in accordance with this Sub- Clause.</p> <p>In the event that the Contractor and the Employer cannot agree on any matter relating to a claim, either Party may refer the matter to arbitration as per clause PC 45.5.</p>
PC 45. Disputes and Arbitration	
PC 45.1	<p>Replace GC Sub-Clause 45.1 with the following:</p> <p>There will be no Dispute Board appointed for this Contract.</p>
PC 45.2	Deleted.
PC 45.3	Deleted
PC 45.4	<p>Replace GC 45.4 with the following:</p> <p>In case of any dispute between the Parties arising out of or in connection with the Contract, both Parties shall attempt to settle the dispute amicably. In case of failure to reach a settlement on the full or a part of the dispute or if the Parties agree otherwise, the case shall be settled through Arbitration by a sole Arbitrator. Unless both Parties agree otherwise, arbitration may be commenced on or after the fifty-sixth (56th) day after the day on which notice of intention to commence arbitration was given, even if no attempt at amicable settlement has been made.</p>
PC 45.5	<p>Replace GC Sub-Clause 45.5 with the following:</p> <p>Arbitration shall be conducted as per Indian Arbitration and Conciliation Act 1996 (as amended from time to time):</p> <p>The place of arbitration shall be any International Arbitration Centre located in India and the arbitration shall be conducted in the language for communications defined in GC Sub-Clause 5.3 (Law and Language).</p>
PC 45.6	Deleted
PC 45.7	Deleted

----- End of Section VIII -----



BIDDING DOCUMENTS



MUMBAI METRO LINE 3 (COLABA-BANDRA-SEEPZ)

CONTRACT MM3-CBS-DEQ-9-02

Design, Manufacture, Supply, Installation, Testing, Commissioning
and Comprehensive Maintenance Service of
Automatic Train Wash Plant
for Project "Mumbai Metro Line-3"

Part 3 Conditions of Contract and Contract Forms

Section IX Contract Forms

January - 2020

**Mumbai Metro Rail Corporation Ltd
MMRC Line 3 Transit Office,
Wing A, Block E,
Bandra-Kurla Complex,
Bandra (East), Mumbai- 400 051, India.**



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Bidding Documents

Composition of Documents

Part 1	Bidding Procedure
Section I	Instructions to Bidders
Section II	Bid Data Sheet
Section III	Evaluation and Qualification Criteria
Section IV-A	Bidding Forms
Section IV-B	Pricing Document
Section V	Eligible Source Countries of Japanese ODA Loans
Part 2	Employer's Requirements
Section VI-A	Employer's Requirements – General Specifications
Section VI-B	Employer's Requirements – Technical Specifications
Part 3	Conditions of Contract and Contract Forms
Section VII	General Conditions of Contract (GCC)
Section VIII	Particular Conditions of Contract (PCC)
Section IX	Contract Forms
Section X	Special Conditions for Comprehensive Maintenance Service
Part 4	Drawings
Section XI	Drawings



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CONTRACT FORMS TABLE OF CONTENTS

CF1 -Notification of Award - Letter of Acceptance.....	1
CF2- Contract Agreement.....	2
Appendix 1- Terms and Procedures of Payment	6
Appendix 2- Price Adjustment	13
Appendix 3- Insurance Requirements.....	15
Appendix 4- Time Schedule	18
Appendix 5- List of major items of plants & installation services & Approved sub-contractor	19
Appendix 6- Scope of Works and Supply (ies) by the Employer	20
CF3- Performance Security Form - Bank Guarantee.....	21
CF4- Bank Guarantee Form for Advance Payment	23



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CF1 -Notification of Award - Letter of Acceptance

(On letter head paper of the Employer)

(----- dd-mm-yyyy -----)

To: [-----name and address of the Contractor-----]

Subject: Notification of Award of Contract No. MM3-CBS-DEQ-9-02

This is to notify you that your Bid dated (----date----) for execution of “ Design, Manufacture, Supply, Installation, Testing & Commissioning” (Part A) of ‘**Automatic Train Wash Plant**’ (MM3-CBS-DEQ-9-02 for the ‘Contract Price (Part A)’ in the aggregate of (----amount in words and figures-----) (-----name of currency-----), and for the Comprehensive Maintenance Service of the said Equipment (Part B) for the ‘Contract Price (Part B)’ in the aggregate of (----amount in words and figures-----) (-----name of currency-----) respectively with a Total Contract Price (also termed as Contract Price) in the aggregate of (----amount in words and figures-----) (-----name of currency-----), as corrected and modified in accordance with the Instructions to Bidders is hereby accepted by our Agency.

You are requested to furnish the Performance Security @ 10% of the Contract Price for the work of “Design, Manufacture, Supply, Installation, Testing & Commissioning and Comprehensive Maintenance” of ‘**Automatic Train Wash Plant**’ within twenty-eight (28) days in accordance with the Conditions of Contract, using for that purpose the Performance Security Form, CF3, Section IX, Contract Forms, Part 3.

Authorized Signature:

Name and Title of Signatory:

Name of Agency:



CF2- Contract Agreement

THIS AGREEMENT is made the _____ day of _____, 2019

BETWEEN

- (1) Mumbai Metro Rail Corporation Ltd., a corporation incorporated under the laws of India and having its principal place of business at Mumbai Metro Rail Corporation Ltd, MMRCL Line 3 Transit Office, Wing 'A', 'E' Block, Bandra-Kurla Complex, Bandra (East), Mumbai- 400 051, India, (hereinafter called "the Employer"),
- and
- (2) (-----name of Contractor-----), a corporation incorporated under the laws of (-----Country of Contractor-----) and having its principal place of business at (----address of Contractor-----), (hereinafter called "the Contractor").

WHEREAS the Employer desires to engage the Contractor for the 'Design, Manufacture, Installation, Testing & Commissioning' (Part A) of 'Automatic Train Wash Plant' (hereinafter called "the Facilities") and for the provision of "Comprehensive Maintenance Service" of the said Equipment (Part B) during the period of DLP followed by 5 years of post-DLP and the Contractor has agreed to such engagement upon and subject to the terms and conditions hereinafter appearing.

NOW IT IS HEREBY AGREED as follows:

Article 1.

Contract Documents

- 1.1 Contract Documents (Reference General Conditions ("GC") Clause 2).
The following documents shall constitute the Contract between the Employer and the Contractor, and each shall be read and construed as an integral part of the Contract:
- a) This Contract Agreement and the Appendices including hereto
 - b) The Letter of Acceptance
 - c) Addenda
 - d) Letter of Technical Bid
 - e) Letter of Price Bid
 - f) Special Conditions for Comprehensive Maintenance Service (Part 3, Section X)
 - g) Particular Conditions of Contract (Part 3, Section VIII)
 - h) General Conditions of Contract (Part 3, Section VII)
 - i) Employer's Requirements (Part 2, Section VI-B)
 - j) Employer's Requirements (Part 2, Section VI-A)
 - k) Pricing Document (Part-1, Section IV-B)
 - l) Other completed Bidding Forms submitted with the Bid
 - m) Evaluation and Qualification Criteria (Part-1, Section III)
 - n) Reference Drawings (Part 4, Section XI)
 - o) Pre-bid and post-bid clarifications and reply thereof
 - p) Acknowledgment of Compliance with Guidelines for Procurement under Japanese ODA Loans
 - q) Any other documents _____



1.2 Order of Precedence (Reference GC Clause 2)

In the event of any ambiguity or conflict between the Contract Documents listed above, the order of precedence shall be the order in which the Contract Documents are listed in Article 1.1 (Contract Documents) above.

1.3 Definitions (Reference GC Clause 1)

Capitalized words and phrases used herein shall have the same meanings as are ascribed to them in the General Conditions.

Article 2.

Contract Price
and Terms of
Payment

2.1 Contract Price (Reference GC Clause 11)

The Employer hereby agrees to pay to the Contractor the Contract Price in the aggregate of (*---- amount(s) in foreign currency (ies) in words and figures -----*), and (*----- amount in local currency in words and figures-----*) in consideration of the performance by the Contractor of its obligations hereunder.

The Contract Price (Part A) of the Contract shall be the aggregate of (*--- ----- amount(s) in foreign currency (ies) in words and figures -----*), and (*----- amount in local currency in words and figures -----*) as specified in Schedule No. 6 (Grand Summary), or such other sums as may be determined in accordance with the terms and conditions of the Contract

And

The Contract Price (Part B) of the Contract shall be the aggregate of (*--- - amount(s) in foreign currency (ies) in words and figure s-----*), and (*----- amount in local currency in words and figures -----*) as specified in Schedule No. 8 (Comprehensive Maintenance Service), or such other sums as may be determined in accordance with the terms and conditions of the Contract.

2.2 Terms of Payment (Reference GC Clause 12)

The Contract Price shall be paid by the Employer to the Contractor at the times, in the manner, and in accordance with the provisions of Appendix 1 (Terms and Procedures of Payment) hereto.

The Employer shall instruct its bank to issue an irrevocable confirmed Letter of Credit made available to the Contractor for payments in foreign currencies in a bank in the country of the Contractor. The credit shall be for an amount of (*----- amount equal to the total named in Schedule No. 1 less the advance payment to be made for Plant and Equipment supplied from abroad -----*); and shall be subject to the Uniform Customs and Practice for Documentary Credits 1993 Revision, ICC Publication No. 600.



In the event that the amount payable under Schedule No. 1 is adjusted in accordance with GC 11.2 or with any of the other terms of the Contract, the Employer shall arrange for the documentary credit to be amended accordingly.

Article 3.
Effective Date

3.1 Effective Date (Reference GC Clause 1)

The Effective Date, from which the Time for Completion of the Facilities shall be counted, is the date of execution of this Contract Agreement for and on behalf of the Employer and the Contractor.

Article 4.
Communications

4.1 The address of the Employer for notice purposes, pursuant to GC Clause 4.1 is Mumbai Metro Rail Corporation Ltd, MMRC Line 3 Transit Office, Wing 'A', 'E' Block, Bandra-Kurla Complex, Bandra (East), Mumbai 400 051, India.

4.2 The address of the Contractor for notice purposes, pursuant to GC Clause 4.1 is (----- *Contractor's address* -----).

Article 5.
Appendices

5.1 The Appendices listed in the attached List of Appendices shall be deemed to form an integral part of this Contract Agreement.

5.2 Reference in the Contract to any Appendix shall mean the Appendices attached hereto, and the Contract shall be read and construed accordingly.

IN WITNESS WHEREOF the Employer and the Contractor have caused this Agreement to be duly executed by their duly authorized representatives the day and year first above written.

Signed by, for and on behalf of the Employer

[Signature]

[Title]

in the presence of _____

Signed by, for and on behalf of the Contractor

[Signature]

[Title]

in the presence of ____



APPENDICES

APPENDIX 1	Terms and Procedures of Payment
APPENDIX 2	Prices Adjustment
APPENDIX 3	Insurance Requirements
APPENDIX 4	Time Schedule
APPENDIX 5	List of Major Items of Plant and Installation Services and List of Approved Sub-Contractors
APPENDIX 6	Scope of Works and Supply by the Employer
APPENDIX 7	List of Documents for Approval or Review
APPENDIX 8	Functional Guarantees



Appendix 1- Terms and Procedures of Payment

In accordance with the provisions of GC Clause 12 (Terms of Payment), the Employer shall pay the Contractor in the following manner and at the following times, on the basis of the Contract Price given in the Section on Price Schedules.

Payments will be made in the currencies quoted in the Price Schedules by the Contractor.

Applications for payment in respect of part deliveries may be made by the Contractor as work proceeds. However, not more than one invoice for payment shall be accepted in any month.

ADVANCE PAYMENT

An Advance Payment up to the extent of 10% of the Contract Price (Part A) will be given on application from the Contractor and on receipt of a security, in the form of Bank Guarantee, for an amount equal to the Advance Payment and in any of the currency(-ies) prescribed in the Price Schedules.

Advance payment shall be made within 28 days of the receipt of application and the required Bank Guarantee.

The Advance Payment shall be recovered in two equal instalments from the payments due to the Contractor when the payments, including the Advance Payment, reach a level of 40% and 80% of the Contract Price of the Contract respectively. Where the payments reach a level of 80% directly, full amount of Advance Payment shall be recovered from the payments due to the Contractor.

