

MAHARASHTRA METRO RAIL CORPORATION LIMITED

(Jointly owned company of Government of India and Government of Maharashtra)

Corrigendum – 4

Tender No. N2-059/AFC-03/2025, Dated 03.07.2025

Name of Work:

Design, Supply, Installation, Testing and Commissioning of open loop EMV NCMC card and QR based Automatic Fare Collection (AFC) system along with CAMC for Nagpur Metro Rail Project Phase-II.

Sr. No.	Clause No	Existing clause	Revised clause
1.	Part-1: Bidding Procedure Section-III: Evaluation & Qualification Criteria 1. Clause 3.1(b), 3.1(c),3.1(d) & 3.2 2. Clause 4.1(b) 3. Note: SI.No:-1 to 12	1. Clause 3.1(b), 3.1(c),3.1(d) & 3.2 2. Clause 4.1(b) 3. Note: SI.No:-1 to 12.	Refer Appendix -1 of corrigendum-4
2.	Part-1: Bidding Procedure Section-IV: Bidding Forms 1. Form No-16 2. Form No-17 3. Form No-19 4. Form No-38 5. Form No-39	1. Form No.-16: Financial Situation and Performance of Bidder 2. Form No-17: Average Annual Turnover 3. Form No-19: Current Contract Commitments / Works in Progress. 4. Form No.-38: Performa for List of Spares for 10 Years of system operation from the last date of Taking over of whole works. 5. Form No. -39: (On Bidder's Letter Head) Undertaking for List of Spares for 10 Years of system operation from the last date of Taking over of whole works.	Refer Appendix -1 of corrigendum-4



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Sr. No.	Clause No	Existing clause	Revised clause																								
3.	Part 2: Works Requirements Section VII-B: Particular Specifications. Clause 1.1 Corridor Description:	<p>Clause 1.1 Corridor Description: Nagpur Metro Rail Project Phase-II consists of the following corridors:</p> <table><thead><tr><th>Section</th><th>System Readiness in all respects required by (expected RoD/ CoD)</th><th>Number of Stations</th></tr></thead><tbody><tr><td>Corridor – 1A Eco Park (At Grade) to Metro City Station</td><td>Nov-25</td><td>2</td></tr><tr><td>Corridor – 1B Acharya Babu Road to Metro City Station</td><td>Oct-27</td><td>4</td></tr><tr><td>Corridor – 2A Pith Road to Laksha Nagar (Elevated)</td><td>Jun-26</td><td>6</td></tr><tr><td>Corridor – 2B Cantonment to Kanhan River (Elevated)</td><td>Jun-27</td><td>6</td></tr><tr><td>Corridor – 3A Pith Road to Vihar to Hingna (Elevated)</td><td>Mar-27</td><td>7</td></tr><tr><td>Corridor – 4A Pith Road to Transport Nagar (Elevated)</td><td>Dec-28</td><td>3</td></tr><tr><td>Total</td><td></td><td>32</td></tr></tbody></table>	Section	System Readiness in all respects required by (expected RoD/ CoD)	Number of Stations	Corridor – 1A Eco Park (At Grade) to Metro City Station	Nov-25	2	Corridor – 1B Acharya Babu Road to Metro City Station	Oct-27	4	Corridor – 2A Pith Road to Laksha Nagar (Elevated)	Jun-26	6	Corridor – 2B Cantonment to Kanhan River (Elevated)	Jun-27	6	Corridor – 3A Pith Road to Vihar to Hingna (Elevated)	Mar-27	7	Corridor – 4A Pith Road to Transport Nagar (Elevated)	Dec-28	3	Total		32	Refer Appendix -2 of corrigendum-4.
Section	System Readiness in all respects required by (expected RoD/ CoD)	Number of Stations																									
Corridor – 1A Eco Park (At Grade) to Metro City Station	Nov-25	2																									
Corridor – 1B Acharya Babu Road to Metro City Station	Oct-27	4																									
Corridor – 2A Pith Road to Laksha Nagar (Elevated)	Jun-26	6																									
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Corridor – 3A Pith Road to Vihar to Hingna (Elevated)	Mar-27	7																									
Corridor – 4A Pith Road to Transport Nagar (Elevated)	Dec-28	3																									
Total		32																									
4.	Part 2: Works Requirements Section VII-B: Particular Specifications. Clause 2.1.5, 3.1.2.7 & 3.1.2.8 & 4.9.2.1 Point (v)	<p>2.1.5 Maha-Metro is implementing AFC System for Phase-II with Central AFC Backoffice System having expansion capacity for 512 stations.</p> <p>3.1.2.7 Central Computer System (CCS): CCS Shall be capable of connecting to 512 stations and shall be capable of processing minimum fifty lac (50,00,000) transactions per day and scalable up-to one hundred and fifty lac (150,00,000) per day.</p> <p>3.1.2.8 Central AFC Backoffice System: Central AFC Backoffice System Shall be capable of connecting to 512 stations and shall be capable of processing minimum fifty lac (50,00,000) transactions per day and scalable up-to one hundred and fifty lac (150,00,000) per day.</p> <p>4.9.2.1 (v) The Central AFC Backoffice System shall be designed to manage up to 512 stations. The addition of new equipment, stations and</p>	<p>2.1.5 Maha-Metro is implementing AFC System for Phase-II with Central AFC Backoffice System having expansion capacity for 150 stations.</p> <p>3.1.2.7 Central Computer System (CCS): CCS Shall be capable of connecting to 150 stations and shall be capable of processing minimum fifty lac (50,00,000) transactions per day and scalable up-to one hundred lac (100,00,000) per day.</p> <p>3.1.2.8 Central AFC Backoffice System: Central AFC Backoffice System Shall be capable of connecting to 150 stations and shall be capable of processing minimum fifty lac (50,00,000) transactions per day and scalable up-to one hundred lac (100,00,000) per day.</p> <p>4.9.2.1 (v) The Central AFC Backoffice System shall be designed to manage up to 150 stations. The addition of new equipment, stations and Central AFC Backoffice System shall be achieved by changing parameters or</p>																								



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		Central AFC Backoffice System shall be achieved by changing parameters or configuration data. No software modifications or additional licenses shall be required.	configuration data. No software modifications or additional licenses shall be required.
5.	Part 2: Works Requirements Section VII-B: Particular Specifications. Clause 4.15	Clause 4.15	Please refer corrigendum-4 Appendix -3: Phase -1- BOQ (added)
6.	Part 2: Works Requirements Section VII-B: Particular Specifications & Section VII-A: General Specifications	1. Appendix – C – Minimum BOQ. 2. Appendix – D – List of Spares, Consumable & Special tools, Testing & Measuring Instruments 3. Appendix – F – Indicative Specifications of Servers & Workstations: H : Indicative Technical Specification of Station Computer System (SCS).	Please refer Appendix -4 of corrigendum-4 which includes following: A. Revised Appendices: 1. Appendix – C – Minimum BOQ. 2. Appendix – D – List of Spares, Consumable & Special tools, Testing & Measuring Instruments 3. Appendix – F – Indicative Specifications of Servers & Workstations: H: Indicative Technical Specification of Station Computer System (SCS). B. New Clause: Ticket Vending Machines (TVM).
7.	Part 2: Works Requirements, Section VII-A: General Specifications Appendix:5	Appendix:5 Site Mobility and Site Office for Employer	Please refer Annexure-1 of corrigendum-4 for Revised Appendix: 5 (Revised) Site Mobility and Site Office for Employer



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Sr. No.	Clause No	Existing clause	Revised clause
8.	Part 3, Section IX: Particular Conditions of Contract (PCC), Particular Conditions Part B – Special Provisions Clause 20.2 Claims for Payment and/or EOT	<p>The first paragraph is replaced with: “If either Party considers that it is entitled to claim under Sub- Clause 20.1 (a) or (b), the following claim procedure shall apply.”</p> <p>Addition to clause:</p> <p>If contractor is entitled for cost compensation on account of delay in the project under any sub-clause of contract, same will be reimbursed on the basis of actual proof of supporting documents.</p> <p>The reimbursement will be restricted to actual project site expenses only like rental charges for site office/store etc., hired equipment/vehicle charges, site staff cost, electricity charges, hired labour/Sub-contractor labour charges. Apart from these expenses towards extension of insurances & performance guarantee will be also be admissible. Overall management, Supervision charges, overheads per year at the rate of 2% of value of balance work of the contract to be completed in extended period will be considered to cater for overhead charges in extended period. However, for the entire extension period till completion of the contract, the cumulative management / Supervision charges will not exceed 5 % of the original contract value (Eq. INR)</p>	<p>The first paragraph is replaced with: If either party considers that it is entitled to claim under Sub clause 20.1: (a) or (b), the following procedure shall apply</p> <p>Addition to clause:</p> <p>If contractor is entitled for cost compensation on account of delay in the project under any sub-clause of contract, same will be reimbursed on the basis of actual proof of supporting documents related to the resources/ commitments that contractor purchased/deployed during the delayed period.</p> <p>Methodology is as under:</p> <p>1.EOT may be granted due to delays not attributable to the contractor after detailed delay analysis report.</p> <p>2. The contractor needs to submit a comparison statement incorporating quality and quantum of manpower, machineries and other resources which would have been required to complete the work within original key dates vs quality and quantum of manpower, machineries and other resources actually deployed by the contractor during the contract duration along with its the financial impact.</p> <p>3. Cost already compensated to the contractor under variations or any other contractual provisions is to be</p>



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Sr. No.	Clause No	Existing clause	Revised clause
			<p>deducted from the EOT compensation claim to avoid duplicity.</p> <p>4. Under the EOT Compensation claim, only those costs which should have been incurred applying prudent practice are to be considered. Unreasonable expenses are to be excluded.</p> <p>5. Following cost shall be reimbursed under EOT claim</p> <p>a. 5% Head Office Project Management Charges of unexecuted value of contracts or Staff Salaries (as certified by a Statutory Auditor/Chartered Accountant, subject to case-specific applicability).</p> <p>b. Site Office Expenses (office rental, electricity, security, storage, transport, etc.), Site project office including sub-contractor staff deployed at actual.</p> <p>c. Equipment Hiring (if applicable) All reimbursed on actuals upon submission of POs, invoices, and payment proofs.</p> <p>d. Bank Guarantee (BG) extensions.</p> <p>e. Insurance premiums.</p> <p>6. However, for the entire extension period till completion of the contract, the cumulative Project Management/Supervision charges will not exceed 5 % of the original contract value (Eq. INR).</p>