Terms of Payment

Part A of the Contract

All payments against the work, except the Final payment, to Contractor's shall be made in accordance with GC Clause 12 within forty-two (42) days of the receipt of required documents. The final payment shall be made within fifty-six (56) days of the receipt of required documents

TERMS OF PAYMENT

Schedule No. 1. Plant and Mandatory spare parts to be supplied from abroad

- i) In respect of Plant and Equipment supplied from abroad, due payments against Price Schedule No. 1 and thereafter subject to recoveries if any, by way of liquidated damages, shall be made as mentioned below:
- 1) Ninety percent (90%) of the total or pro rata DDP amount of Schedule No. 1, derived as at i) above, on delivery at Depot site on submission of the following documents:
- Signed/ Certified commercial invoice of shipped items showing the description, quantity, and price of items shipped in duplicate.
 - Non-negotiable shipping documents / proof of dispatch (Bill of Lading/ Airway Bill).
 - Inspection Certificate issued by Employer's Representative after Factory Acceptance Test.



- (d) Insurance documents of shipped items.
 - (e) Works Test Certificate.
 - (f) Crate-wise packing list along with weight of each item in the list.
 - (g) Certificate of country of origin issued by the appropriate authority.
 - (h) Certified copy of Certificate of receipt of full supplies at Depot site.
- 2) Ten percent (10%) of the total DDP amount of Schedule No. 1 on issue of Completion Certificate as per Clause 24.5 or 24.6, Section VII, Part 3.

Schedule No. 2. Plant and mandatory spare parts to be supplied within the Employer's country

- i) In respect of Plant and Equipment supplied from within the country, due payments against Price Schedule No. 2 and thereafter subject to recoveries if any, by way of liquidated damages or any other account, shall be made as mentioned below:
- 1) Ninety percent (90%) of the total or pro rata FOR amount of Schedule No. 2, derived as at i) above, on delivery at Depot site on submission of the following documents:
- (a) Signed/ Certified commercial invoice of supplies delivered at Depot site showing the description, quantity, and price of items shipped in duplicate.
 - (b) Non-negotiable shipping documents / proof of dispatch (Bill of Lading/ Airway Bill)
 - (c) Inspection Certificate issued by Employer's Representative after Factory Acceptance Test.
 - (d) Insurance documents of shipped items
 - (e) Work Test Certificate.
 - (f) Packing List.
 - (g) Certified copy of Certificate of delivery of items at Depot site.
- 2) Ten percent (10%) of the total FOR amount of Schedule No. 2 for the respective Equipment on issue of Completion Certificate as per Clause 24.5 or 24.6, Section VII, Part 3.

Schedule No. 3. Design Services

- i) In respect of design services as in Schedule No. 3, the payments shall be made as % expressed below against each milestone in Table-1 below on receipt of Notice of No Objection from the Project Manager certifying the receipt and completeness of documents:

Table-1: Milestones

Item	Description	Percentage for Sub-Items
3.1	Submission and acceptance of the following: 1) Work Program 2) Design submission Program 3) Preliminary Design drawings.	40
3.2	Submission and acceptance of the following: 1) Final Design drawings. 2) Safety Plan & Quality Plan 3) RAMS Plan	60



	4) Inspection & Testing Plan 5) 3-D model of Facilities in Revit Software	
	Total	100

Schedule No. 4. Installation, Testing & Commissioning, and Other Services

The amount quoted in Price Schedule No. 4 in respect of Installation, Testing & Commissioning Services shall be paid as under:

- 1) 70% of the total Price quoted in Schedule No 4 for the respective Equipment after completion of Installation, Testing & Commissioning as per Clause 25.1 (excluding Guarantee tests), Section VII, Part 3, completion of training of O&M staff of the Employer and on receipt of invoice with documents as given below:
 - a) Signed/ certified commercial Invoice in duplicate,
 - b) Completion Certificate issued by the Project Manager,
 - c) Certificate of completion of training to Employer's O&M staff.
 - d) Submission of Training Manual, O&M Manual and Spare parts catalogue,
- 2) 30% of the total Price quoted in Schedule No. 4 for the respective Equipment on, completion of Guarantee tests, all other Contractor's obligations and issue of Operational Acceptance Certificate/ deemed Operational Acceptance and on receipt of the following documents as below:
 - (a) Signed/ certified commercial Invoice in duplicate,
 - (b) Certificate of completion of Contractor's all obligations under this Contract.

Part B of the Contract

- 1) In accordance with the provisions of GC Clause 12 (Terms of Payment), the Employer shall pay the Contractor in the following manner and at the following times, on the basis of the Price Breakdown given in Schedule No. 8, Section IV-B. Payments will be made in the currencies quoted by the Contractor in the Price Schedule No. 8.
- 2) Payments for CMS shall be paid against every quarterly Payment Claim raised for CMS and upon completed items of Maintenance for preceding quarter to the satisfaction of Employer/ Operator as per the Contract Conditions and Clause 4, Section VI-B, Part 2. The price shall be adjusted as per the Price Adjustment detailed in Appendix 2, Section IX, Part 3.
- 3) 100% Payment will be provided against every quarterly Payment Claim raised for CMS provided to the satisfaction of Employer as per Contract Conditions for preceding quarter. Price adjustment is applicable to the prices quoted in Schedule no. 8.

Note: If the Employer fails to make any payment on its respective due date, the Employer shall pay to the Contractor interest on the amount of such delayed payment at the annual rate of three (3) percentage points above the discount rate (Repo rate in case of RBI) of the central bank in the country of the currency (ies) of payment.



Payment Procedure

Part A of the Contract

The procedure to be followed in applying for certification and making payments shall be as follows:

Application for Completed Items Certificate and Payment:

- 1) The Contractor shall be entitled to submit to the Project Manager Requests for Payment only upon the achievement of one or more of the Completed items described in the Schedules of Pricing Document (Section IV-B, Part 1) or milestones described in Table-1 above for Schedule No. 3. The Contractor shall not submit more than one request for payment in any month.
- 2) The Contractor shall submit a Statement in six copies to the Project Manager after the end of each schedule/ milestone, in a form approved by the Project Manager, showing in detail the amounts to which the Contractor considers himself to be entitled, together with supporting documents which shall include the relevant report on progress. The Statement shall include the following items, as applicable, which shall be expressed in the various currencies in which the Contract Price is payable, in the sequence listed.
- 3) Any amount due in respect of Completed Items under each Payment Schedule; (including Variations and items described in sub-paragraphs (a) to (d) below);
 - (a) Any amounts to be added and deducted for changes in legislation and changes in cost, in accordance with Part-3, Section VII Clause 14 [Taxes and Duties] and Sub-Clause 14.4;
 - (b) Any amount to be deducted as required for fulfilling statutory requirements;
 - (c) Any other additions or deductions which may have become due under the Contract or otherwise, including but not limited to those with Part-3, Section VII under Clause 44 [Contractor's Claims]; and the deduction of amounts certified in all previous Payment Certificates.
 - (d) Any amounts recoverable from the Contractor in accordance with the Contract for liquidated damages for not achieving key dates and or /milestones.

Issue of Payment Certificates

- 1) The Employer or the Person authorised by the Employer shall certify the supplies/items completed in accordance with the Pricing Document (Part 1 Section IV-B). This sheet shall be signed by the Authorised Person and presented along with the Contractors Payment Application to the Project Manager.
- 2) Where quantities/items are specified against Price Schedule, the Project Manager shall ensure all quantities submitted for payment have been completed and are fit for purpose with no outstanding NCR's, etc.
- 3) All certified quantities shall have supporting documents where specified and shall be submitted as part of the Contractor's application.
- 4) For payment against Foreign Currency portion as mentioned in Pricing Schedules, the Contractor shall issue a certificate of spending money in same currency(-ies) as part of supporting document with the application for payment to the satisfaction of Project Manager.



- 5) Thereafter, the Project Manager shall, on receiving the Statement and supporting documents from the Contractor, deliver to the Employer, with a copy to the Contractor, a Payment Certificate showing the amount which the Project Manager considers to be due; if no payment is considered to be due, the Project Manager shall promptly notify the Contractor accordingly.
- 6) Where only a part of the payment applied for is disputed, payment certificate shall be issued for the undisputed amount.

Issue of Final Payment Certificate.

- 1) The Final Payment Certificate for the completion of 'Facilities' shall be prepared after completion of the Contract towards 'Facilities' in all respects in accordance with the Contract as determined by the Project Manager (Refer GC Clause 23, 24, 25, & 26).
- 2) On receiving the Operational Acceptance, in accordance with Part 3, Section VII, GC Clause 25.3, the Project Manager shall issue, to the Employer with a copy to the Contractor, the Final Payment Certificate, which shall state:
 - (a) The amount which is finally due, and
 - (b) the balance (if any) due from the Employer to the Contractor or from the Contractor to the Employer, as the case may be after giving credit to the Employer for all amounts previously paid by the Employer and for all sums to which the Employer is entitled.

Payment- Interim and Final.

- 1) After issue of Payment Certificate by the Project Manager corresponding to Contractor's Request for Payment, payment of 100% of the certified Interim amounts shall be made by the Employer. The amount certified shall account for all deductions, including statutory deductions, recoveries for advances and any amounts due from the Contractor.
- 2) The Employer shall pay the amount certified in the Final Payment Certificate within 14 days from the date of issue of the Certificate.

The Employer reserves the right to carry out a post payment audit and/or technical examination of the Facilities, and the Final account, including all supporting vouchers, abstracts, etc., and to make a claim on the Contractor for the refund of any excess amount paid to him, if as a result of such examination, any over-payment to him is discovered to have been made in respect of any work done or alleged to have been done by the Contractor, under the Contract. If any under-payment is discovered, the Employer shall pay the same to the Contractor. Such payments or recoveries, however, shall not be subject to any interest.

Part B of the Contract

The procedure to be followed in applying for certification and making payments shall be as follows:

Application for Quarterly Certification of Work & Payment:

- 1) The Contractor shall be entitled to submit to the Employer requests for quarterly payments only upon the achievement of completion of the quarterly CMS described in the Schedule No. 8 of Pricing Document (Section IV-B, Part 1). The Quarterly Payment Certificate shall be issued by the Employer/ Representative/ Operator.



- 2) The Contractor shall submit the Payment Claim in four copies to the Employer after the end of each quarter, in a form approved by the Employer, showing in detail the amounts to which the Contractor considers himself to be entitled, together with supporting documents which shall include the relevant report on progress. The Statement shall include the following items, as applicable, which shall be expressed in the various currencies in which the Contract Price is payable, in the sequence listed:
- 3) Any amount due in respect of Completed Items under Schedule No. 8; (including Variations and items described in sub-paragraphs (a) to (c) below);
 - (a) Any amounts to be added and deducted for changes in taxes or levies, in accordance with Part 3, Section VII, Clause 14 [Taxes and Duties] and Sub-Clause 14.4;
 - (b) Any amount to be deducted as required for fulfilling statutory requirements;
 - (c) Any amounts recoverable from the Contractor in accordance with the Contract for any penalties imposed.

Issue of Quarterly Payment Certificates

- 1) The Employer or the person authorised by the Employer shall certify the supplies/items completed in accordance with Schedule No. 8 (Pricing Document, Part 1, Section IV-B) and this Appendix 1. This sheet shall be presented with the Contractor's Quarterly Payment Claim.
- 2) Where quantities/items are specified against Price Schedule, the Employer shall ensure all quantities submitted for payment have been completed and are fit for purpose with no outstanding NCR's, etc.
- 3) All certified quantities should have supporting documents where specified and shall be submitted as part of the Contractor's application.
- 4) For payment against Foreign Currency portion as mentioned in Pricing Schedules, the Contractor shall issue a certificate of spending money in same currency(-ies) as part of supporting document with the application for payment to the satisfaction of Employer.
- 5) Thereafter, the Employer shall, on getting certified statement of supplies/ items of work done make payment to the Contractor along with a payment certificate showing the amount which the Employer considers to be due; if no payment is considered to be due, the Employer shall issue the payment certificate with NIL amount due.
- 6) Where only a part of the payment applied for is disputed, payment certificate shall be issued for the undisputed amount.

Issue of Final Payment Certificate

- 1) The Final Payment Certificate for CMS shall be prepared in accordance with the Contract after completion of the CMS for the whole of contracted period for CMS in all respects as determined by the Employer (Clause 4, Section VI-B, Part 2).
- 2) The Employer shall, on completion of CMS for the whole of contracted period in accordance with Contract Conditions, issue to the Contractor, the Final Payment Certificate, which shall state:
 - (a) The amount which is finally due, and



- (b) The balance (if any) due from the Employer to the Contractor or from the Contractor to the Employer, as the case may be. After giving credit to the Employer for all amounts previously paid by the Employer and for all sums to which the Employer is entitled,

Payment– Interim and Final

- 1) After certification by the Employer, payment of 100% of the certified interim quarterly amount shall be made by the Employer on the issue of Payment Certificate. The amount certified shall account for all deductions, including statutory deductions, recoveries for advances and any amounts due from the Contractor.
- 2) The Employer shall pay the amount certified in the Final Payment Certificate on issue of the Final Payment Certificate.

The Employer reserves the right to carry out a post payment audit and/or technical examination of the Facilities, and the Final account, including all supporting vouchers, abstracts, etc., and to make a claim on the Contractor for the refund of any excess amount paid to him, if as a result of such examination, any over-payment to him is discovered to have been made in respect of any work done or alleged to have been done by the Contractor, under the Contract. If any under-payment is discovered, the Employer shall pay the same to the Contractor. Such payments or recoveries, however, shall not be subject to any interest.



Appendix 2- Price Adjustment

1. Price Adjustment (Part A):

- 1.1 The portion of the Contract for supply of Equipment is a fixed price contract and hence not subject to any Price Adjustment.

2. Price Adjustment (Part B):

- 2.1 The portion of the Contract for CMS during DLP is a fixed price contract and hence not subject to any Price Adjustment.
- 2.2 The portion of the contract for CMS Post-DLP shall be subjected to Price Adjustment as under:

The price shall be quoted at Present Value (corresponding to BASE DATE, viz. 28 days prior to latest Bid submission date) basis and shall be adjusted for each quarter.

The equated price shall be calculated as under:

$$P_n = \frac{P_0}{100} \left(15 + 50 \frac{C_n}{C_0} + 10 \frac{M_n}{M_0} + 10 \frac{E_n}{E_0} + 15 \frac{L_n}{L_0} \right), \text{ where}$$

P_n is the price calculated for the n^{th} quarter.

P_0 is the quoted price for the respective period, viz DLP/ post-DLP.

C_0 is Consumer Price Index for Industrial Workers (CPI (IW)) for Mumbai taken as the average of 3 months for the quarter corresponding to Base date.

C_n is the average of 3 months CPI (IW) for Mumbai of the quarter preceding the n^{th} Quarter.

M_0 is the WPI for category 'Manufacture of Machinery & Equipment (Commodity Code 1318000000) taken as the average of 3 months for the quarter corresponding to Base date.

M_n is the WPI for category 'Manufacture of Machinery & Equipment' taken as the average of 3 months WPI of the quarter preceding the n^{th} Quarter.

E_0 is the WPI for category 'Manufacture of Electrical Equipment (Commodity Code 1317000000) taken as the average of 3 months for the quarter corresponding to Base date.

E_n is the WPI for category 'Manufacture of Electrical Equipment' taken as the average of 3 months WPI of the quarter preceding the n^{th} Quarter.

L_0 is the WPI for category 'Lube Oils (Commodity Code 1202000009)' taken as the average of 3 months for the quarter corresponding to Base date.

L_n is the WPI for category 'Lube Oils' taken as the average of 3 months WPI of the quarter preceding the n^{th} Quarter.

The CPI (IW) shall be as published by Labour Bureau of Ministry of Labour and Employment, Govt of India.

The Commodity Codes shall be as given in WPI figures in the website of the 'Office of Economic Advisor', Govt of India.

3. Price Adjustment on Recommended Spares:

- 3.1 Employer may exercise the option to procure individual Spares listed in the Schedule No. 7, Price Schedule, Section IV-B, Part 1 at any time up to twelve (12) years from the date of issue of Operational Acceptance Certificate. The price quoted for these spares shall remain fixed till the issue of Operational Acceptance Certificate. Thereafter, the



Procurement Price shall be escalated on the basis of WPI published by Economic Advisor, Ministry of Commerce & Industry, Govt of India; <https://eaindustry.nic.in> (Commodity Code 1318000000, 1317000000, 1310030000 and 1202000009 for Mechanical (metallic) items, Electrical items, plastic & synthetic rubber and Lubricants respectively) from the month in which the Operational Acceptance Certificate is issued to the month corresponding to the date of Purchase Order.



Appendix 3- Insurance Requirements

Insurances to be Taken Out by the Contractor

In accordance with the provisions of GC Clause 34, the Contractor shall at its expense take out and maintain in effect, or cause to be taken out and maintained in effect, during the performance of the Contract, the insurances set forth below in the sums and with the deductibles and other conditions specified. The identity of the insurers and the form of the policies shall be subject to the approval of the Employer, such approval not to be unreasonably withheld.

a) **Cargo Insurance**

Covering loss or damage occurring, while in transit from the supplier's or manufacturer's works or stores until arrival at the site, to the facilities (including spare parts therefore) and to the construction equipment to be provided by the Contractor or its sub-contractors.

Data to be filled in by Bidder based on Bidder's quote in pricing documents.

Amount [in currency(ies)]	Deductible limits [in currency(ies)]	Parties insured [names]	From [place]	To [place]

The Contractor shall insure the plants, Facilities, all material and Contractor's document for not less than the full replacement cost including costs of demolition, removal and professional fee and profit.

b) **Installation All Risks Insurance**

Covering physical loss or damage to the Facilities at the Site, occurring prior to Operational Acceptance of the Facilities, with extended maintenance coverage for the Contractor's liability in respect of any loss or damage occurring during the Defect Liability Period while the Contractor is on the Site for the purpose of performing its obligations during the defect liability period.

Data to be filled in by Bidder based on Bidder's quote in pricing documents.

Amount [in currency(ies)]	Deductible limits [in currency(ies)]	Parties insured [names]

The Contractor shall insure the Works, plant, Material and Contractor's document including fire, theft, accidental damages and other natural calamities for not less than the full reinstatement cost including costs of demolition, removal and professional fee and profit.



c) **Third Party Liability Insurance**

Covering bodily injury or death suffered by third parties (including the Employer's Personnel) and loss of or damage to property (including the Employer's property and any parts of the Facilities that have been accepted by the Employer) occurring in connection with the supply and installation of the Facilities.

Amount [in currency(ies)]	Deductible limits [in currency(ies)]	Parties insured [names]	From [place]	To [place]

The Insurance shall cover for 0.8 million Indian rupees for any one incident and for unlimited number of incidents.

d) **Automobile Liability Insurance**

Covering use of all vehicles used by the Contractor or its Sub-Contractors (whether or not owned by them) in connection with the supply and installation of the Facilities. Comprehensive insurance in accordance with statutory requirements.

Automobile Liability should confirm to requirements of Indian Motor Vehicles Act.

e) **Workers' Compensation**

In accordance with the statutory requirements applicable in any country where the Facilities or any part thereof is executed. Each worker shall be insured as per "The Workmen's Compensation Act. 1923" and for not less than 0.8 million Indian rupees.

f) **Employer's Liability**

In accordance with the statutory requirements applicable in India where the Facilities or any part thereof is executed. Each worker shall be insured as per "The Workmen's Compensation Act. 1923" and for not less than 0.8 million Indian Rupees.

g) **Professional Indemnity**

The Contractor shall provide insurance cover for not less than 3% (three percent) of the Contract Price. The cover is for the financial consequences of professional negligence, following a breach of professional duty by way of neglect, error or omission, additionally, cover is provided in respect of any legal and other costs and expenses incurred, occurring in connection with the design and construction of the temporary and permanent works of the Facilities.

h) **Other Insurances:**

The Contractor is also required to take out and maintain at its own cost the following insurances: Not Applicable.

The Employer shall be named as co-insured under all insurance policies taken out by the Contractor pursuant to GC Sub-Clause 34.1, except for the Workers' Compensation and Employer's Liability Insurances, and the Contractor's Sub-Contractors shall be named as co-insurers under all insurance policies taken out by the Contractor pursuant to GC Sub-Clause 34.1,



except for the Cargo, Workers' Compensation and Employer's Liability Insurances. All insurer's rights of subrogation against such co-insureds for losses or claims arising out of the performance of the Contract shall be waived under such policies.

Insurances - To be taken out by the Employer

The Employer will not take out any insurance during the performance of the Contract.

The Contractor shall at its own expense take out, including paying any additional dues for any claim and maintain in effect during the performance and including the Defect Liability Period of the Contract all insurances as stated in the Specification and Contract Agreement.



Appendix 4- Time Schedule

[The Contractor shall be required to submit with its Bid a detailed program, normally in the form of a bar chart, showing how and the order in which it intends to perform the Contract and showing the key events requiring action or decision by the Employer. The attached schedule shall adhere to the Time(s) for Completion as given in key dates in Appendix 1, Section VI-A, Part 2.

The whole of the works shall be completed and delivered in stages (key dates) within time stipulated as shown in Appendix 1, Section VI-A, Part 2.



Appendix 5- List of major items of Plant & Installation services & Approved sub-contractor

A list of major items of Plant and Installation Services is provided below.

The following Subcontractor's and/or manufacturers are approved for carrying out the items of the Facilities indicated below. Where more than one Subcontractor are listed, the Contractor is free to choose between them, but it must notify the Employer of its choice in good time prior to appointing any selected Subcontractor. In accordance with GC Sub-Clause 19.1, the Contractor is free to submit proposals for Subcontractor's for additional items from time to time. No Subcontracts shall be placed with any such Subcontractor's for additional items until the Subcontractors have been approved in writing by the Employer and their names have been added to this list of Approved Subcontractor's.

Major Items of Plant and Installation Services	Approved Subcontractors/Manufacturers	Nationality



Appendix 6- Scope of Works and Supply (ies) by the Employer

- 1) The Wash Plant area of size of approx. 70 mts x 10 mts (tentative) shall be made available.
 - 2) The Water Tanks & Plant room shall be constructed by the Depot Civil Contractor.
 - 3) Electricity, water and compressed air, if available and in a position to be offered for use, may be given, on payment, by the Depot Civil Contractor. However, the Contractor shall keep his own arrangements ready and available, if required, for installation of the Facilities.
 - 4) The Contractor shall supply operating & maintenance personnel for Pre-commissioning, Testing and Commissioning of the Works. The Contractor shall also provide lubricants, detergents and other spares required for Pre-commissioning, Testing and Commissioning of the Works
 - 5) Employer's operating and maintenance staff may be present during the installation and commissioning phase for training purpose.
-



CF3- Performance Security Form - Bank Guarantee

(To be stamped in accordance with the Stamp Act of the Country of Issuing Bank)
[Guarantor letterhead or SWIFT identifier code]

Beneficiary: Mumbai Metro Rail Corporation Ltd, MMRCL Line 3 Transit Office, Wing 'A', 'E'
Block, Bandra-Kurla Complex, Bandra (East) Mumbai 400 051, India

Date: (-----date of issue-----)

PERFORMANCE GUARANTEE No.: (-----guarantee reference number-----)

Guarantor: (-----name and address of place of issue-----)

We have been informed that (----- name of Contractor ----- or ----- name of the joint venture -----)
(hereinafter called "the Applicant") has entered into Contract Agreement No. _____
dated _____ with the Beneficiary, for the execution of Design, Manufacture,
Supply, Installation, Testing & Commissioning of 'Automatic Train Wash Plant' MM3-CBS-
DEQ-9-02 for the Mumbai Metro Line 3 Project (hereinafter called "the Contract").

Furthermore, we understand that, according to the conditions of the Contract, a performance
guarantee is required.

At the request of the Applicant, we as Guarantor, hereby irrevocably undertake to pay the
Beneficiary any sum or sums not exceeding in total an amount of INR _____, EURO
_____, YEN _____ and/or USD
_____, such sum being payable upon receipt by us of the Beneficiary's
complying demand supported by the Beneficiary's statement, whether in the demand itself or in a
separate signed document accompanying or identifying the demand, stating that the Applicant is in
breach of its obligation(s) under the Contract, without the Beneficiary needing to prove or to show
grounds for its demand or the sum specified therein.