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Sr. No.	Clause No	Existing clause	Revised clause
			7. Limit of Aggregate Damages on Employer (EOT Claim) shall not exceed 10% (ten percent) of the contract Price (Eq. INR).
9.	Part 3, Section IX: Particular Conditions of Contract (PCC), Clause: Annexure IX-C, Key Dates/ Mile Stone	Annexure IX-C, Key Dates/ Mile Stone	Refer Appendix -5 of corrigendum-4
10.	Part-3: Conditions of Contract and Contract Forms Section X: Contract Forms: Contract Form-7, Contract Form-8	1. Contract Form-7: Parent Company Undertaking 2. Contract Form-8: Parent Company Guarantee	1. Contract Form-7: DELETED 2. Contract Form-8: DELETED
11.	Part 4: Commercial Package	BOQ_2075276 of Pricing Documents	BOQ_2075276 of Pricing Documents is replaced with revised BOQ_2075276

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Sr. No.	Clause No	Existing clause	Revised clause
12.	Part 2: Works Requirements Section VII-B: Particular Specifications. Clause 4.6.1.1 (vi) & Appendix-F: G (Point 18)	vi) Passenger Display Unit (PDU); Minimum 14" wide LCD type PDU to display at least Ticket amount messages, Current transactions type messages, Error codes and corresponding messages etc. in multi-language. Programmable screen saver shall be provided which shall include operating instructions, system status updates and advertising etc. PDU shall be provided with a fully adjustable stand (height and tilt adjustable). 2. Appendix – F – Indicative Specifications of Servers & Workstations: G. Indicative Technical Specification of TOM/EFO Hardware: Point 18: Passenger Display Unit: Size: Min 14 inch	vi) Passenger Display Unit (PDU) ; Minimum 7" wide LCD type PDU to display at least Ticket amount messages, Current transactions type messages, Error codes and corresponding messages etc. in multi-language. Programmable screen saver shall be provided which shall include operating instructions, system status updates and advertising etc. PDU shall be provided with a fully adjustable stand (height and tilt adjustable). 2. Appendix – F – Indicative Specifications of Servers & Workstations: G. Indicative Technical Specification of TOM/EFO Hardware: Point 18: Passenger Display Unit: Size: Min 7 inch
13.	Part 2: Works Requirements Section VII-B: Particular Specifications. Clause 4.8.1.1 (ii)	ii) TR shall consist of units for passenger use that will read QR coded Tickets, Contactless NCMC compliant cards and Contactless fare media and display selected data on a minimum 7inch backlit LCD screen.	ii) TR shall consist of units for passenger use that will read QR coded Tickets, Contactless NCMC compliant cards and Contactless fare media and display selected data on a minimum 5-inch backlit LCD screen.
14.	Part 2: Works Requirements Section VII-B: Particular Specifications. Clause 4.5.16.4	4.5.16.4 The ECU shall provide outputs that may be used, in the future, to drive external displays above the gate line which shall indicate the status of the gate aisle corresponding to the Fixed End Displays.	4.5.16.4 DELETED



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15.	Part 2: Works Requirements Section VII-B: Particular Specifications.	-	All Credit/Debit card POS terminal related scope of work stands deleted for Digital Kiosk, Cashless card dispenser & TVM.
16.	Part-1: Bidding Procedure Section-II: Bid Data Sheet Clause ITB 20.2 Point (iv)	The online bid shall be submitted by using Digital Signature Certificate (DSC) of authorized POA of bidder detailed at (i), (ii) & (iii) above.	The online bid shall be submitted by using Digital Signature Certificate (DSC) of Bidder.
17.	Part-1: Bidding Procedure Section-II: Bid Data Sheet E. Evaluation and comparison of Bids Clause ITB 29.1.1 (Additional Para) Point (iv)	The complete bid document including all corrigendum/addendum/clarifications issued time to time, prior to the submission of bid should be agreed by bidder and all required enclosures should be uploaded on the e-tender through digital signature of bidders or https://mahatenders.gov.in through Digital Signature (DSC) of authorized representative of all member of a JV/Consortium.	The complete bid document including all corrigendum/addendum/clarifications issued time to time, prior to the submission of bid should be agreed by bidder and all required enclosures should be uploaded on the e-tender through digital signature of bidders or https://mahatenders.gov.in through Digital Signature (DSC) of Bidder.

The other conditions shall remain same. Further modifications/amendments (if any) regarding aforesaid tender will be uploaded as and when required.


25/09/2025
Executive Director
(Procurement)
Maha Metro

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Appendix - 01

No.	Subject	Requirement	Single Entity	Joint Venture/ Consortium			Documentati on
				(existing or intended)			
				All Parties Combined	Each member	one member	
3.0	Financial Situation and Performance						
3.1 (b)	Bid Capacity	<p>Required Bid Capacity is INR 46.30 CR.</p> <p>Evaluation of Bid Capacity: -</p> <p>The Bidders will be qualified only if their available bid capacity is more than the above stated required bid capacity as per Maha - Metro assessment. Available bid capacity will be calculated based on the following formula:</p> <p>Available Bid Capacity= 2xAxN – B</p> <p>Where,</p> <p>A = Maximum of the value of Turnover in any one year during the last 05 (five) financial years reckoned up to 31st March'2025</p> <p>(Updated to the price level of 31 March 2025 assuming 5% (for INR portion) and 2% (for foreign currency portion) inflation per year compounded annually)</p> <p>N = Number of years prescribed for completion of the present work</p>	Must meet requirement	Must meet requirement	Must meet requirement as per their % share of participation in JV	N/A	Form-19

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		<p>B = Value of existing commitments as on first day of the month of this Bid submission i.e. for ongoing works during the completion period of proposed work.</p> <p>Proportionate value will be taken if it falls during the financial year.</p> <p>Note:</p> <ol style="list-style-type: none"> DELETED. A certificate issued from a Statutory Auditor certifying A and B value must be enclosed with the Technical bid. The certificate must be with UDIN 					
3.1 (c)	Net Worth	<p>The minimum Net worth of Bidder ending 31st March'2025 shall be positive.</p> <p>Note: Only the Statutory Auditor's certificate is required to be enclosed with the bid. The certificate must be with UDIN.</p> <p>Refer Note-12 for Net worth</p>	Must meet requirement	N/A	Must meet requirement	N/A	Form-16



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3.1 (d)	Net Profit	<p>A summary sheet of audited Financials sheets for the last 5 (five) years (FY 2020-21, 21-22, 22-23, 23-24 & 24-25) shall be submitted and must demonstrate the current soundness of the Applicant's financial position and indicate its prospective long-term profitability.</p> <p>The Bidder Must have made Net Profit before tax during any two of the last 5 financial years i.e. (FY 2020-21, 21-22, 22-23, 23-24 & 24-25)</p> <p>Note:</p> <ol style="list-style-type: none"> 1. The Statutory Auditor's certified summary sheet of each year need to be enclosed with bid. The certificates must be with UDIN. 2. Copy of audited Financials sheets also need to be submitted along with the bid 	Must meet requirement	N/A	Must meet requirement	N/A	Form-16
3.2	Average Annual Turnover	<p>The minimum average annual turnover** within the last 3 years shall be INR 46.30 CR.</p> <p>Note: -</p> <ol style="list-style-type: none"> 1. Last three years shall be (FY 22-23, 23-24 & 24-25) 2. In case of Companies, which follow Financial Year as Calendar Year (January to December), data for 2024 shall be treated as equivalent to the data of FY 2024-25 and so on. 	Must meet requirement	Must meet requirement	Must meet Min. 20% (Twenty percent) of the requirement	For Lead Member: Must meet Min. 51% (Fifty One percent) of the requirement	Form-17



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		<p>3. Statutory Auditor's certified summary sheet of audited balance sheet need to be enclosed with bid. The certificate must be with UDIN</p> <p>4. Copy of audited balance sheets also need to be submitted along with the bid</p>					
4.0	Technical Criteria						
4.1 (b)	<p>Specific Experience in Key activities – <u>Design,</u> <u>Supply,</u> <u>installation,</u> <u>testing and</u> <u>commissioning</u> <u>of Automatic</u> <u>Fare Collection</u> <u>System (AFC)</u></p>	<p>A minimum of *Similar Work contracts specified below that have been satisfactorily executed as a single entity or joint venture/Consortium member during last 7 (Seven) years (counted till date of NIT) as below</p> <p>1) At least ONE *Similar work satisfactorily executed & in operation</p> <p>a) With minimum value of INR 123 Crore (Incl. GST).</p> <p>or</p> <p>b) For minimum Twenty Six (26) stations for transport projects defined in *similar work.</p> <p>OR</p>	Must meet requirement	Must meet requirement	As per JV Member experience Note 6	As per Lead Member experience Note 7	Form – 21



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		<p>2) At least TWO *Similar works satisfactorily executed & in operation</p> <p>a) With minimum value of INR 77 Crore (Incl. GST) for each work</p> <p>or</p> <p>b) For minimum Sixteen (16) stations for transport projects defined in *similar work in each work.</p> <p>OR</p> <p>3) At least THREE *Similar works satisfactorily executed & in operation</p> <p>a) With minimum value of INR 61 Crore (Incl. GST) for each work</p> <p>or</p> <p>b) For minimum Thirteen (13) stations for transport projects defined in *similar work in each work.</p>					
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Notes:

1. *Similar Work: Shall Mean : Design, Supply, Installation, Testing and Commissioning of AFC System consisting of Open loop NCMC EMV/**Closed loop** and QR based ticketing system comprising of Central Computer System, Station Computer, Automatic Gates, Ticket Office Machines, and Network elements of AFC System, in Metro Rail/High Speed Rail/Semi High Speed/ Light Rail/**BRT** Transport project.
2. In case Similar work* executed is valued in foreign currencies, the work value shall be calculated in INR at the RBI Selling Rate published by the Reserve Bank of India with conversion date as specified in Sr No 3 below.
3. For Specific Experience: An escalation rate per annum may be applied assuming 5% inflation for Indian Rupees every year (or part thereof) and 2% for foreign currency portions per year (or part thereof). If the awarded contract was with PVC then inflation will be considered from date of LOA and if awarded contract is without PVC then inflation will be considered from original date of completion date of the contract. Currency conversion will be considered accordingly as per these dates. Bidder to submit documents pertaining to provision of PVC in the claimed work.
4. For Annual Turnover**: An escalation rate per annum may be applied assuming 5% inflation for Indian Rupees every year (or part thereof) and 2% for foreign currency portions per year (or part thereof).
5. **The claimed experience by bidder must be supported by a duly signed and stamped certificate from the main employer (relevant transport authority), Bidder shall submit the contact details of issuing authority of the certificates for verification.**
6. To qualify as member of **JV/Consortium**: Its each partner must have executed Similar work* satisfactorily executed & in operation, with minimum value of INR 30 Crore or for minimum 06 stations **for transport projects defined in *similar work** during the **last 07 (Seven) years** counted till date of issue of NIT in single contract.
7. To qualify as Lead member of **JV/Consortium**: Its lead partner must have executed Similar work* satisfactorily executed & in operation, with minimum value of INR 77 Crore or for minimum 16 stations **for transport projects defined in *similar work** during **the last 07 (Seven) years** counted till date of issue of NIT in single contract.
8. In addition to above, bidder, and in case of **JV/Consortium**, its lead partner, must have executed Similar Work*, EITHER outside the country of its incorporation in at least one (1) country OR in INDIA, during last 07 (Seven) years counted till date of issue of NIT., having value equal to or more than INR 77 Crore or for minimum 16 stations **for transport projects defined in *similar work** and in operations in single contract.
9. Maximum number of entities in JV/Consortium should be 3 (three) (Lead Member+ 2 Other Member)



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10. For **JV/Consortium** Member proportionate quantum of experience of previous works up to the percentage share of participation in the previous **JV/Consortium** shall be considered.
11. Existing JV/Consortium already worked/working in any department & meeting the eligibility criteria of *Similar work, mentioned in Section-III of Bid Document, can bid with the same **JV/Consortium** configuration as a Single Entity.
12. Net Worth (NW) means the aggregate value of the paid up share capital and all reserves created out of the profits and securities premium account, after deducting the aggregate value of the accumulated losses, deferred expenditures and misc. expenditures not written- of, as per the audited balance sheet but does not include reserves created out of revaluation of assets, write back of depreciation and amalgamation.



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Form - 16

Financial Situation and Performance of Bidder

Bidder's Name: _____

JV Member's Name _____

Tender Number _____

Name of Work _____

Lot No: _____

(Amount in INR)

	Historic information for previous 05 Financial years				
Type of Financial Information	2020-21	2021-22	2022-23	2023-24	2024-25
Statement of Financial Position (Information from Financial Statement)					
Total Assets (TA)					
Total Liabilities (TL)					
Current Assets (CA)					
Current Liabilities (CL)					
Current Ratio (CA/CL)					
Liquid Assets (LA)					
Liquid Liabilities (LL)					
Liquid Ratio (LA/LL)					
Working Capital (WC=CA-CL)					
Net Worth (NW)					
Cash & Cash Equivalent (Including Bank Balance)					
Sundry Debtors					
Information from Income Statement					
Total Revenue/Turnover (TR)					
Profits Before Taxes (PBT)					
Profit After Taxes (PAT)					

* See Section _____, Evaluation and Qualification Criteria, Clause No. _____

(Signature of the Authorised Signatory):

(Name and designation of the Authorised Signatory):

Seal of Bidder.

Note:

- 1) In addition to the above Form, the Bidder shall provide a Certificate from Statutory Auditor certifying the above information along with valid UDIN.
- 2) Bidder are required to attach Financial Statements of preceding five Financial Year.
- 3) Net Worth (NW) means the aggregate value of the paid up share capital and all reserves created out of the profits and securities premium account, after deducting the aggregate value of the accumulated losses,



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deferred expenditures and misc. expenditures not written- of, as per the audited balance sheet but does not include reserves created out of revaluation of assets, write back of depreciation and amalgamation.

- 4) *For all annual financial statements, periods mentioned are ending with 2024-25. In case of ending of financial is Month of December then, annual financial statements shall be ending with financial year 2024 and so on.*



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Form-17

Average Annual Turnover

Bidder's Name: _____

JV Member's Name _____

Tender Number _____

Name of Work _____

Lot No: _____

(Amount in INR)

Year	Annual turnover data			Updated value to Current year (Note 2)
	Total Turnover (Indicate amount & Currency)	Exchange Rate	Equivalent Amount (INR)	
2024-25				
2023-24				
2022-23				
Average Annual Turnover *				

* See Section _____, Evaluation and Qualification Criteria, Clause No. _____

(Signature of the Authorised Signatory)

(Name and designation of the Authorised Signatory):

.....

Seal of Bidder.

Note:

- 1) In addition to the above Form, the Bidder shall provide a Certificate from Statutory Auditor certifying the above information with valid UDIN.
- 2) All prices in foreign currency will be converted to Indian Rupees using the Exchange Rates for those currencies published by the Reserve Bank of India on the day 28 days (Base date) prior to the date of Bid submission.



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Form-19

Current Contract Commitments / Works in Progress

Bidder's Name: _____

JV Member's Name _____

Tender Number _____

Name of Work _____

Lot No: _____

Bidders and each member to a JV should 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.

Current Contract Commitments

(Amount in INR)

Year	Annual turnover data			Updated value to Current year (Note 2)
	Total Turnover (Indicate amount & Currency)	Exchange Rate	Equivalent Amount (INR)	
2024-25				
2023-24				
2022-23				
2021-22				
2020-21				

Note:

- 1) In addition to the above Form, the Bidder shall provide a Certificate from Statutory Auditor certifying the above information with valid UDIN.
- 2) All prices in foreign currency will be converted to Indian Rupees using the Exchange Rates for those currencies published by the Reserve Bank of India on the day 28 days (Base date) prior to the date of Bid submission.

S.No.	Name of Contract	Employer Name, address, Contact details, Email	Value of Outstanding work (Eq. USD/EURO)	Value of Outstanding work (Eq. INR)	Estimated Completion date	Average monthly invoicing of last six months (US/EURO/monthly)	Average monthly invoicing of last six months (INR monthly)
1							
2							
3							
4							
5							
6							
	Total						

(Signature of the Authorised Signatory)

(Name and designation of the Authorised Signatory):

.....

Seal of Bidder.

Note: In addition to the above Form, the Bidder shall provide a Certificate from Statutory Auditor certifying the above information.



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Form No.-38

DELETED



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Form No. -39:

DELETED



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Appendix - 02

Nagpur Metro Rail Project Phase-II consists of the following corridors:

Section	Number of Stations
Corridor – 1A (Reach 1A ¹) Eco Park (At Grade) to Metro City Station	2
Corridor – 1B (Reach 1A ²) Ashokvan to MIDC ESR (Elevated)	8
Corridor – 2A (Reach 2A ¹) Pili Nadi to Lekha Nagar (Elevated)	6
Corridor – 2B (Reach 2A ²) Cantonment to Kanhan River (Elevated)	6
Corridor – 3A (Reach 3A) Hingna Mount View to Hingna (Elevated)	7
Corridor – 4A (Reach 4A) Pardi to transport Nagar (Elevated)	3
Total	32

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Appendix - 03

Phase -1- BOQ

Sn	Description	Qty
1	Entry Gate	73
2	Exit Gate	124
3	Reversible Wide Gate	57
4	TOM	59
5	EFO's	40
6	Station Computers	45
7	Ticket Readers	50
8	OCC CC Workstations	5
9	NMS	1
10	Card Personalization -printers	1
11	Digital Kiosk	44
12	Handhelds	31
13	Parking ETMs	31
14	Feeder Vans ETMs	52

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Appendix - 4

4.16 AFC Sub Systems -Ticket Vending Machines (TVM)

4.16.1 Scope and Location

4.16.1.1 The Contractor shall provide Ticket Vending Machines (TVMs) within the unpaid side of the Ticket Hall at each station.

4.16.1.2 TVM shall be installed as a free-standing unit in the station concourse. For free standing unit TVM, the roof shall be provided with a slope / slant arrangement for security considerations. Only TVM front side shall be fully accessible to the Public.

4.16.2 Summary of Main TVM Functions

4.16.2.1 Provide interactive, user-friendly, graphical user interface for customer use while performing ticket vending and obtaining fare related information;

4.16.2.2 Generate and dispense QR Coded tickets in paper for single, return and group journeys with the facility to vend up to ten (10) tickets in one transaction;

4.16.2.3 Provide 'Add Value' recharge/reload functions for NCMC contactless card;

4.16.2.4 Support all fare structures as per approved Business rule;

4.16.2.5 Accept fare tables downloaded via CCS.

4.16.2.6 TVM Shall support remote Firmware upgradation from CCS and SCS.

4.16.2.7 Accept payment by a configurable selection of banknote, by all Digital mode of payments like UPI/Wallet and payment by NCMC cards;

4.16.2.8 Deleted

4.16.2.9 Dispense change in coins and banknotes, the quantity of which shall be a programmable feature;

4.16.2.10 Issue payment receipts on request;

4.16.2.11 Operate when required in a degraded mode such as no change, cash only, etc.

4.16.2.12 Be able to be easily upgraded in the future to work in conjunction with other fare media options.

4.16.3 TVM CONSTRUCTION

4.16.3.1 General Design Requirements

- i) Each TVM shall consist of a compactly designed, free standing, self-supporting cubicle suitable for installation in the unpaid areas of each station concourse;
- ii) Designed ergonomically with a high-quality man machine interface for passenger interaction;



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- iii) All materials shall be durable and non-corrosive.
- iv) External surfaces shall be manufactured from stainless steel with thickness of minimum 2mm and shall be smooth with no sharp edges or corners. Also, there shall be no sharp edges inside the TVM.
- v) The construction shall be vandal and tamper resistant, equipped with environmental controls, mechanically protected with an external surround barrier.
- vi) A color, LCD/LED touchscreen with toughened glass shall be supplied. The size of the touchscreen shall be of minimum 24-inch.
- vii) All modules included in the TVMs shall be of current manufacture.
- viii) The Contractor shall support the TVM software and hardware for the design life of the system.
- ix) All units within the TVM shall be fully withdrawable from the front for maintenance access.
- x) Access to the TVM for servicing purposes shall require the use of a pass and high security access keys to open the associated covers and locks.
- xi) TVM shall have a passenger information display at the top of the TVM cabinet. The display shall be visible at least 10 meters from the machine, enabling the patron to know operational condition of the Machine.
- xii) TVM MMI flow shall follow use cases and business rules. Detailed flow of MMIs with actual graphics, languages in Marathi, English and Hindi shall be developed for each functionality, documented with explanations for each process and shall be submitted for Employer's approval at least 6 months before the commencement of installation activities. All messages and translations shall be certified, for correctness of meaning, by an authorized Government agency.
- xiii) Each TVM MMI/screen should have a 'help' access through an information button marked as 'i' at the bottom of the screen. Contents of the help screen shall be finalized in consultation with the Employer for each screen, however, the contents should be accessible at CCS and operator should be able to change/rewrite the contents if required based on user feedback or any changes.
- xiv) Design of housing and enclosure shall be submitted to the Engineer/ Employer for review and approval.

4.16.3.2 User Accessibility and Operation

- i) The design shall be compliant with the 'Persons with Disabilities' Act of India;
- ii) Physically accessible to users with operating parts and slots at a maximum height above finished floor level of 1200mm and a minimum

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height of 500 mm and in compliance with disability norms. Exact dimension shall be finalized during design stage.

- iii) The diameter of any operating buttons required shall be a minimum of 20mm, be suitably spaced and protrude sufficiently to enable the buttons to be used by those who rely upon palm pressure.
- iv) QR code Tickets, Payment receipts and change shall be easy to retrieve by people with limited manual dexterity.
- v) Design shall facilitate use by visually impaired people with all controls within comfortable reach range.
- vi) Minimum force shall be required to operate any controls.
- vii) Banknote slots shall be equipped with a mechanical arrangement which open only during a payment transaction but shall remain closed under the following minimum conditions:
 - a) Fare amount due has been inserted;
 - b) Card is inserted in the bank card reader;
 - c) Cancel button has been pressed or the transaction is automatically cancelled;
 - d) TVM or Ticket or cash processing unit fault condition.

4.16.3.3 Color

- i) External metal work shall be painted in a color using latest technology or use adhesive graphic sheet, which shall be agreed with the Employer.
- ii) To facilitate ease of use the constituent elements of the equipment shall have contrasting colors and texture from the main body of the TVM.
- iii) Buttons shall contrast well with the background and their function shall be described both in text and tactile form.

4.16.3.4 Fire Safety Compliance

In sub-surface stations, materials shall be compliant Fire Safety Performance of Materials regulations.

4.16.3.5 Cabling and Equipment Fixing

- i) TVM shall be suitable for floor mounting.
- ii) Equipped with a 100mm high mounting plinth and fixing facilities for floor mounting.
- iii) Equipped with gland plates for bottom cable access.
- iv) Cables shall be securely fixed, glanded into the TVM structure, routed below the TVM and hidden from view.

4.16.3.6 Lighting

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Equipped with suitable lighting and LDR sensor for automatic adjustment of lighting levels so that information and operating instructions are clearly visible to the users under varying ambient lighting conditions.

Sufficient lighting arrangement shall be provided inside the TVM for good visibility for ease of maintenance – light sources (such as globe, LED arrays) shall be placed at strategic places inside the TVM.

4.16.3.7 Maintenance

All components shall be readily accessible, mounted on withdrawable drawers wherever necessary for equipment maintenance, removal and replacement of consumables, coins and banknotes etc.

Maintenance Touchscreen: A set of full-sized keyboards, mouse and a touchscreen LED/LCD display (minimum 11”) shall be provided inside the TVM exclusively for maintenance to avoid maintenance personnel going around the front door to read the display during maintenance.

4.16.3.8 Labelling

- i) A label shall be provided to identify the equipment.
- ii) All user functions shall be clearly and indelibly labelled providing clear instructions on the purchase and processing of fares.
- iii) Braille lettering shall be provided to facilitate operation by those with impaired vision. All messages in Braille shall be certified, for correctness of meaning, by an authorized Government agency.
- iv) Suitable stickers shall be provided on the TVM outer case to improve the aesthetics of TVM or for advertisement purpose as decided by the Employer.

4.16.3.9 Security and Access

- i) Equipped with suitable electro mechanical locks for maintenance access by authorized staff to appropriate TVM functions for set- up, maintenance and diagnostics, etc.
- ii) The Front inbuilt camera shall capture the approaching person's image to protect the terminals from the vandals.
- iii) The System shall record all salient details of the person attempting entry and such details shall appear in relevant reports.
- iv) All coins and banknotes held within the TVM shall be suitably protected to prevent unlawful retrieval by TVM users.
- v) On detection of a TVM Security alarm an audio alarm broadcast and visual indication shall be initiated in the SCS & CCS.
- vi) Access to components containing money shall be restricted to authorized revenue staff only by the use of special keys or additional PIN entry to be agreed with the Employer.

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- vii) It shall be possible to remove all coin from the TVM by dumping all coins and removing bulk hopper. It shall also be possible to remove all Bank Notes from the re-circulating unit into cash box. All the details shall be recorded for audit purposes.
- viii) All removable components including cash box, containers and change hopper shall be sized, positioned and provided with lifting handles such that they can be removed and inserted without requiring more than the average strength or dexterity of a young female Indian person.
- ix) TVM shall provide a complete audit trail of all transactions, logins, transfers and retrieval of cash and other payments.

4.16.4 Summary of TVM Functional Requirements

4.16.4.1 TVM Equipment Facilities

- i) The TVM equipment housing shall as a minimum accommodate the following facilities:
 - a) Banknote Recycler;
 - b) Banknote cash box/vault;
 - c) Coin cash box/vault;
 - d) Banknote loading mechanism;
 - e) Coin issuing unit/ Hopper;
 - f) QR Coded ticket printing unit;
 - g) Digital payment platform handling facilities like UPI/Wallet.
 - h) DELETED
 - i) Payment Receipt printer;
 - j) Paper Rolls for Receipts and paper QR Ticket;
 - k) Passenger selection Touch screen display unit;
 - l) EMV/NCMC compliant Contactless fare media Reader/Writer;
 - m) Passenger Information Display Unit;
 - n) Electronic control module;
 - o) Power supply unit and UPS;
 - p) Bulk Coin Hopper;
 - q) Alarm Unit;
 - r) Inbuilt Camera;
 - s) Audio Speaker and jack;
 - t) Touch screen display unit for Maintenance;
 - u) Induction Loop;

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- v) Vibration and temperature sensor;
- w) Keyboard & Mouse.

4.16.4.2 Passenger Selection and Display Unit

- i) The user interface shall be a Windows based, Graphical User Interface (GUI), color display which is user-friendly, to provide passengers with an automated self- service facility for ticket purchase and information.
- ii) The GUI shall be designed in a chronological order and minimum number of selections to perform the functions.
- iii) Induction loops shall be supplied for those with impaired hearing.
- iv) Help screens and operating instructions shall be selectable.
- v) Programmable screen savers shall be provided which shall include operating instructions, system status updates and advertising, etc.
- vi) Separate LCD Display (separate from the Passenger selection Touch screen display unit) which shall display status information and messages, etc.
- vii) FDK with Braille lettering shall be provided to facilitate operation by those with impaired vision. All messages in Braille shall be certified, for correctness of meaning, by an authorized Government agency.
- viii) Speech generated information and prompts, with adjustable volume control, shall be provided in relation to activities such as purchasing instructions, ticket dispensing and currency insertion.
- ix) These facilities shall be supplemented by audio jack and audio induction loop facilities for the use of those with impaired hearing.
- x) The final method to be adopted for selection, graphics, information and user input screens shall be designed and implemented in cooperation with the Employer, all of which shall be subject to the Contractor obtaining from the Employer a 'Notice of No Objection'.
- xi) Upon activation of the destination selection, the associated fare value shall be displayed:
 - a) Banknotes shall be accepted only after a selection has been made by the passenger.
 - b) The fare value shall be decremented when banknotes are inserted and accepted.
 - c) Any overpayment shall be returned as change in an optimum combination of Notes and coins of the largest available denominations.

4.16.4.3 Multilanguage Support

- i) The default language at the start of each new transaction shall be



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Marathi. But it shall be possible to select the English language /Hindi Language prior to starting any new transaction. Notwithstanding the above, the default language to be used will be finalized during detailed design stage.

- ii) It shall be possible for the user to specify a preferred language, either Marathi, Hindi or English, which shall be encoded on the fare media.
- iii) Each subsequent presentation of the fare media to a Contactless fare media RW device shall cause the resulting display to revert to the preferred language. However, there shall be provision to select other language options.

4.16.4.4 User Information

- i) The TVM shall display and provide audio prompts, as necessary, concerning easy to understand operating instructions and information on fares, ticket purchase etc.
- ii) Railway Maps shall be provided to show the Metro lines and stations together with other major railway network routes, stations and routes within Nagpur. User shall be able to select destination station, zone of travel from the particular station at which the user is currently located. Based on the inputs and business rules, TVM should provide the ticket and payment information to the user to proceed with the ticket/product purchase.

4.16.4.5 Methods of Payment

- i) The following payment methods shall be accepted:
 - a) All banknotes issued by the Reserve Bank of India and currently in circulation. Specific number of denominations accepted at any given time, which shall be a programmable feature;
 - b) Deleted.
 - c) All digital Payment platforms such as UPI, Wallet.
 - d) NCMC Contactless Card.

4.16.4.6 Provision of Change

- i) Change shall be issued in banknotes and coins.
- ii) The TVM shall normally give change but shall be capable of operating in a non-change giving mode and shall display a clear message to passengers when operating in this mode.
- iii) The TVM shall include automatic bank note re-cycling facilities.
- iv) The maximum amount of change to be dispensed in a single transaction shall be defined by a downloadable parameter;
- v) If this pre-defined amount is exceeded by insertion of a large

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denomination banknote the banknote shall be rejected.

- vi) If sufficient Bank Note/coins are not available to give change, the TVM shall automatically go into “no change” mode.
- vii) In “no change” mode, the TVM shall display prominently a notice in Hindi, Marathi and English reading “NO CHANGE AVAILABLE” “Choose Fare Product and Follow Instructions”; If Passenger tends exact amount, no further message is given, and Fare Product is issued. If passenger does not tend exact amount, TVM shall display the message “You have not tended exact amount and would return the tended amount. Exact wordings and contents of all such messages shall be agreed with the Employer during design phase.
- viii) Once a configurable predetermined number of Bank Note /coins have been accumulated, the TVM shall automatically revert to change giving mode.
- ix) In “no change” mode, the TVM shall accept payment through NCMC card and UPI/Wallet payment methods, TVM shall display appropriate message to the passenger accordingly.
- x) TVM shall generate “due amount receipt” to passenger in case of any failure occurred during dispense of change amount.
- xi) Alternative approaches to automatic switching between change giving and no- change modes may be considered by the Employer.