This performance guarantee amount consists of:

INR _____ and USD _____ towards the performance of the Contract; and

The Guarantee (s) shall be released as under:

- i) 40% within twenty-eight (28) days after satisfactory completion of 365 days from the start of
DLP as certified by the Project Manager.
- ii) 40% within Twenty-eight (28) days after satisfactory completion of DLP as certified by the
Project Manager.
- iii) 20% within Forty-two (42) days after satisfactory completion of CMS as certified by the
Project Manager.

This guarantee (s) shall expire no later than the later of:

- i) **First 40% shall expire no later than the later of**



- a) Within twenty-eight (28) days after satisfactory completion of 365 days from the start of DLP, or
- b) The _____(Expiry Date).
- ii) **Second 40% shall expire no later than the later of**
 - a) Within twenty - eight (28) days after satisfactory completion of DLP, or
 - b) The _____(Expiry Date).
- iii) **Balance 20% shall expire no later than the later of**
 - a) Within forty-two (42) days after satisfactory completion of CMS, or
 - b) The _____ (Expiry Date).

Consequently, any demand for payment under this guarantee must be received by the Guarantor at its office on or before that date.

This guarantee is subject to the Uniform Rules for Demand Guarantees (URDG) 2010 Revision, ICC Publication No. 758 (or subsequent ICC Publications).

SIGNATURE AND SEAL OF THE
GUARANTOR

NAME OF BANK -----

ADDRESS -----

DATE -----



CF4- Bank Guarantee Form for Advance Payment

(To be stamped in accordance with the Stamp Act of the Country of Issuing Bank)

[Guarantor letterhead or SWIFT identifier code]

Beneficiary: Mumbai Metro Rail Corporation Ltd, MMRCL Line 3 Transit Office, Wing 'A', 'E'
Block, Bandra-Kurla Complex, Bandra (East) Mumbai 400 051, India

Date: [-----date of issue-----]

ADVANCE PAYMENT GUARANTEE No.: [-----guarantee reference number-----]

Guarantor: [-----name and address of place of issue-----]

We have been informed that [-----name of Contractor or name of the joint venture-----]
(hereinafter called "the Applicant") has entered into Contract Agreement No. _____ dated
_____ with the Beneficiary, for the execution of "Design, Manufacture, Supply, Installation,
Testing & Commissioning (Part A) and Comprehensive Maintenance Service (Part B) of
'Automatic Train Wash Plant' (MM3-CBS-DEQ-9-02) for the Mumbai Metro Line 3 Project.

Furthermore, we understand that, according to the conditions of the Contract, an advance payment
in the sum of ----- (amount in words and figures) ----- is to be made against advance payment
guarantee towards Part A of the Contract, viz. Design, Manufacture, Supply, Installation, Testing &
Commissioning of 'Automatic Train Wash Plant' (MM3-CBS-DEQ-9-02) for the Mumbai Metro
Line 3 Project.

We as Guarantor, hereby irrevocably undertake to pay the Beneficiary any sum or sums not
exceeding in total an amount of ----- (amount in words and figures) ----- upon receipt by us of
the Beneficiary's first demand in writing accompanied by a written statement stating that the
Applicant is in breach of its obligation under the Part A of the Contract because the Applicant used
the advance payment for purposes other than toward the execution of the Works.

A demand under this guarantee may be presented as from the presentation to the Guarantor of a
certificate from the Beneficiary's bank stating that the advance payment referred to above has been
credited to the Applicant on its account number _____ at _____ (name and address of
Applicant's bank) _____.

The amount of this guarantee shall be progressively reduced in proportion to the value of each part-
shipment or part-delivery of Plant and Equipment to the site, as indicated in copies of the relevant
shipping and delivery documents that shall be presented to the Guarantor. This guarantee shall
expire, at the latest, upon the Guarantor's receipt of documentation indicating full repayment by the
Applicant of the amount of the advance payment, or on the ___ day of _____, 2___, whichever is
earlier. Consequently, any demand for payment under this guarantee must be received by the
Guarantor at its office on or before that date.

This guarantee is subject to the Uniform Rules for Demand Guarantees, ICC Publication No. 758.

SIGNATURE AND SEAL OF THE GUARANTOR -----

NAME OF BANK -----

ADDRESS -----

DATE -----



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BIDDING DOCUMENTS



MUMBAI METRO LINE 3 (COLABA-BANDRA-SEEPZ)

CONTRACT MM3-CBS-DEQ-9-02

Design, Manufacture, Supply, Installation, Testing, Commissioning
and Comprehensive Maintenance Service of
Automatic Train Wash Plant
for Project "Mumbai Metro Line-3"

Part 3

General Conditions of Contract and Contract Forms

Section X

Special Conditions of Contract
for
Comprehensive Maintenance Service

January - 2020

Mumbai Metro Rail Corporation Ltd
MMRC Line 3 Transit Office,
Wing A, Block E,
Bandra-Kurla Complex,
Bandra (East), Mumbai- 400 051, India.



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Bidding Documents Composition of Documents

Part 1	Bidding Procedure
Section I	Instructions to Bidders
Section II	Bid Data Sheet
Section III	Evaluation and Qualification Criteria
Section IV-A	Bidding Forms
Section IV-B	Pricing Document
Section V	Eligible Source Countries of Japanese ODA Loans
Part 2	Employer's Requirements
Section VI-A	Employer's Requirements – General Specifications
Section VI-B	Employer's Requirements – Technical Specifications
Part 3	Conditions of Contract and Contract Forms
Section VII	General Conditions of Contract (GCC)
Section VIII	Particular Conditions of Contract (PCC)
Section IX	Contract Forms
Section X	Special Conditions of Contract for Comprehensive Maintenance Service
Part 4	Drawings
Section XI	List of Drawings



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TABLE OF CONTENTS

1.	Definitions:	1
2.	Scope of Comprehensive Maintenance Service (CMS):.....	1
3.	Supply of Spares, Consumables, Lubricants and other materials:	2
4.	Maintenance personnel of Contractor:.....	3
5.	Supply of Electricity, Water and Air:	4
6.	Use and care of site:	4
7.	Access Roads and Haul Roads:.....	4
8.	Notice and Instructions:	4
9.	Confidentiality:	5
10.	Employer's Obligations:	5
11.	Operation & Maintenance personnel provided by Employer:	5
12.	Price Adjustment:.....	5
13.	Payments:	5
14.	Penalties:	5
15.	Quantity Variation:	7
16.	Change of Scope:	7
17.	Modifications to the Facilities:	7
18.	Employer's right to take remedial measures:.....	8
19.	Service records:.....	8
20.	Assignment:	8



1. Definitions:

In these Special Contract Conditions (SCC) for Comprehensive Maintenance Service (CMS), unless the context otherwise requires:

- i. "Comprehensive Maintenance Service" means Maintenance Services referred to in the Clause 4, Section VI-B, Part 2, carried out to ensure that the Facilities remain in working order and operate in accordance with its original specification and meet with all operative requirements as specified in Section VI-B, Technical Specifications, Part 2 of the Facilities or as otherwise agreed to between the Employer and the Contractor. CMS also includes provision by the Contractor, at his own cost, of all the items as specified in Technical Specifications, Section VI-B, Part 2 required to carry out CMS work.
- ii. "Consumable spares" mean the spares or components, required on a regular basis, at least once in two years, for effective working of the Plant.
- iii. "Employer" shall also mean its authorised representative, or the Operator appointed by the Employer for operation of MML3 Project.
- iv. "Normal Working Days" means all days of the week other than Sundays and public holidays as notified by the Employer on a regular basis.
- v. "Normal Working Hours" means the period between 9:00 hrs to 18:00 hrs.
- vi. "Original Equipment Manufacturer (OEM)" means the entity that designed, manufactured and installed the Equipment. In this Section, it may be the Contractor and its sub-contractors.
- vii. "Performance Certificate (CMS)" means the Certificate issued by the Employer on satisfactory completion of CMS.
- viii. "Repairs" means the actions needed to restore the defective plant back in good working order or a plant with improper working status back in reasonably good condition with or without replacement of spares. Repairs to the plant upon its breakdown normally come under 'Unscheduled Maintenance'.
- ix. "Service" means periodic attention to a functioning or non-functional plant with a pre-defined set of actions to be taken at different periodicities. This is combined with regular checking of the plant, cleaning, oiling, greasing of movable parts with a view to reduce wear and tear.

2. Scope of Comprehensive Maintenance Service (CMS):

- 2.1 The CMS shall be performed by the Contractor through its authorised maintenance personnel in accordance with Clause 4, Section VI-B, Technical Specifications, Part 2. The Contractor shall be fully accountable for the performance of the Part B of the Contract for CMS of the Equipment under the Contract.
- 2.2 The Contractor shall commence CMS (Part B of the Contract) within 14 days from the date of issue of Operational Acceptance Certificate of the Facilities by the Project Manager.
- 2.3 The Maintenance Services are to be carried out to ensure that the Wash Plant remains in working order and operates in accordance with its original specifications meeting all the operational, reliability, availability and maintainability requirements.
- 2.4 CMS includes, but is not limited to, Periodical Servicing, Preventive Maintenance, Unscheduled Maintenance, Corrective Maintenance, Fault Reporting System and Predictive Maintenance. This involves revalidation of Employer's Operational personnel, associating the Maintenance personnel of Employer in maintenance work, providing Emergency support to Employer during Operational Failures, documentation and all other activities that the Employer would have otherwise carried out as a part of maintenance of the Facilities.



- 2.5 The Contractor shall, unless specifically excluded in the Contract, perform all such work, not specifically mentioned in the Contract but can be reasonably inferred from the Contract as being required for CMS as if such work was expressly mentioned in the Contract.
- 2.6 Where it is necessary to leave the Depot premises with the Equipment out of service for more than two hours (e.g. to obtain replacement parts, etc), this will be duly informed to the Employer's Maintenance Engineer with reasons in writing and recorded in the maintenance Log Books.
- 2.7 The Contractor shall undertake CMS of the Facilities and associated equipment during Normal Working Days and Normal Working Hours unless otherwise permitted by the Project Manager. However, breakdowns affecting washing of the rakes of the Wash Plant may have to be attended to on 24 x 7 basis for which regular co-ordination with the Employer shall be done by the Contractor.
- 2.8 The periodical, preventive and corrective maintenance activities shall be planned with minimum disruption in operations of the Wash Plant for which regular co-ordination with the Employer shall be done by the Contractor.
- 2.9 Upon notifying the Contractor of a fault, maintenance staff of the Contractor shall attend the location within the time specified in Clause 4, Section VI-B and within two hours of attending the location, give an estimate to Project Manager of the time required to undertake the Repairs or advise as to by when the estimate shall be ready to be given. In case more time is required for fault investigation, the maintenance staff shall inform the Project Manager/ Employer of the time required for the purpose.
- 2.10 The Equipment entrusted to Contractor for repair at their workshop shall be at the risk and cost of the Contractor. If any deduction is required to compensate any loss on this account, the same shall be adjusted from balance payments or by means of forfeiting the Performance Security.
- 2.11 During maintenance, the Contractor shall follow all statutory acts, regulation and code practices in force like IE rules and Acts etc. The Contractor shall also ensure implementation of all relevant Safety & Health norms for his maintenance staff.
- 2.12 Failure reporting shall be done by the Employer's Representative on phone, fax, e-mail, SMS, WhatsApp or per bearer or posted at the Contractor's address given for the purpose. The responsibility to keep the failure reporting address & all contact details current will rest with the Contractor.
- 2.13 The CMS performance of the Contractor shall support the targets including the RAM targets given in Clause 2.11, Section VI-B, Part 2 by ensuring that the Facilities are available for the scheduled work output in accordance with the technical requirements set out in Clause 4 of Section VI-B. Accordingly, the maintenance has to be planned in a manner sufficient to carry out the maintenance tasks as required.
- 2.14 The Contractor shall provide the Check Sheets to the Project Manager for his checks.
- 2.15 The Contractor shall make good any damage to the locations, or its services caused by any act or omission of the Contractor in undertaking the services.
- 3. Supply of Spares, Consumables, Lubricants and other materials:**
 - 3.1 The Contractor shall, unless specifically excluded in the Contract, supply all items, specifically mentioned in Clause 4, Technical Specifications, Section VI-B, at his own cost, for CMS work.