4.16.4.7 **Fare Media**

- i) QR Coded paper Tickets.
- ii) Cart option for multiple tickets with a single transaction.
- iii) Recharge /Reload to existing contactless fare media.

4.16.4.8 **Contactless fare media Reader/Writer**

- i) Contactless smart card reader/writer shall be certified with latest EMV and NCMC specifications issued by MOHUA.
- ii) Contractor shall obtain L3 certificate from all payment schemes (Approved by RBI) for the EMV/NCMC card reader/ writer application.
- iii) Contactless smart card Reader/Writer shall be provided which will provide users with the following facilities for NCMC Contactless Card:
 - a) Recharge/top-up.
 - b) Display of validity and remaining balance.
 - c) View travel history.
 - d) Balance update.
 - e) Selection and update the language preference.



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- iv) Contactless smart card reader/writer shall be compatible to process other fare media such as NFC.

4.16.4.9 Printing Facilities

- i) Separate printer with associated printing paper shall be provided:
- a) For payment transaction receipts. The printer shall be capable to support Minimum 100 GSM paper of width from 76-80 mm and diameter 180 To 200 mm.
- b) For QR code Tickets The printer shall be capable to support Minimum 100 GSM paper of width from 76-80 mm and diameter 180 To 200 mm.
- ii) As a maintenance function, audit reports such as diagnostics, sales, revenue, stock status etc.,
- iii) The printer shall be capable of printing legible, high quality, non-erasable graphics/text which shall last up-to minimum 30 days. For QR tickets, printer shall be capable to print all alpha numeric characters as per CDAC specification (refer Appendix B2). Type and make of both the printers shall be proposed for approval of Employer.
- iv) Printer shall have at least two alarms – 'Empty' and 'Almost Empty' for the paper.

4.16.4.10 Transaction Processing Time

- i) The processing time for a QR code ticket transaction shall be a maximum 08 seconds.
- ii) The Processing time for NCMC contactless card Top-Up transaction shall be maximum 02 seconds.
- iii) The time window shall be between the successful payment acknowledgement by TVM and issue of a QR paper ticket/NCMC card Top-Up.

4.16.4.11 Transaction Cancellation

- i) The TVM shall cancel transactions automatically on occurrence of any of the following:
- a) Failure of the TVM ticket issuing facilities.
- b) Failure of NCMC contactless card Top-up/recharge/reload.
- c) Failure of Payment.
- d) Transaction timeout.

Note:

Other cancellation scenarios shall be finalized by Employer during design period. Reversal process/procedure of payment to user/passenger will be finalized during the design stage in accordance with the finalized Business rule and Bank's procedure.

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- ii) Regarding transaction timeout:
 - a) If the transaction process has not been completed within pre-configurable time periods relevant to each successive transaction stage the TVM shall issue an audio and visual warning to the user.
 - b) If the required action has not been performed within a pre-configurable time delay the TVM shall be automatically reset to a ready/start condition.

4.16.4.12 Power Supply and Internal Battery Back-Up

- i) TVM shall be equipped with uninterruptible power supply suitable for completing the in-process transactions, on main power supply loss.
- ii) The TVM shall ensure that no further selection of QR code Ticket or recharge / Top-up is accepted on main power supply loss and TVM shall go to out of service.
- iii) If the duration of main power loss exceeds 10 minutes, the TVM shall commence a shutdown procedure.
- iv) After the power restoration the TVM shall restart and restore the operation automatically.
- v) The alarm/status of out-of-service/shutdown/restore operation shall be sent to the SCS and CCS for SLE monitoring and for respective reports.
- vi) The Contractor shall facilitate all the status/information/alarm of UPS at maintenance display of TVM.

4.16.4.13 Equipment Failure

The TVM shall continue to provide a limited service and shall display appropriate messages to alert the user under the following failure conditions:

Table 4.16.1 – TVM Operation under Defined Failure Conditions (indicative)

TVM Failure Condition	Resulting Action
QR Ticket Printer Failure	TVM application shall print the QR ticket from receipt printer without any hinderance in operation. An alarm to be generated and sent to SCS & CCS.
Receipt Printer Failure	TVM application shall print the receipt from QR printer without any hinderance in operation. An alarm to be generated and sent to SCS & CCS.
Both Printer Failure	TVM shall continue operation in degraded mode and allow passenger for NCMC Contactless Card operation. An alarm to be generated and sent to SCS & CCS.

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Failure of banknote handling facilities	TVM shall continue operation in degraded mode and allow passenger for UPI/Wallet payment. An alarm to be generated and sent to SCS & CCS.
Failure of UPI/Wallet payment facilities	TVM shall continue operation in degraded mode and allow passenger for Banknote and card operation. An alarm to be generated and sent to SCS & CCS.
Failure of coin Hopper facilities and Insufficient change available	Only exact fare via Bank Note shall be accepted and allow passenger for UPI/Wallet payment.
Network failure	TVM shall continue operation in degraded mode and allow passenger for payment via bank note. An appropriate alarm to be generated and sent to SCS & CCS.
Any other scenario shall be decided during design stage.	

4.16.4.14 TVM Cash Boxes

- Each TVM shall be equipped with a minimum, one (1) coin cash box and separately one (1) Banknote cash box.
- The Contractor shall ensure that sufficient cash boxes are available to enable the TVM to stay in operation with due allowance for boxes in transit and boxes being processed at the cash counting location.
- The design of the cash boxes shall ensure security and durability in service.
- A carrying handle appropriate to the weight of a full cash box shall be built into each cash box.
- Two separate mechanical keys shall be used one for extracting the cash box from TVM & Other key for opening cash box.
- Once the cash vault has been removed it shall be impossible to open it without a special key held by authorized staff at a secure location only.
- Each cash box shall be labelled with its own unique identification number which shall be a machine-readable electronic identity number.
- Reports shall be generated automatically each time a cash box is inserted and removed, and the identification number shall be recorded on reports which shall be available for printing on demand from the Station Computer System.
- Unauthorized removal/insertion of cash box shall generate an alarm.
- The System shall employ a tamperproof audit procedure to ensure the

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security of cash collection from the TVM.

- xi) The audit reports generated at the cash counting facility shall be reconciled against the station computer cash reports to ensure all money reported as collected by the TVM is accounted for.

4.16.4.15 **Storage Capacity for Cash and Smart Media Vaults**

- i) All vaults for storage, issuing and recirculation of cash and smart media shall be made of durable material.
- ii) The following provisional minimum capacity shall be provided:

Table 4.16.2 - Capacity of Cash Vaults

TVM Vault	Minimum Qty	Minimum Capacity
Coin cash Box	1	3000 Coins or above
Coin Hopper	3	1000 Coins
Banknote cash Box	1	1400 Notes or above
Banknote Escrow	1	15 Notes
Bank Note Recycling Unit Minimum 4 denomination	1	With 4 denominations of Minimum 30 each.

- iii) The status of all vaults shall be monitored and provided to SCS and CCS in a dashboard form for viewing by the AFC Operator.
- iv) When vaults approach a configurable, pre-defined minimum level (nearly empty) or maximum level (near full) a visual alarm shall appear on the SCS & CCS.

4.16.4.16 **Coin Handling Facilities**

Each TVM shall be equipped with the following coin handling facilities:

- i) The TVM shall be capable of dispensing a minimum of 3 different denominations of coins;
- ii) The amount of change which may be dispensed shall be limited in value and shall be a configurable feature;

4.16.4.17 **Banknote Handling Facilities**

Each TVM shall be equipped with the following banknote handling facilities:

- i) The Banknote validators shall be configured to accept all current Banknotes with four-way insertions and shall be used to check the validity of banknotes inserted by the user into the TVM;
- ii) Banknotes which are not valid and other foreign materials processed by

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the banknote validator shall be rejected and returned;

- iii) Banknote holding facility (Escrow) shall retain verified banknotes until the TVM transaction has been completed;
- iv) Banknotes shall be returned from Escrow to the user if the transaction is cancelled;
- v) Banknotes initially held in Escrow shall be automatically deposited in the recycling casset or the banknote vault once a transaction has been completed;
- vi) The System shall have the facility of recycling of deposited/collected notes for providing balance amount to the passenger. The banknote recycler mechanism shall be high performance, extremely reliable, proven and must be procured from a reputed manufacturer which shall also meet Reserve Bank of India (RBI) guidelines.
- vii) Normally all change shall be provided in an optimum combination of Notes and coins.
- viii) New banknotes (and coins) and new variants of existing denominations may be introduced by the Reserve Bank of India (RBI) from time to time. Cash handling devices of the TVMs shall be updated to accept the new and remove obsolete items. It shall be the AFC Contractor's responsibility to provide updated firmware and banknote bill sets till the end of Contract Period without any additional cost to Employer.
- ix) Onshore facilities and resources in India are desirable from the equipment manufacturers to reduce the time lapse from introduction of new denominations by RBI, upgrading the cash handling modules of the TVMs and for providing all levels of maintenance support with least turnaround time.
- x) The firmware/bill sets update shall be possible to be carried out remotely from CCS.
- xi) The Contractor shall facilitate all the status/information/alarm of BNR at maintenance display of TVM.

4.16.4.18 **Deleted**

4.16.4.19 **UPI/Wallet Payment Facilities**

- i) The Contractor shall integrate TVM with UPI/Wallet (Static & Dynamic) payment system of Employer Selected Bank/FI to enable UPI/Wallet facility for the passenger. The dynamic QR shall be displayed on TVM screen for completion of payment.
- ii) No manual intervention is required to complete the payment transaction, All the Integration process regarding payment/ transaction/report/ settlement shall be API based and automatic.
- iii) There shall be built in option to enable /disable the UPI/Wallet payment option

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in TVM maintenance menu and provision of software command from SCS & CCS.

- iv) Reversal/refund of payment to user/passenger (failure cases) shall be finalized during design phase in accordance with the Bank/FI procedure.
- v) Provision for accepting payment via static QR for UPI/Wallet payment to be facilitated.