- 3.2 The Contractor shall also maintain, at site, all necessary Operation and Maintenance Manuals, documentation, tools and Test Equipment during the CMS period.
- 4. Maintenance personnel of Contractor:**
- 4.1 The Contractor shall, in providing the Services, deploy suitably qualified personnel for CMS. The Contractor should ensure that they have the valid competency certificate issued by the Contractor (OEM).
- 4.2 Competent and trained manpower (as per the requirements) will be deputed as and when required from within India, preferably from Mumbai for the purposes of maintenance of the Facilities.
- 4.3 The manpower (technicians) deployed / to be deployed shall have experience in maintenance of similar Equipment for a minimum of 2 years. If adequately experienced manpower is not available, the manpower deployed/ to be deployed shall have been trained for at least 3 months on maintenance of similar Equipment.
- 4.4 The minimum educational qualifications of the manpower shall be 12th passed or 10th passed with ITI in trades related to Machine Maintenance.
- 4.5 Details of maintenance personnel to be engaged for maintenance work shall be provided to the Employer within 14 days after the issue of Completion Certificate of the Facilities by the Project Manager.
- 4.6 Employer reserves the right to object at any time by notice to the Contractor as to the Maintenance personnel of the Contractor carrying out the Services who Employer finds and considers unsuitable to carry out the Services or are not doing so to the satisfaction of Employer. The Contractor shall have to arrange suitable replacements immediately but in no case by not more than three weeks.
- 4.7 The Contractor shall have to make his own arrangements for boarding & lodging of his staff/ personnel.
- 4.8 It shall be the entire responsibility of the Contractor to adopt all the safety measures & deploy only those personnel during maintenance of the Equipment under CMS, who are adequately trained in safety aspects. The Contractor's maintenance personnel shall wear safety/ protective wear as well as take all safety precautions to fulfil its obligations towards Occupational Health & Safety regulations in India.
- 4.9 If any accident occurs during maintenance due to any reason which cannot be attributed to the Employer, it shall be the responsibility of the Contractor to bear with the expenses and costs arising out of the accident. If in case of negligence on the part of Contractor's personnel, there is loss/ damage to Employer's property, The Employer reserves the right to recover such loss from the bills of Contractor or through any other means.
- 4.10 The Contractor shall notify the Employer of every work-related illness or injury (grievous or fatal in accordance with the provisions of the Factories Act, 1948) which occurs within the Depot premises as soon as possible after such occurrence.
- 4.11 The Contractor shall co-operate with any investigation agency for enquiry into any injury/ fatality to his maintenance personnel within the Depot premises which the Employer deems appropriate.



4.12 The Contractor shall acknowledge that its employees, agents or subcontractors shall not be intoxicated by alcohol or drugs when they are deputed in the Depot premises in connection with CMS of the Equipment or any work related to it.

4.13 The Contractor agrees and acknowledges that the Employer may:

- by either breath or saliva sample, at any time, conduct random tests for alcohol and/or drugs on its personnel, agents or subcontractors who enter Depot premises; and
- exclude from Depot premises any Contractor's personnel, agents or subcontractors who in the opinion of the Employer are not considered conducive to the functioning of Depot.

4.14 The Contractor shall indemnify and keep indemnified the Employer from and against any liability for damages arising out of any unsafe working by the Maintenance personnel of the Contractor.

5. Supply of Electricity, Water and Air:

5.1 The Contractor shall submit details for the requirements of electricity, water and compressed air for CMS work (Part B of the Contract).

5.2 The Contractor shall make his own arrangement to tap the electricity from the nominated sockets/ points. The Contractor shall tap the electricity as per IE Rules & Act (Latest) duly following all safety precautions.

5.3 The Contractor should make his own arrangements to draw the water from the available water point to the working place in such a manner without affecting the cleanliness in the premises.

5.4 The Contractor should make his own arrangements to draw the air from the available source to the working place in such a manner without affecting the safety and cleanliness.

6. Use and care of site:

6.1 The Contractor shall not demolish, remove or alter structures or other facilities on the site without prior approval of the Project Manager.

6.2 All garbage/ debris from any such work shall be removed from site at times and in the manner as directed by the Project Manager.

6.3 All Electrical and Electronic equipment shall be cleaned under the supervision of Contractor's Maintenance Engineer.

6.4 All works shall be carried out without unreasonable noise and disturbance.

7. Access Roads and Haul Roads:

7.1 Right of way to the worksite on the existing roads will be provided to the Contractor to carry out required maintenance activities, with prior approval of the Employer.

7.2 The Contractor shall repair any damage to the road or bear the cost thereof due to the movement of Contractor's Plant and Equipment, vehicles, etc. to the specifications and satisfaction of the Project Manager/ Employer.

8. Notice and Instructions:

8.1 The Contractor shall establish an office in India, preferably in Mumbai, for planning, co-ordination, execution and monitoring the progress of the CMS and intimate its address in writing to the Employer.



8.2 The Contractor shall inform Employer of the mobile, fax and email addresses of the Contractor's Maintenance Engineer and Supervisor and any changes thereto who shall undertake the Services. Any changes in the contact details must be informed to the Employer within 24 hrs of the change.

8.3 Any notice or instructions to be given to the Contractor under the terms of the Contract shall be deemed to have been served on him if it has been delivered to his authorized agent or representative at site, emailed or sent by SMS to the Contractor's nominated personnel or sent by registered post to the Contractor's office, or to the address of the firm last furnished by the Contractor.

9. Confidentiality:

9.1 The Contractor will take or cause to be taken such reasonable precautions as may be necessary to maintain the confidentiality of and to prevent disclosure of the Confidential Information and will limit access to the Confidential Information of those of its personnel performing the Services who sign an undertaking that they will comply with this clause and deliver those undertakings to the Employer on request.

10. Employer's Obligations:

10.1 Employer will cooperate with the Contractor to allow the Contractor sufficient access to undertake Services to the Facilities and associated equipment etc.

10.2 Suitable accommodation shall be provided to Contractor's maintenance staff for them to carry out documentation work during visits for CMS work, as deemed fit by the Employer.

11. Operation & Maintenance personnel provided by Employer:

11.1 Employer's Maintenance Engineer shall co-ordinate with the Contractor's Maintenance Engineer for the CMS of the Facilities.

11.2 Employer's Maintenance Staff, under the administrative and technical control of Employer, if available, shall associate with the Contractor's Maintenance personnel during CMS for their re-training in the maintenance of the Facilities.

12. Price Adjustment:

12.1 The Price for CMS (Post-DLP) as in Schedule 8 (Part B of the Contract) shall be subject to Price Adjustment in accordance with Appendix 2, Section IX, Part 3 of the Contract Agreement.

13. Payments:

13.1 Payments for CMS, Part B of the Contract shall be made on a quarterly basis (calendar quarter) as given in Appendix 1, Section IX, Part 3 of the Contract Conditions and subject to recoveries/ penalties if any.

14. Penalties:

14.1 Penalty for MTBF (refer Clause 4, Section VI-B, Part 2) for everyone (01) day drop from the target shall be levied as ₹2000/-



- 14.2 Penalty for lower Availability (refer clause 2.11, Section VI-B, Part 2) for every one percentage drop shall be levied as under:

S. No	Availability Slab	Applicable Penalty (as % of the annual price of CMS)
1	Below 96% to 85%	0.5%
2	Below 85% to 75%	1% + Amount calculated as in Sr No 1 for availability up to 85%.
3	Below 75%	2% + Amount calculated as in Sr No 1 and 2 for availability up to 75%

- 14.3 Penalty for MTTR (refer clause 2.11, Section VI-B, Part 2) for every one-hour increase from the target shall be ₹3000.
- 14.4 Penalty for non-completion of work or poor quality of work, i.e. improper supervision, and use of inferior quality of materials, etc. will be levied. The penalty imposed shall be ₹10,000/- per instance.
- 14.5 In the event the Contractor fails to repair or rectify any defect or deficiency resulting in the Facilities remaining non-functional for a period exceeding ten (10) days from and including the date of reporting the fault/ defect/ deficiencies

or

in the event the Contractor fails to deploy the competent manpower resulting in the Facilities remaining non-functional for a period exceeding ten (10) days from and including the date of reporting the fault/defect/deficiency,

it shall, unless the Contractor has given valid reasons for the delay in repairs and are accepted by the Employer and also duly conveyed to the Contractor, be deemed a breach of this Contract and the Employer shall be entitled to recover the cost of getting it repaired from other agencies along with a penalty of ₹ 1,00,000/- per instance. This is in addition to the proportional amount to be deducted for non-completion or for not carrying out the work.

The action of the Employer in getting the Facilities repaired from other agencies shall be at the sole risk and cost to the Contractor and no liabilities shall accrue to the Employer subsequent to or during the repairs done by any other agency. The repairs got done from any other agency shall be deemed as if these are carried out by the Contractor himself.

Recovery of such penalty shall be without prejudice to the rights of the Employer under this Agreement, including the right of Termination thereof.

- 14.6 The aggregate amount of such penalties shall in no event exceed the amount of 15% of the quarterly Contract Price (CMS) in any Quarter, subject to a maximum of 10% of the Contract Price (Part B) over the complete year. Once the total penalty imposed during the Contract period for CMS is reached at 10% of the Contract Price (Part B) level and the Equipment is still found defective, the Employer may consider termination of the Part B of the Contract with forfeiture of the Performance Guarantee available with the Employer.



14.7 The penalties as above shall not relieve the Contractor from his obligation to execute the works or from any other of his obligations and liabilities under the contract including his obligations for the systems and software procured by the Contractor for the Facilities.

15. Quantity Variation:

15.1 The Employer may exercise the option of quantity variation by decrease/ increase of CMS period up to the extent of 2 years within the contracted duration at the same terms and conditions of payment. Notice for any variation in CMS period, if availed, shall be given at least 3 months before the completion of CMS period.

15.2 In case the Contractor and Employer are willing to enter into fresh CMS contract after expiry of the extended period of Contract as per sub-clause 15.1, the Employer and Contractor shall commence proceedings relating to the placement of fresh contract of the CMS for a further period up to five (5) years with new terms and conditions for the new contract, at least six (6) months prior to the anticipated completion of CMS.

15.3 If the Contractor and Employer are unable to mutually agree upon the placement of fresh contract for CMS as per sub-clause 15.2 and no decision to place the fresh contract is communicated to the Contractor by the Employer thirty (30) days prior to the anticipated Completion of CMS, then this Contract shall stand completed on the issue of Performance Certificate (CMS).

16. Change of Scope:

16.1 The Employer may, notwithstanding anything to the contrary contained in this Contract, require the provision of additional works and services in the Contract, which is not included in the scope of Work in Part B of the Contract.

16.2 Upon receipt of detailed proposal from the Employer, the Contractor shall give an estimate of the additional work proposed and the time required for carrying out the work. The estimate shall be reviewed by the Employer and upon reaching an agreement, the Employer shall issue an order (the "Change of Scope Order") requiring for the Contractor to proceed with the performance thereof.

16.3 For any such Change of Scope which is approved by the Employer, the Contractor shall carry out the modifications/ upgradations and the agreed costs incurred by the Contractor shall be, reimbursed to it by the Employer.

16.4 Payment for Change of Scope:

The Contractor shall, after completion of work, present to the Employer bills for payment in respect of the work and services completed, supported by such documentation as is reasonably sufficient for the Employer to determine the accuracy thereof. Within 42 (forty-two) days of receipt of such bills, the Employer shall disburse to the Contractor such amounts as are reasonable.

17. Modifications to the Facilities:

17.1 The Contractor shall not carry out any material modifications to the Facilities except where such modifications are necessary for the Facilities to operate in conformity with the Specifications and Standards, Maintenance Obligations, Good Industry Practice and Applicable Laws, provided that the Contractor shall notify the Employer of the proposed modifications along with particulars and shall reasonably consider any suggestions that the Employer may make before commencing work on such modifications.



18. Employer's right to take remedial measures:

18.1 In the event the Contractor does not maintain and/or repair the Facilities in conformity with the provisions of the Contract and the Maintenance Manual, and fails to commence remedial works (due to the causes not attributable to the Employer) within 14 (fourteen) days or any other smaller period as advised to the Contractor, of receipt of a notice in this regard from the Employer, the Employer shall, without prejudice to its rights under this Agreement, including Termination of the Contract and forfeiture of the balance PBG, be entitled to undertake such remedial measures at the risk and cost of the Contractor, and to recover its cost from the Contractor. In addition to recovery of the aforesaid cost, sum equal to 25% (twenty-five per cent) of such cost shall be deducted from the dues of the Contractor as Damages.

19. Service records:

19.1 Employer may, at any time, undertake a full audit of the Services provided by the Contractor. The Contractor shall render all reasonable assistance to Employer in undertaking such audit.

20. Assignment:

20.1 This Agreement may be completely assigned by the Employer to any operator or other entity elected/ appointed so by the Employer at its sole discretion.

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BIDDING DOCUMENTS



MUMBAI METRO LINE 3 (COLABA-BANDRA-SEEPZ)

CONTRACT MM3-CBS-DEQ-9-02

Design, Manufacture, Supply, Installation, Testing, Commissioning
and Comprehensive Maintenance Service of
Automatic Train Wash Plant
for Project "Mumbai Metro Line-3"

PART 4 DRAWINGS

Section XI- Drawings

January - 2020

**Mumbai Metro Rail Corporation Ltd
MMRC Line 3 Transit Office,
Wing 'A', 'E' Block,
Bandra-Kurla Complex,
Bandra (East), Mumbai 400 051, India**



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Bidding Documents Composition of Documents

PART 1	Bidding Procedure
Section I	Instructions to Bidders
Section II	Bid Data Sheet
Section III	Evaluation and Qualification Criteria
Section IV-A	Bidding Forms
Section IV-B	Pricing Document
Section V	Eligible Source Countries of Japanese ODA Loans
PART 2	Employer's Requirements
Section VI-A	Employer's Requirements – General Specifications
Section VI-B	Employer's Requirements – Technical Specifications
PART 3	Conditions of Contract and Contract Forms
Section VII	General Conditions of Contract (GCC)
Section VIII	Particular Conditions of contract (PCC)
Section IX	Contract Forms
Section X	Special Conditions for Comprehensive Maintenance Service
PART 4	Drawings
Section XI	Drawings



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BIDDING DOCUMENTS



MUMBAI METRO LINE 3 (COLABA-BANDRA-SEEPZ)

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Design, Manufacture, Supply, Installation, Testing, Commissioning
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Automatic Train Wash Plant
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Part 4 Drawings

Section XI Drawings

January - 2020

**Mumbai Metro Rail Corporation Ltd
MMRC Line 3 Transit Office,
Wing A, Block E,
Bandra-Kurla Complex,
Bandra (East), Mumbai- 400 051, India.**



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Part 4	Drawings
Section XI	Drawings



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List of Drawings

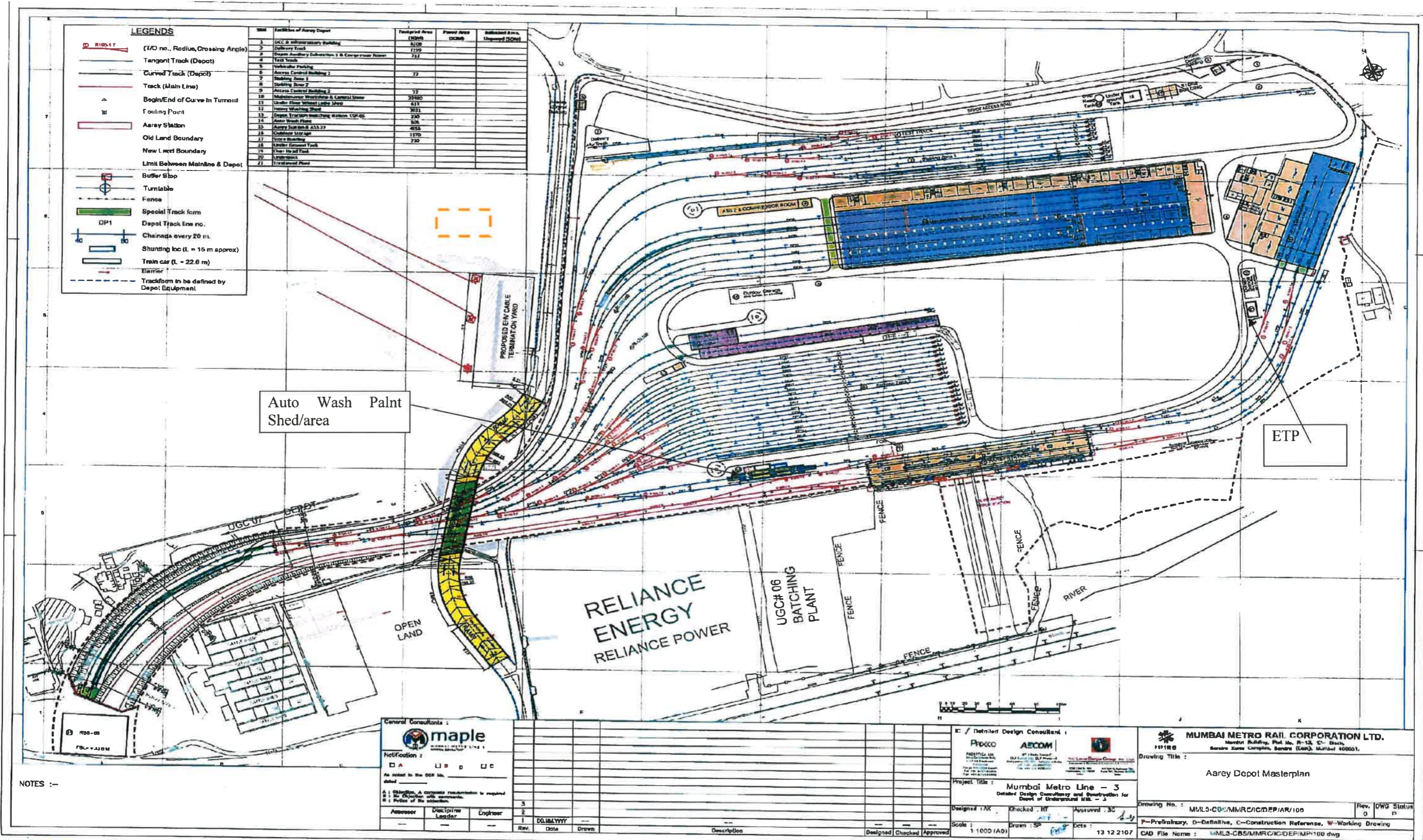
Drg.No.	Drawing No.	Drawing Title
1	MML3-CBS/MMRC/IC/DEP/AR/106	Aarey Depot Masterplan
2	MML3-GC-SOD-GD-0161001	Kinematic Envelope
3	DEPOT-ARP-D09-0001	Wash Plant Civil Work
4	DEPOT-ARP-D09-0001-1	Washing Pad
5	DEPOT-ARP-D09-0002	Wash Plant Control Room
6	DEPOT-ARP-D09-0005	Under Ground Tanks



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Aarey Depot Masterplan

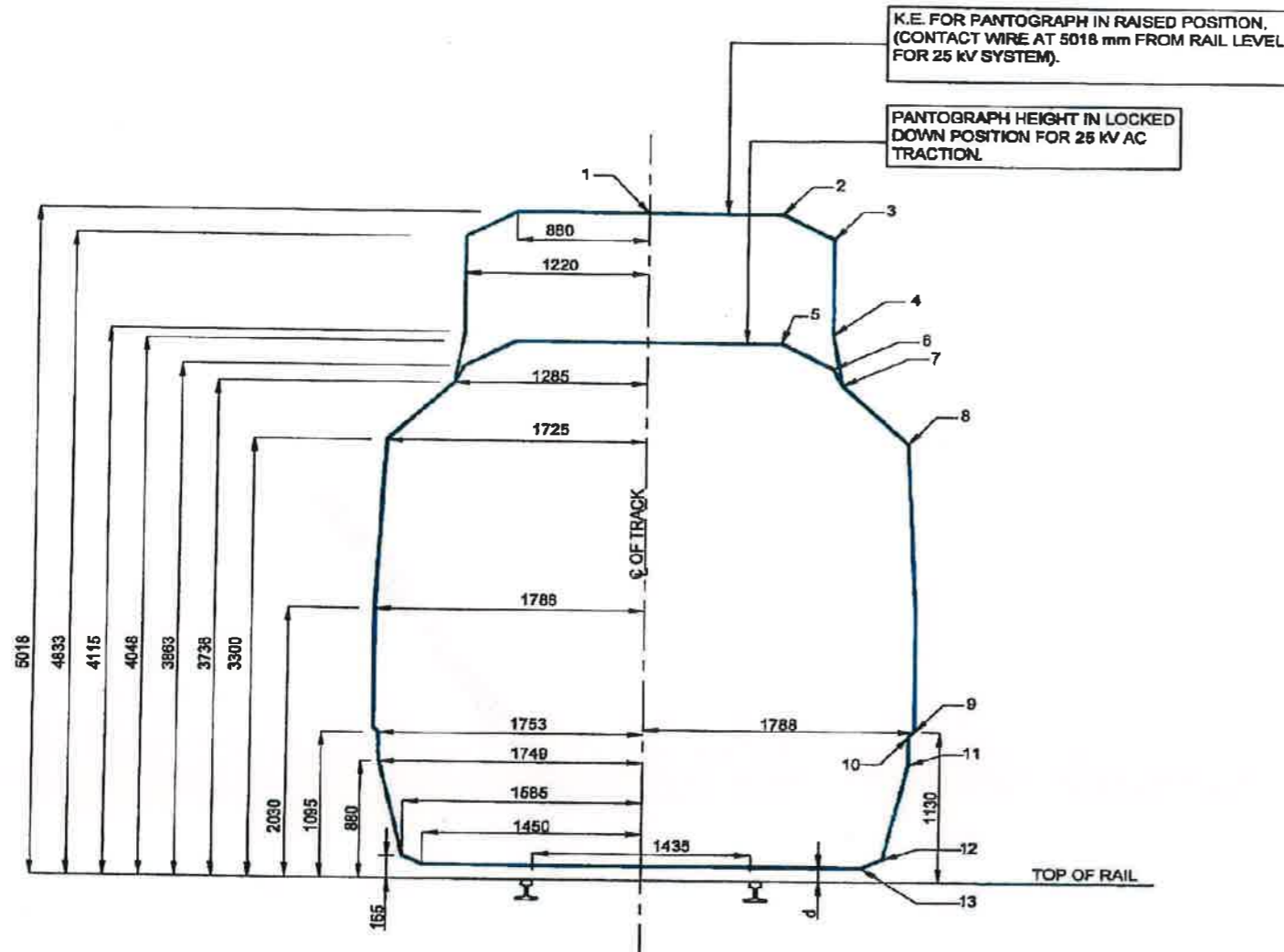


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Kinematic Envelope

MMRC-1



CO-ORDINATES OF K.E		
	X	Y
1	0	5018
2	880	5018
3	1220	4833
4	1220	4115
5	880	4048
6	1220	3863
7	1285	3736
8	1725	3300
9	1788	1130
10	1753	1095
11	1749	880
12	1585	165
13	1450	d

NOTES :

1. ALL DIMENSION ARE IN mm UNLESS OTHERWISE STATED.
2. HORIZONTAL CLEARANCE DUE TO CURVES SHALL BE ADDED IF PLATFORM IN CURVE.
3. THE KINEMATIC ENVELOPE IS VALID FOR VEHICLES WITH SEALED WINDOWS AND DOORS CLOSED WHILE IN MOTION.
4. CONDUCTOR HEIGHT ABOVE RAIL LEVEL SHALL ALSO TAKE INTO CONSIDERATION PRESCRIBED ELECTRICAL CLEARANCES BETWEEN ALL LIVE OVERHEAD EQUIPMENT AND PANTOGRAPH / VEHICLE AND PARTS THEREOF.
5. A TYRE OR AN ATTACHMENT OF A WHEEL MAY PROJECT BELOW THE MINIMUM HEIGHT IS OF KINEMATIC ENVELOPE FOR DISTANCE OF 51 mm INSIDE AND 216 mm OUT SIDE THE WHEEL GAUGE FACE.
6. DIMENSION 'd' SHALL BE 75 mm (MINIMUM) FOR BOGIE MOUNTED EQUIPMENT FOR FULLY LOADED STATIC VEHICLE AND 102 mm (MINIMUM) IN FULLY LOADED CONDITION FOR BODY MOUNTED EQUIPMENT EXCEPT AS LAID DOWN AT ITEM 6 ABOVE, AND 50mm UNDER DYNAMIC CONDITION. REFERENCE : SOD PARA 1.5 AND SOD PARA 3.1.3 (II)
7. KINEMATIC ENVELOPE IS VALID FOR SPEED UPTO 85KMPH DESIGN SPEED AND UPTO 85KMPH OPERATING SPEED MAXIMUM