4.16.4.20 Diagnostics and Fault Displays

- i) Self-diagnostic facilities shall be provided to establish the fault status of the equipment, which shall include but not limited to the status of consumable items, and the status of the coin and banknote vaults for receiving cash and providing change.
- ii) The TVM shall provide an indication to the user, if the equipment is out of service or whether there are any restrictions on user functions available.
- iii) The 'Out of Service' display shall be distinct from the passenger selection display unit which shall be illuminated when the machine is out of service.
- iv) Detailed fault diagnostic alarms, event alarms and security alarms shall be monitored by the AFC SCS & CCS, specific details of which shall be agreed between the Contractor and the Employer during detailed design. From the SCS & CCS, the operator shall be able to perform all relevant tasks relating to monitoring, diagnostics and operation including turning out of service; disable or enable customer-facing functions such as NCMC card and UPI/Wallet payment platform use, view the TVM status including change giving status, QR code ticket stock, fill levels of coin hoppers, banknote cashbox, etc., and TVM overall status.
- v) The TVM shall initiate an alarm at SCS & CCS in the event of unauthorized access.

4.16.4.21 Maintenance Terminal

- i) A built-in maintenance terminal shall be provided to permit revenue and maintenance staff to gain access to various registers and diagnostic facilities so that all relevant information can be obtained directly at the TVM for service and repair.
- ii) All such access shall be subject to a hierarchical, permissions-based access rights regime which shall allow access by individuals dependent upon their pre- authorized level of access.
- iii) The maintenance terminal shall also be used to enter or adjust stock of Ticket media for QR code tickets and quantities of Coins. The detailed procedure to be decided during design phase and to be approved by Employer.

4.16.4.22 TVM Audit Registers



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The Audit Registers of the TVM shall include, but not limited to, the following:

- i) Number of QR Coded Tickets issued;
- ii) Value of QR Coded Tickets issued;
- iii) Number of NCMC topped-up;
- iv) Total value added to NCMC topped-up;
- v) Number of times out of service;
- vi) Number of times in maintenance mode.
- vii) BNR transaction cycle.

4.16.5 TVM Standalone Operation

4.16.5.1 In degraded mode, on loss of communication with the CCS, the TVM shall operate in a standalone configuration as per the approved/agreed operational procedure/ Business rule.

4.16.5.2 The TVM shall capable to log all the transactions and diagnostic information for a minimum period of 7 Days online and 30 Days offline. Detailed design (Hardware and software) shall be approved by Employer.

4.16.5.3 The TVM shall be capable to facilitate the recovery of transaction data & Logs in case of ECU failure.

4.16.6 TVM Interface to AFC SCS & CCS

- i) Each TVM shall be linked to the SCS & CCS via the local AFC LAN.
- ii) Communications between the TVM and SCS & CCS shall include:
 - a) Uploading of transaction data and statistics;
 - b) Reporting on diagnostic information on equipment status, etc.
 - c) Downloading operating instructions, configuration data including software updates, equipment configuration and fare tables, etc., all the relevant operation modes and commands.
 - d) Communicate data associated with the verification of Bank Note, UPI/Wallet payment platform transactions, etc.
 - e) Receive commands on equipment operation.
 - f) An audio alarm in conjunction with a visual alarm on the AFC HMI shall be provided in the SCS in case of "TVM - Out of Service" and visual alarm in CCS.
- iii) Any other interface and integration required for operation of TVM.

Table 4.16.3 – Indicative Specifications of Ticket Vending Machine:

System	Item	Specification
Cabinet	Material	Stainless Steel (SS 304 grades, minimum thickness 2mm)

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	Type	Front Side Maintenance
Electronic Control Unit	CPU, RAM, Storage	Latest version of: Intel processor, Minimum 8 Gb RAM, Minimum 256 Gb SSD Storage.
Contactless fare media Reader / Writer	EMV/NCMC Contactless Card Reader/Writer: Terminal should be capable of processing the NCMC contactless card of Visa / Master Card / RuPay or any other scheme approved. EMV smart cards should be compliant with ISO 14443-A, B. Certified with latest EMV specification (Level 1 & 2) and NCMC Specifications, support for NFC devices, Anti-collision mechanisms, Capable of performing symmetric and asymmetric cryptography techniques for processing. EMV contactless cards, minimum 3 SAM slot, Minimum 256 MB DDR RAM, 512 Mbytes Nand Flash Memory.	
Touch Screen	Language	Marathi, Hindi, English.
	LCD/LED	Minimum 24-inch with LDR.
	Touch	Infrared rays interception/Projected capacitive
Passenger Information Display (PID)	LCD/ LED Type	High resolution
	Display Size	To be decided during design stage
Maintenance Display	Language	Marathi, Hindi, English
	LCD/LED	Minimum 11-inch
	Touch	Infrared rays interception/Projected capacitive
Banknote Module	General Specification	Shall be configured to accept all current bank notes. Recycler of minimum 30 notes for each of 4 Denominations. Note box capacity –1400 notes, Loader mechanism
Coin Module	General Specification	Coin Hopper – 1000 x 3
Printer	Type	Thermal
Power Supply (PSU) Unit	Input voltage (V)	AC 220 ~ 240
Alarm Unit	Buzzer	90dB
Any other item required to fulfil the scope.		

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Following added in Existing Clauses:

1. Clause: 2.2.2 NMRP Phase-II Station/OCC/BCC AFC Facilities:
Point (iii-A) Ticket Vending Machine (TVM).
2. Clause 2.2.2 Point (xx): All consumables including, but not limited to, Security Access Modules (SAMs), thermal paper roll for all ticket issuance devices for printing QR-code tickets, papers for printing receipts, paper, printer toners, cartridges, for operations and maintenance of Gates, Digital Kiosk, TVM, TOM, EFO etc. for complete Contract Period including DLP & CAMC period.
3. Clause 2.4.1.6 Point (v): CCTV provisions for image of the Digital Kiosk & TVM due to unauthorized access or equipment being tampered.
4. Clause 3.1.2.3A: TVM shall be capable of issuing & top-up/reload at least 8 separate transactions of single/return journey QR Coded Tickets and NCMC card respectively in a minute, assuming the user has correctly input all the requirements.
5. Clause 3.1.2.9: All indoor equipment such as Central Computer, Station Computers, Networking Equipment, Routers, TOMs etc. shall normally be installed in air-conditioned rooms and AG, Digital Kiosk, **TVM**, Card Dispenser and TR shall be installed in semi-outdoor conditions. The design of the System shall be such that all indoor equipment shall be tested for satisfactory performance from 0° C to 50° C for a minimum duration of 2 hours if air conditioning fails in the rooms in which it is located. All components and equipment of the system installed in semi-outdoor environment such as but not limited to AG, Digital Kiosk, **TVM**, Card Dispenser and TR shall be tested for satisfactory performance from 0° C to 50° C.
6. Clause 3.3.7.1: Table 3.4 – Failure Severity Levels:

Equipment/ Sub-System	Consequence of Failure	Maintenance Impact	Severity Level
Ticket Vending Machine (TVM)	Delay in issue of tickets and passenger dissatisfaction	Urgent Maintenance Intervention	Severity II
Ticket Vending Machine (TVM)	Delay in Fare Media top- ups and passenger dissatisfaction	Urgent Maintenance Intervention	Severity II

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7. Clause 3.3.8.3: Table 3.5 – Availability Targets:

Severity Level	Acceptable Failure Rate	Minimum Availability Figures (%)	AFC Sub-Systems and Equipment
II	Very Low	99.988	Station Computer; Automatic Gates, TOM, EFO, Digital Kiosk, TVM , Cashless Card Dispenser, HMI & other Workstations

8. Clause 3.3.9.1: Table 3.6 – Reliability Targets:

AFC Equipment Fitted with Mechanical Assemblies	Minimum MCBF	Minimum MCBJ
Digital Kiosk, TVM & Cashless Card Dispenser	10,000	40,000

9. Clause 3.4.1 Point (vii): Ticket Vending Machine (TVM): Average 8,000 Top up / QR Ticket issued per Ticket Vending Machine (TVM) per day.

10. Clause 3.6.9: Table 3.10- Design Life Period:

Sl. No.	Type of Service	Design Life
1	Central AFC Backoffice System, CCS & BCC, Digital Kiosk, TVM , TR, and Network Equipment.	10 Years (Min)

11. Clause 4.1.1.1 Point (iii): Digital Kiosk & **TVM**.

12. Clause 4.2.3.2: Digital Kiosk & **TVM**

TVM: This equipment shall be installed in the unpaid side of the Ticket Hall (Concourse area) and shall enable the required fare media to be selected and dispensed automatically to patrons on payment of the fare cost. It shall also enable patrons to reload/recharge NCMC purse by Cash and all digital payment such as BHIM, UPI, Paytm etc.

13. Clause 4.2.3.8: All AFC equipment including but not limited to AGs, Digital Kiosk, **TVM**, TOM, TR, Station Computer, Central Computer and wherever applicable shall be equipped with at least four dedicated Security Access Module (SAM) slots subjected to approval of the Employer's Engineer/ Employer to provide security protection functions such as authentication etc.

14. Clause 4.3.1 Point (xix): Maintain the record of QR ticket/ NCMC card stock of TOM, EFO, **TVM**, Digital Kiosk as applicable and coin and cash details of **TVM**. Same information shall be displayed at SCS.

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15. Clause 4.4.4.1: Table 4.2- Indicative Equipment Fault Status:

Equipment	Equipment Warning Messages		
TVM	Bank note cash box nearly full	Bank note cash box full	Contactless fare media Card jam
	QR Coded Ticket container empty	Change container nearly empty	Change Container empty
	Coin jam	Bank note jam	QR Coded ticket jam
	No change mode	Fault status	Tamper detection
	Printer paper roll near empty	Printer paper roll empty	TVM Out of Service

16. Clause 4.4.4.3: (viii) TVM Out of Service Mode. (ix) TVM Out of stock (QR-code ticket), (x) TVM Banknote cash box full.
17. Clause 4.4.6.1 Point (iii): Manage the updating of the fare table data resident in the AG, Digital Kiosk, **TVM** and TOM.
- (iv) Control the functions of AG, Digital Kiosk, **TVM** and TOM; the SC shall enable control of all AFC equipment (putting in-service, taking out of service etc.) without requirement of communication with Central Computer System (CCS)/ Central AFC Backoffice System.
18. Clause 4.4.6.2 Point (i): All transactions performed by the Digital Kiosk, **TVM** and Cashless Card Dispenser.
19. Clause 4.5.9.5 Point (vi): The reader / writer modules used for all AG, TOM, EFO, Digital Kiosk, **TVM**, TR, HHD shall support multiple encryption algorithms such as AES 3K Triple DES.
20. Clause 4.5.13.1 Point (iii): Validation of fare media during station offline conditions (AG is connected to SCS but not connected to CCS) and entry validation of offline tickets issued at TOM/EFO/Digital Kiosk/**TVM**.
21. Clause 4.9.2.1 Point (xii): The data transferred from the devices to the Central AFC Backoffice System shall include, as a minimum, information such as usage of various equipment's commissioning, various transactions, EOD shift summary, Ridership numbers, TOM/EFO shift revenue, Digital Kiosk, **TVM** revenue report & fault reports etc.
22. Clause 4.9.2.9 Point (vi): Shall interface with Acquirer switch to process the NCMC transactions from Gate validators, TOM, Digital Kiosk, **TVM**, EFO and TR including Phase-I stations equipment's.

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23. Clause 4.9.3.1 Point (iv): OCC CCS shall be able to update the QR codes sales from Digital Kiosk, **TVM**, TOM, Web application and Mobile application in the system including Phase-I stations.
24. Clause 4.9.3.2 Point 9: QRTE should manage the inventory of all the QR codes that have been issued through TOM/EFO, Digital Kiosk, **TVM** and website/mobile/WhasApp etc. applications.

Point 10: QRTE should be able to process the QR tickets for TOM/EFO, Digital Kiosk, **TVM** and other sales channels if the transactions are completed offline and the network with station devices are down. The validation of paper QR and Mobile QR tickets can be done online as well as offline.

Point 10: All the QR ticket transactions should be instantly updated in the CCS/ QRTE /Central AFC Backoffice System once these are issued from the TOM/EFO, Digital Kiosk, **TVM** and web/mobile/ Whatsapp application.

25. Clause 5.1.5.1: Table 5.1 - Ticket Dispensing and Renewal:

Function	TOM/EFO	Digital Kiosk	TVM	Cashless Card Dispenser	Smart Card Readers on Automatic Gates	Ticket Reader	HHD
Issue New Smartcard	Yes	N/A	N/A	Yes	N/A	N/A	N/A
Renew/ Upgrade Fares	Yes	Yes	Yes	N/A	N/A	N/A	N/A
Add Value	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Check Credit	Yes	Yes	Yes	N/A	Yes	Yes	Yes
Check Ticket Validity	Yes	Yes	Yes	N/A	Yes	Yes	Yes
View Travel History	Yes	Yes	Yes	N/A	N/A	Yes	Yes
Issue New & Multiple journeys including SJT, RJT & Group QR Coded Ticket	Yes	Yes	Yes	N/A	N/A	N/A	Yes

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26. Clause 5.1.6.1: Table 5.2 – Methods of Payment

Methods of Payment	Selected Banknotes, Coins and Cards in Circulation	TVM	Digital Kiosk	TOM/EFO	Cashless Card Dispenser
1. Banknotes and Coins (INR)					
Banknotes (INR) Issued by Reserve Bank of India	1, 5, 10, 20, 50, 100, 200 and 500	All Banknotes in circulation.	N/A	All Banknotes in circulation.	N/A
Coins Issued by Reserve Bank of India	1, 2, 5, 10 and 20	N/A	N/A	All coins in circulation.	N/A
2. Credit and Debit Cards					
Credit Cards Including Magnetic and Chip/ Pin Varieties.	—	N/A	N/A	All Major Brands in Circulation in India and Internationally	N/A
Debit Cards Including Magnetic and Chip/ Pin Varieties.	—	N/A	N/A	All Major Brands in Circulation in India and Internationally	N/A

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27. Clause 5.1.6.2 Table 5.3 – Change Issued on Payment

Methods of Payment	Selected Banknotes and Coins in Circulation	TVM	Digital Kiosk	TOM/EFO	Cashless Card Dispenser
1. Banknotes and Coins (INR)					
Banknotes Issued by Reserve Bank of India	1, 5, 10, 20, 50, 100, 200 and 500	1, 5, 10, 20, 50, 100, 200 and 500	N/A	All banknotes in circulation.	N/A
Coins Issued by Reserve Bank of India	1, 2, 5, 10 and 20	1, 2, 5, 10 and 20	N/A	All coins in circulation.	N/A
Notes: 1. Shall be possible to dispense change in minimum 4 configurable denominations of banknotes. 2. Shall be possible to dispense change in minimum 3 configurable denominations of Coins. 3. Banknote of any denomination if and when introduced by RBI.					

28. Clause 5.2.6.1: (ii) QR Coded Tickets shall be available for issue from: **(f) TVM**.

29. Clause 5.2.6.4: (iv) Blacklisted tickets for 'add value' functions shall not be accepted at Ticket Office Machines/EFO, HHD, **TVM** and Digital Kiosk.

30. Clause 5.3.6.1: (vii) **Ticket Vending Machine (TVM)**.

31. Clause 5.3.6.2: Each AFC equipment, such as TOM, Digital Kiosk, **TVM** Gates etc. shall be capable of working in standalone mode for a period of 7 days and store minimum 7 Days online data and 30 Days offline data in the event that the local AFC LAN or the Station Computer are inoperative.

32. Clause 5.3.28.1: Table 5.10 – Equipment Construction

Equipment	Location	Type of Housing	IP Rating
Ticket Vending Machine (TVM)	Ticket Hall	Stainless Steel (AISI 304 grade; minimum thickness 2 mm)	IP 54

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33. Clause 6.8.3.2: Point (i); 3:- Digital Kiosk & TVM.

34. Clause 7.7.7: Application of Penalties:

S. No.	Measurement	Definition	Applicable Penalty
3	Unavailability of service(s) at Digital Kiosk's/ TVM 's/Cashless Card Dispenser/TOM's/EFO's to passenger or operator due to failure of all Digital Kiosk's/ TVM 's/Cashless Card Dispenser's /TOM's/EFO's in a station during revenue services.	Any failure (hardware/software/ interface/ power) leading to unavailability of service(s) to passenger or operator.	a. ₹ 15000 for per failure per station for first hour. b. Additional ₹ 2000 for every subsequent hour per station subject to a maximum penalty of ₹ 50000 in a Business- day per station. c. Additional ₹ 100000 for each business day if the failure extends beyond the day on which it was reported.
4	Unavailability of service(s) at any of the Digital Kiosk/ TVM / Cashless Card Dispenser /TOM/EFO to passenger or operator due to failure of a Digital Kiosk/ TVM / Cashless Card Dispenser/TOM/EFO in a station during revenue services.	Any failure (hardware/software/ interface/power) leading to unavailability of service(s) to passenger or operator.	a. No penalty for first forty-five minutes (0- 45 mins) after reporting. b. Additional ₹ 2000 per Digital Kiosk/ TVM /Cashless Card Dispenser/TOM/EFO for every subsequent hour subjected to a maximum penalty of ₹10000 per Digital Kiosk/ TVM /Cashless Card Dispenser/TOM/EFO in a Business- day. c. Additional ₹ 20000 per Digital Kiosk/ TVM /Cashless Card Dispenser/TOM/EFO for each business day if the failure extends beyond the day on which it was reported.

Section VII-A: General Specifications

35. Clause 7.16.12: Point (a) Prior to placement of the equipment in revenue service, tickets will be loaded by the Employer into the TOM, **TVM** and Digital Kiosk.

36. Clause 11.4.1: Table 11.1 – Training of Employer's Personnel

SL. NO	Description	Total Period (Trainee Man Months)
1	Design of Gates, TOM, TVM , Digital Kiosk, QR System, HHD	6



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APPENDIX – C– Minimum BOQ

Nagpur Metro Rail Project Phase-II AFC System - BOQ																		
Sl.NO.	Station	Elevated or at grade	Entry	Exit	Wide	Swing Gate	TOM	TVM	Digital Kiosk	EFO	HHD	SC	TR	Cashless Card Dispenser	Central AFC Backoffice System/CCS	WS		
Kanhan River to Automotive Square																		
1	Kanhan River	Elevated	2	3	1	1	2	1	2	1	1	1	2	1				
2	Golf Club		4	6	2	2	4	1	4	2	2	1	4	1				
3	Dragon Palace		2	3	1	1	2	1	2	1	1	1	2	1				
4	Kamptee Municipal Council		2	3	1	1	2	1	2	1	1	1	2	1				
5	Kamptee Police Station		5	7	2	2	4	1	4	2	2	1	4	1				
6	Cantonement		8	7	2	2	6	1	4	2	2	1	4	1				
7	Lekha Nagar		4	6	2	2	4	1	4	2	2	1	4	1				
8	Lok Vihar		4	6	2	2	4	1	4	2	2	1	4	1				
9	Khairi Fata		2	3	1	1	2	1	2	1	1	1	2	1				
10	All India Radio		4	6	2	2	4	1	4	2	2	1	4	1				
11	Khasara Fata		4	6	2	2	4	1	4	2	2	1	4	1				
12	Pili Nadi		4	6	2	2	4	1	4	2	2	1	4	1				
MIHAN to MIDC ESR																		
13	Eco Park	At grade	2	3	1	1	3	1	2	1	1	1	2	1				
14	National Cancer Institute Metro Station		2	3	1	1	3	1	2	1	1	1	2	1				
15	Ashokvan	Elevated	2	2	1	1	3	1	2	1	1	1	2	1				
16	Dongragaon		4	4	2	2	8	1	4	2	2	1	4	1				
17	Mohgaon		4	4	2	2	6	1	4	2	2	1	4	1				

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18	Meghdoot CIDCO		4	4	2	2	6	1	4	2	2	1	4	1		
19	Butibori Police Station		2	3	1	1	3	1	2	1	1	1	2	1		
20	MHADA Colony		4	4	2	2	8	1	4	2	2	1	4	1		
21	MIDC KEC		4	4	2	2	6	1	4	2	2	1	4	1		
22	MIDC ESR		4	4	2	2	6	1	4	2	2	1	4	1		
Transport Nagar to Prajapati Nagar																
23	Transport Nagar	Elevated	4	6	2	2	4	1	4	2	2	1	4	1		
24	Kapsi Khurd		4	6	2	2	4	1	4	2	2	1	4	1		
25	Pardi		4	4	2	2	6	1	4	2	2	1	4	1		
Lokmanya Nagar to Hingna																
26	Hingna Mount View	Elevated	3	4	1	1	3	1	2	1	1	1	2	1		
27	Rajiv Nagar		4	5	2	2	6	1	4	2	2	1	4	1		
28	Wanadongri		2	3	1	1	3	1	2	1	1	1	2	1		
29	APMC		2	3	1	1	3	1	2	1	1	1	2	1		
30	Raipur		2	3	1	1	3	1	2	1	1	1	2	1		
31	Hingna Bus Station		4	6	2	2	6	1	4	2	2	1	4	1		
32	Hingna		4	5	1	1	3	1	3	1	1	1	2	1		
TOTAL			110	142	51	51	135	32	103	51	51	32	102	32		
1	OCC		0	0	0	0	0	0	0	0	0	0	0	0	1 set	10
2	BOCC		0	0	0	0	0	0	0	0	0	0	0	0	1 set	2
3	SW TESTING & DEVELOPMENT CENTRE		1	1	1	0	2	1	1	2	1	2	1	1	1 set	2
4	SPARE		12	15	6	6	14	4	11	6	6	4	10	3	1 set	2
GRAND TOTAL			123	158	58	57	151	37	115	59	58	38	113	36		16

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Note:

1. Acronyms

Acronym	Description	Acronym	Description
Central AFC Backoffice System / CCS	Central Computer System	TR	Ticket Reader
TOM	Ticket Office Machine	SC	Station Computer
Digital Kiosk	Digital Kiosk	WS	Workstation
Entry	Automatic Gate Entry	CCM	Cash Counting Machine (Bank Note Counting & Coin Counting Machines)
Wide	Bidirectional Automatic Wide Gate		
Exit	Automatic Gate Exit		

2. Contractor shall provide one no of Coin Counting Machine (CCM) per station, one no at depot and 10% additional quantity as spares (of total supplied quantity).