FIG. MMRC-1
Ref. SOD Para 1.5 (a) & 3.1.3 (II)



GENERAL CONSULTANCY SERVICES
FOR MUMBAI METRO RAIL PROJECT, LINE 3
COLABA- BANDRA-SEEPZ

REV.	DATE	PREP.	APPR.	DESCRIPTION	APPROVED BY	NAME	SIGN	DATE	PROJECT	DRAWING TITLE	DRAWING NO
C	16-01-2018	NRV	RJM	COMMENT RDSO 06.12.17 INCORPORATED	FOR RB	NRV	[Signature]	16-01-2018	MUMBAI METRO LINE 3 COLABA-BANDRA-SEEPZ	KINEMATIC ENVELOPE: AT - GRADE AND ELEVATED SECTION ON LEVEL OR CONSTANT GRADE TANGENT TRACK	MM3-GC-SOD-GD-0161001
B	02-06-2017	HRM	RJM	COMMENT RDSO 23.05.17 INCORPORATED		HRM	[Signature]				
A	11-01-2017	KCB	RJM	FIRST ISSUE		KCB	[Signature]				

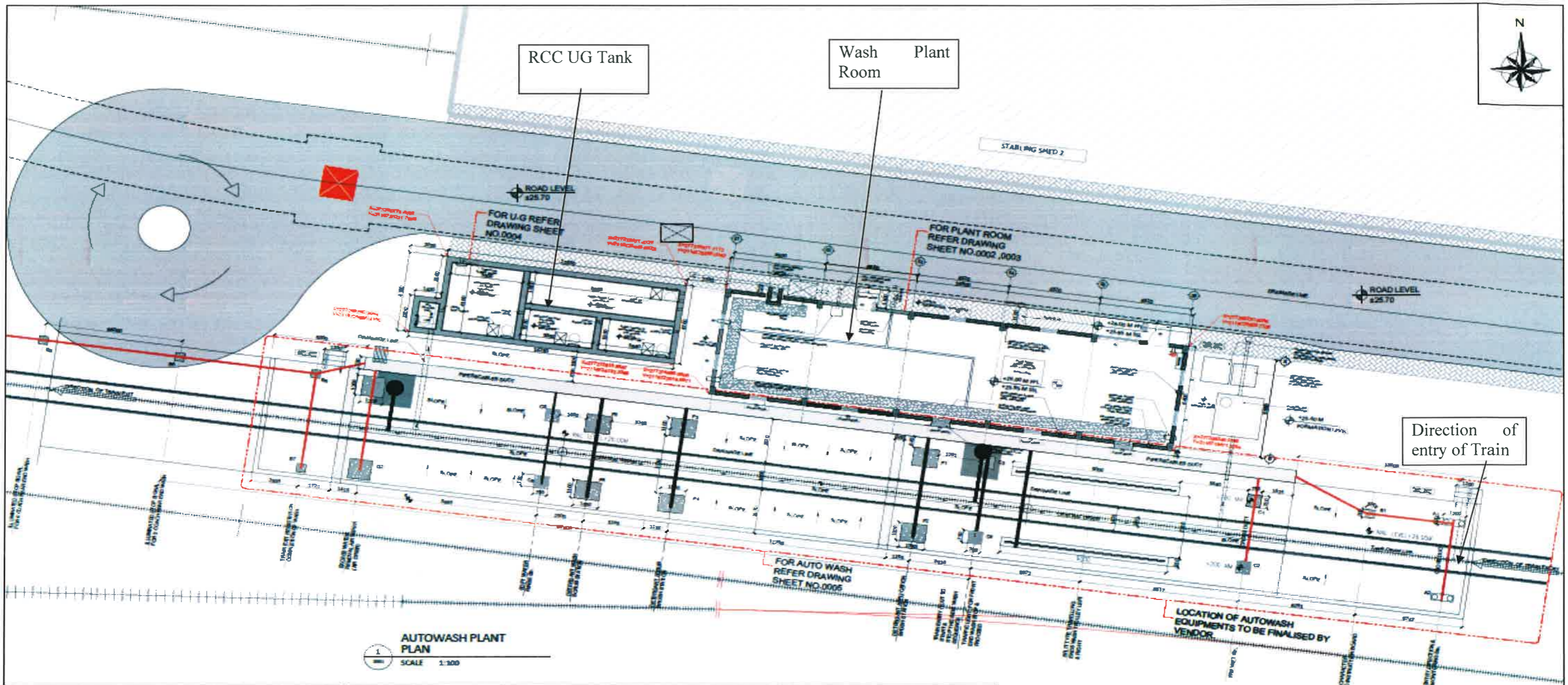
PRINTED ON 02-JUN-17



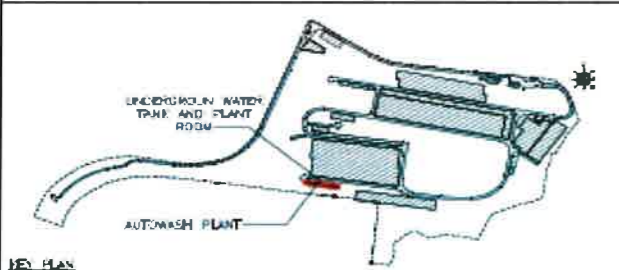
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Auto Wash Plant Shed



1
AUTOWASH PLANT PLAN
SCALE 1:300



LEVEL DATA							LEVEL DATA	
NO.	TYPE	LEVEL	DESCRIPTION	DATE	BY	CHKD.	NO.	DESCRIPTION
01	FIN	425.70	ROAD LEVEL				01	FIN
02	UG	425.70	UNDERGROUND WATER TANK				02	UG
03	UG	425.70	UNDERGROUND WATER TANK				03	UG
04	UG	425.70	UNDERGROUND WATER TANK				04	UG

- NOTES:-**
- All levels of sleeve, pipes are vendor driven
 - The level differences to maintain end of sleeves & pipes is vendor driven
 - The direction of flow of all pipes is vendor driven
 - location, distance, levels of sleeves, pipes, cables, tanks are tentatively shown. any missing links (pipes, distance) are vendor driven
- GRAPHIC SCALE 1:1000

REFERENCE DRAWINGS :-

- REFER DWG NO (DEPOT-APP-009-0002,3) FOR PLANT ROOM PLAN,SECTION AND ELEVATION RESPECTIVELY
- REFER DWG NO (DEPOT-APP-009-0004) FOR UNDER GROUND WATER TANK
- REFER DWG NO (DEPOT-APP-009-0005) FOR AUTO WASH

NOTES:-

- CONTRACTOR TO OBTAIN PERMITS & APPROVALS IN CASE OF ANY DISCREPANCY BEFORE COMMENCEMENT
- ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SPECIFIED
- ALL DIMENSIONS ARE FROM UNFINISHED SURFACE UNLESS OTHERWISE SPECIFIED
- CONTRACTOR TO BE RESPONSIBLE FOR OBTAINING ALL NECESSARY APPROVALS AND TO BE FOLLOWED
- CONTRACTOR MUST BE RESPONSIBLE FOR CONSULTATION WITH STRUCTURAL ENGINEER
- THE LEVEL OF ALL THE STRUCTURAL MEMBERS TO BE INDICATED FROM DRAWINGS OF STRUCTURAL ENGINEER
- ALL UNDER GROUND EQUIPMENTS ARE WITH REFERENCE TO UGWL
- THE LEVELS SPECIFIED IN ALL THE DRAWINGS ARE WORKING FLOOR LEVEL UNLESS OTHERWISE SPECIFIED

Rev	Date	Drawn	Description	Designed	Checked	Approved
A	14.05.2019	RD	DRAWING REVIEW AS PER COMMENTS	SS	AK	PK
B	05.02.2019	RD	CORRECTING DRAWING ERROR	AK	KT	SS
C	07.01.2019	RD	CONTRACTOR DRAWINGS REVIEW	AK	KT	SS
D	05.01.2019	RD	DEFINITE DRAWING ISSUE, COMMENTS ON DESK ADDRESS	AK	KT	SS
A	03.10.2018	RD	COMMENTS ON DESK ADDRESS	AK	KT	SS
R1	27.08.2018	RD	COMMENTS ON DESK ADDRESS	AK	KT	SS

Client / Detailed Design Consultant:

PRIDECO **ASCOM**

Project Title: Mumbai Metro Line - 3

Scale: 1:150 (A1)

Sheet No: 1/15

Date: 14/08/2019

MUMBAI METRO RAIL CORPORATION LTD.
Mumbai Metro Complex, Mumbai (India), Mumbai 400001

Drawing Title: MUMBAI METRO LINE-III AAREY DEPOT

AUTOWASH PLANT SITE PLAN

Sheet No: DEPOT-APP-009-0005

Scale: 1:300 (A1)

Date: 14/08/2019

Author: A

Checked: W

Approved: W

Scale File Name: DEPOT-APP-009-0005.DWG



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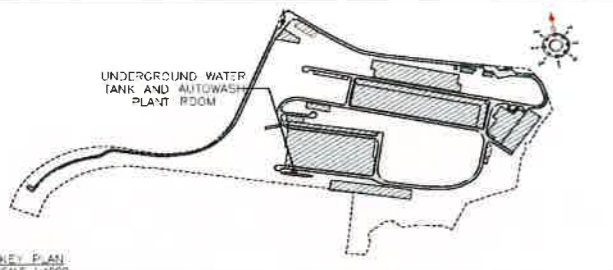
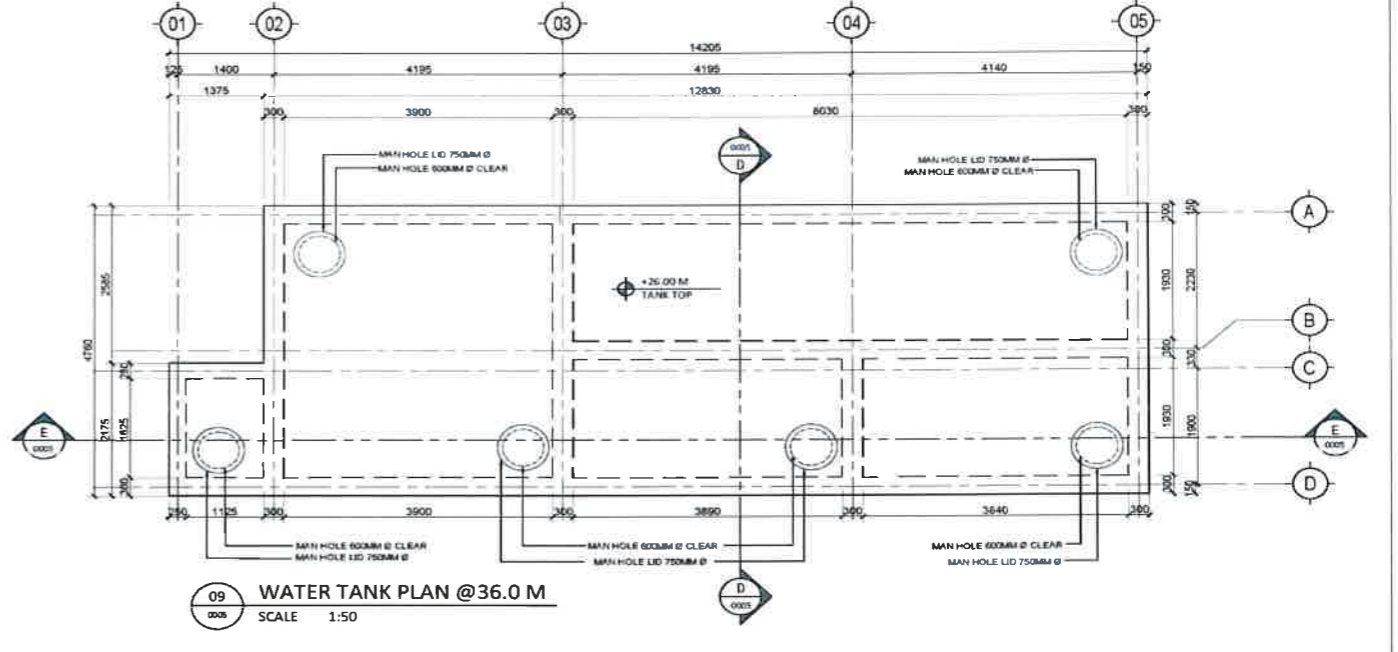
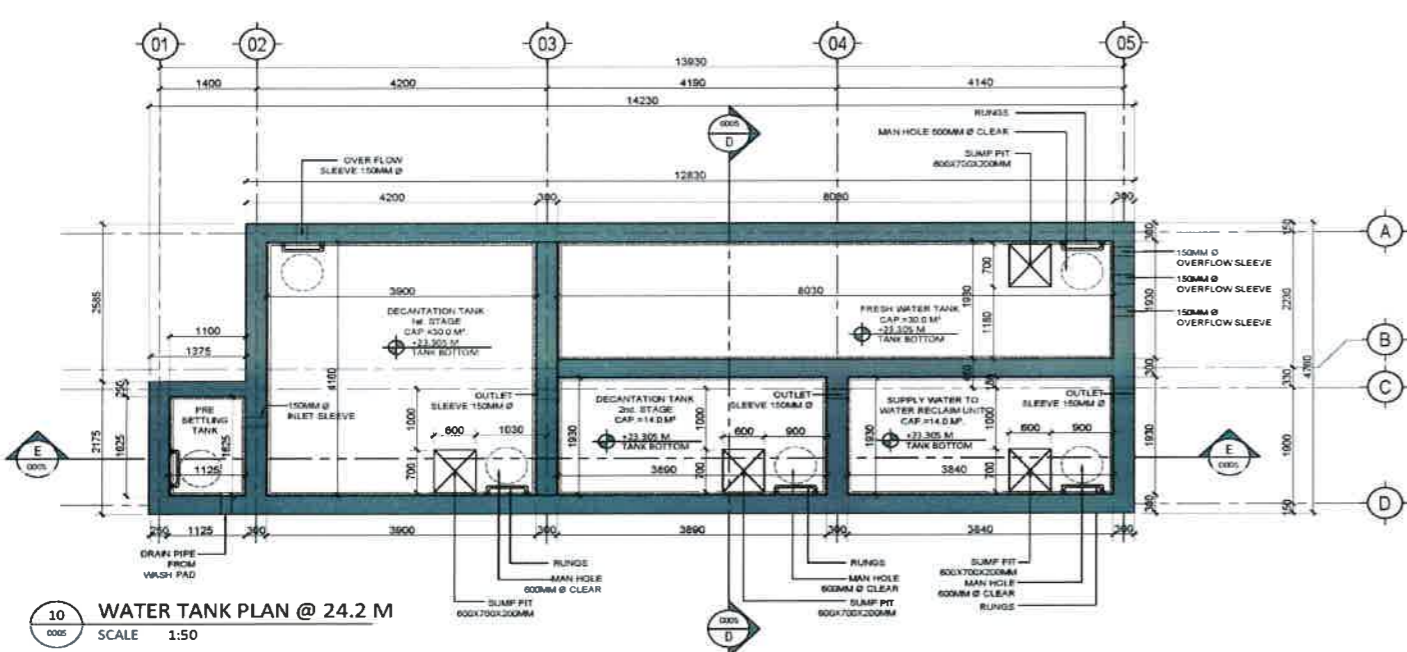
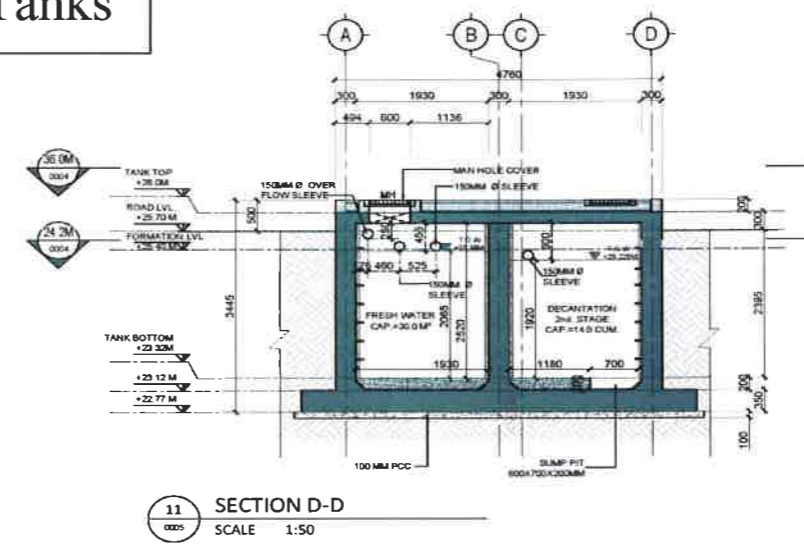
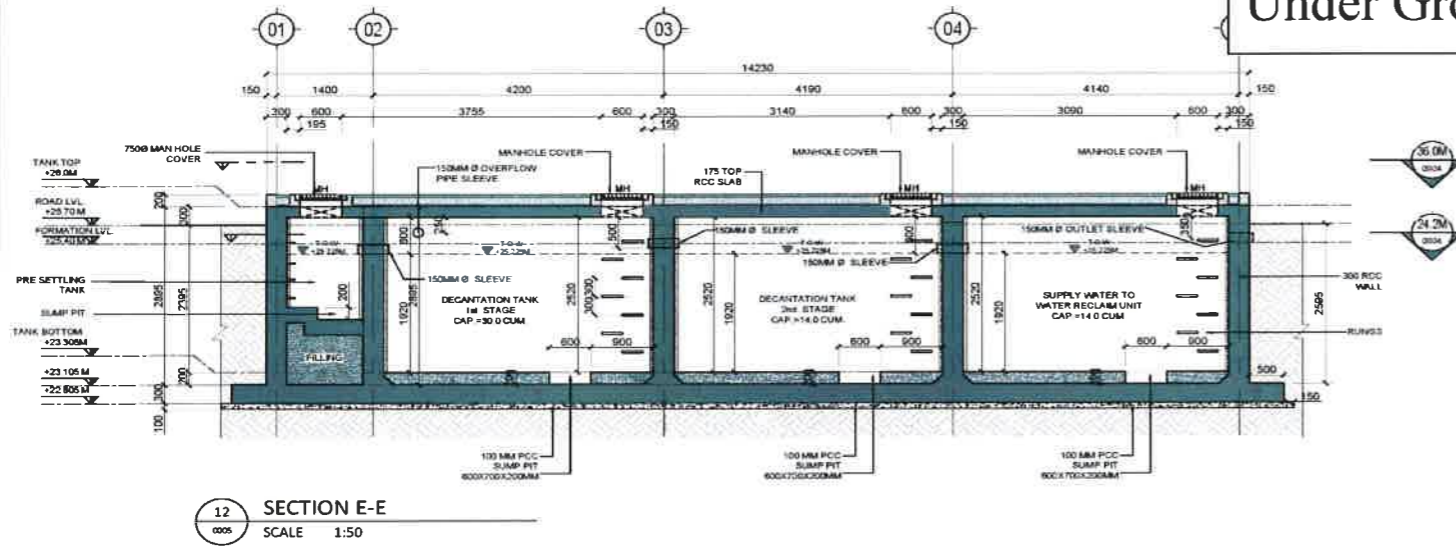
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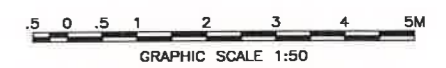
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Under Ground Tanks



- NOTES:-**
- All levels of sleeve, pipes are vendor driven or as/site chief Engineer
 - The level differences to maintain between end of sleeves & pipes is vendor driven
 - The direction of flow of all pipes is vendor driven
 - Location, distance, levels of sleeves, pipes, tanks are tentatively shown. any missing links (pipes, distance) are vendor driven
 - All inlets & outlets to be as per co-ordination with CSD.
 - All levels of pipes to be considered @ Bottom Invert of Pipe in order to caste in through center of RCC Plinth Beam.



REFERENCE DRAWINGS :- AAREY DEPOT MASTER PLAN - (DEPCT-AAA-DOC-0001)
BLOCKWORK DRAWINGS - (DEPOT-AAA-D09-0006-0008)
STRUCTURE DRAWING - VMI 3-MMRC-DEP-TR-141-R02

NOTES:-

- CONTRACTOR TO STUDY DRAWING & REVERT BACK IN CASE OF ANY DISCREPANCIES BEFORE EXECUTION
- ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SPECIFIED
- ALL DIMENSIONS ARE FROM UNFINISHED TO UNFINISHED SURFACES UNLESS OTHERWISE SPECIFIED
- DRAWING NOT TO BE SCALED. ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED
- DRAWING MUST BE READ IN CONJUNCTION WITH STRUCTURAL DRAWINGS
- THE SIZES OF ALL THE STRUCTURAL MEMBERS TO BE REFERRED FROM DRAWINGS OF STRUCTURAL CONSULTANT
- ALL CENTER LINE DIMENSIONS ARE WITH REFERENCE TO (C/C)
- THE LEVELS SPECIFIED IN ALL THE DRAWINGS ARE FINISHED FLOOR LEVELS UNLESS OTHERWISE SPECIFIED

General Consultants		IC / Detailed Design Consultant																																				
 MUMBAI METRO RAIL CORPORATION GENERAL CONSULTANT		 Prideco MUMBAI METRO RAIL CORPORATION DETAILED DESIGN CONSULTANT																																				
Rectification <input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C As noted in the DSP No. _____ dated ____/____/____		Project Title Mumbai Metro Line - 3 Detailed Design (Availability and Construction) for Depot of Underground SII - 3																																				
Assessor _____ Discipline Leader	Engineer _____ Discipline Leader	<table border="1"> <thead> <tr> <th>Rev.</th> <th>Date</th> <th>Drawn</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>C</td> <td>16.09.2019</td> <td>SB</td> <td>WORKING DRAWING REVISED AS PER COMMENTS</td> </tr> <tr> <td>B</td> <td>13.05.2019</td> <td>RD</td> <td>WORKING DRAWING REVISED AS PER COMMENTS</td> </tr> <tr> <td>A</td> <td>14.05.2019</td> <td>RD</td> <td>DRAWING REVISED AS PER COMMENTS</td> </tr> <tr> <td>RO</td> <td>05.02.2019</td> <td>RD</td> <td>WORKING DRAWINGS ISSUED</td> </tr> </tbody> </table>	Rev.	Date	Drawn	Description	C	16.09.2019	SB	WORKING DRAWING REVISED AS PER COMMENTS	B	13.05.2019	RD	WORKING DRAWING REVISED AS PER COMMENTS	A	14.05.2019	RD	DRAWING REVISED AS PER COMMENTS	RO	05.02.2019	RD	WORKING DRAWINGS ISSUED	<table border="1"> <thead> <tr> <th>Designated</th> <th>Checked</th> <th>Approved</th> </tr> </thead> <tbody> <tr> <td>MV</td> <td>SS</td> <td>PK</td> </tr> <tr> <td>SS</td> <td>SS</td> <td>PK</td> </tr> <tr> <td>SS</td> <td>SS</td> <td>PK</td> </tr> <tr> <td>SS</td> <td>SS</td> <td>PK</td> </tr> </tbody> </table>	Designated	Checked	Approved	MV	SS	PK	SS	SS	PK	SS	SS	PK	SS	SS	PK
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 MUMBAI METRO RAIL CORPORATION LTD. Namthi Building, Plot No. P-13, 4 th Block, Bandra Kurla Complex, Bandra (East), Mumbai 400051.	
Drawing Title MUMBAI METRO LINE-III AAREY DEPOT AUTOWASH PLANT WATER TANK PLAN & SECTION	
Drawing No. DEPOT-ARP-D09-0005	Rev C
P-Primary, U-Under Inv., C-Construction Reference, W-Working Drawing	
CAD File Name DEPOT-ARP-D09-0005.dwg	



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