3. Contractor shall provide one no of Bank Note Counting Machine (BNCM) per station, one no. at depot and 10% additional quantity as spares (of total supplied quantity).

4. Contractor shall provide Emergency Switch (Master) at each Station SCR, Emergency Switch (Slave) at each Station EFO, Two no of Emergency Switch (Master) at depot and 10% additional quantity as spares (of total supplied quantity).

5. Contractor shall provide Fix barrier and Pole barrier in line with Automatic Gate (AG) array (as per requirement), to prevent passenger movement from paid to unpaid area and vice-versa.

6. In case the supplies of spares as mentioned above are made out in terms of percentage, the fractions shall lead to the next integer value.

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APPENDIX – D – List of Spares, Consumable & Special tools, Testing & Measuring Instruments

List of Spares:

List of Spare		
Sr. No.	Equipment/Item	Spare Modules
		Total Quantity
1	Each type of Automatic Gate (complete modules)	10% of total installed quantity
2	TOM (complete module) including Counter Communication System.	10% of total installed quantity
3	EFO (complete module) including Counter Communication System.	10% of total installed quantity
4	Digital Kiosk (complete module)	10% of total installed quantity
5	Ticket Vending Machines (TVM)	10% of total installed quantity
6	TR (complete module)	10% of total installed quantity
7	Station Computer (Complete Module)	10% of total installed quantity
8	HHD (Complete Module)	10% of total installed quantity
9	Cashless Card Dispenser	10% of total installed quantity
10	Work Station (complete module)	10% of total installed quantity
11	Each type of Firewall (complete module)	10% of total installed quantity
12	Each type of Network Switch (complete modules)	10% of total installed quantity
13	Cables	
	Each type of installed Power, Earthing & Emergency Cable	10% of total installed quantity
14	Network Cables and Accessories	
	LAN Cable	10% of total installed quantity
	OFC	10% of total installed quantity

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	All other Network Accessories/Components	10% of total installed quantity
15	SAM	10% of total installed quantity
16	Each type of Electrical Cabinet and Isolator (complete modules)	10% of total installed quantity
17	Each type of Network Switch Rack (complete modules)	10% of total installed quantity
18	Emergency Switch (Master)	10% of total installed quantity
19	Emergency Switch (Slave)	10% of total installed quantity
20	Any other required equipment/ Accessories.	10% of total installed quantity
21	Keyboards, Keypads, Mouse (AG, TOM, EFO, SC, Workstations etc.)	10% of total installed quantity

List of Consumable:

List of Consumable		
Sr. No.	Equipment/Item	Duration
1	Thermal Printer Paper rolls for both QR Ticket & Receipt (TOM/EFO/Digital Kiosk/ TVM /Cashless Card Dispenser/HHD etc.)	Till completions of CAMC
2	Deleted	
3	Printer Cartridge, Toner, Thermal Printer Head	
4	Stickers/ Labelling/ Facia (Automatic Gate, Digital Kiosk, TVM , Cashless Card Dispenser, TR, Electrical Cabinet, Network Switch Rack) and other if required.	
5	Other Consumables like lugs, ferrules, connectors, fuse etc.	

Note:

- 1) Contractor shall also give the unit price of each module to be supplied under Spare & Consumable.



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- 2) In case the supplies are made out in terms of percentage, the fractions shall lead to the next integer value.
- 3) All service related to supply shall be additionally, over and above, shall be as below:
 - a) Installation and Site Testing- 15%
 - b) System Acceptance Testing, Integrated Testing and Commissioning and Operational Acceptance- 10%



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APPENDIX – F – Indicative Specifications of Servers & Workstations

H: Indicative Technical Specification of Station Computer System (SCS):

Sr. No.	Parameter	Specifications
1	CPU	Latest Intel Xeon processor, 6 Core
2	Memory	32 GB RAM with 32 GB Expandability.
3	Monitor	Min 32-inch, LCD/LED, 1920x1080 resolution, Height-adjustable, preferably curved, Integrated Speaker
4	Hard Disk	Min 500GB SSD, high-availability, hardware RAID-1, hot-swap
5	Ports	Minimum 4 USB Ports (including 2 USB ports in the front)
		1 VGA/HDMI out
		1 Serial I/O Ports
		1 Line-in & 1 Line-out ports
6	Keyboard	104 Keys, heavy-duty normal English keyboard, having key life of 20 million keystrokes or more, USB
7	Mouse	USB Optical scroll mouse with Pad
8	Power supply	250W. minimum 80 PLUS Platinum
9	Network Interface	2x 1GbE ports standard, 1x 1GbE dedicated management port (as per design requirement)
11	Operating System	Microsoft, Linux, Red Hat, etc., with license and recovery CD of OEM. OS should support enterprise-level applications and not have any limitation which will affect the operation with full load capacity, including future expansion. Licensed MS Office and .pdf file reader software for view and edit SCS reports.
12	Data Base	SQL, Oracle, etc., with license and recovery CD of OEM. OS should support enterprise-level applications and not have any limitation which will affect the operation with full load capacity, including future expansion.
13	SCS Printer	Laser printer, A4, minimum 20 ppm, connectivity-USB, memory-64mb, duty cycle- 10,000 pages/month

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Appendix - 05

PCC- Annexure-IX-C

Key Dates / Mile Stone

Table: Summary of Sections (KEY DATES / ACCESS DATES)

The Contractor will be required to achieve the following Key Dates (KD) to be calculated from the commencement date of Work

[All numbers refer to weeks from Commencement Dates of the Works]

Key Dates	Description	Time to Achieve (in Weeks)					
		R1A ¹	R2A ¹	R3A	R4A	R2A ²	R1A ²
KD1	Signing of Contract Agreement	D+4	D+4	D+4	D+4	D+4	D+4
KD2	Submission of Preliminary design including Plan & Interface design	D+6	D+8	D+15	D+15	D+15	D+15
KD3	Submission of Detail/ Final design & Final drawings for the accepted Final Design for AFC systems	D+12	D+12	D+30	D+30	D+30	D+30
KD4	Obtain Consent of Employer's Engineer on Detail/ Final design submission & Final drawings for the accepted Final Design for AFC systems	D+14	D+20	D+86	D+73	D+96	D+138
KD6	Delivery of AFC Equipment of NMRP Phase-II including Spare.	D+26	D+36	D+98	D+85	D+108	D+150

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KD7	Completion of Installation and Site Testing of AFC Equipment	D+30	D+48	D+110	D+91	D+120	D+166
KD8	Completion of SAT, Integrated Testing and Commissioning required for Revenue Operation	D+32	D+50	D+120	D+108	D+130	D+180
KD9	Completion of Contract Excluding CAMC	On Completion of DLP of complete works					

D= Date of commencement of work.

The Contractor shall commence the Works on the date specified in the Letter of Acceptance or if no date is specified in the Letter of Acceptance, on the date specified in the Notice to Proceed.

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 Employer's Representative
2. The achievement of a Key Date shall require completion of all the works specified for achievement of the Key Date.
3. All Key Dates are Minor key dates except Key Date Nos. 8, which is Major Key Dates.

SCHEDULE OF ACCESS DATES

Access Dates

- "Access Dates" are dates that are to be achieved by other Designated Contractors and which are considered to be essential to the successful completion of the Contract to the original planned schedule.
- The Contractor will require access to information as well as to various locations at stations / track / viaduct / RSS, etc., in stages, in order to plan his activities for time-bound completion of his obligations under the Contract.

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- The dates on which such access becomes available are indicated in terms of the time period reckoned from the Commencement of the Works, and shall mean guaranteed access by the midnight of the last day of the week mentioned. The access shall be provided by the respective Designated Contractors.
- The tentative Access Dates including description have been indicated in the schedule of Access Dates in Table below:

1. Schedule of access Dates for Reach 1A¹ section- Eco Park (At Grade) to Metro City Station

AD No.	Access Date	R1A ¹
AD1	SER&TER/ SCR/ TOM/ EFO with cable Containment (Primary)	30-08-2025
AD2	SER&TER/ SCR/ TOM/ EFO with cable Containment (Secondary)	21-09-2025
AD3	Concourse Access with Raceway	30-09-2025
AD4	Electrical Power & AC for Testing of Various Systems works like Lifts, Escalators, Signalling, AFC etc	31-12-2025

2. Schedule of access Dates for Reach 2A¹ section- Pili Nadi to Lekha Nagar (Elevated)

AD No.	Access Date	R2A ¹
AD1	SER&TER/ SCR/ TOM/ EFO with cable Containment (Primary)	31-03-2026
AD2	SER&TER/ SCR/ TOM/ EFO with cable Containment (Secondary)	15-05-2026
AD3	Concourse Access with Raceway	15-06-2026



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AD4	Electrical Power & AC for Testing of Various Systems works like Lifts, Escalators, Signalling, AFC etc	31-07-2026
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3. Schedule of access Dates for Reach 3A section- Hingna Mount View to Hingna (Elevated)

AD No.	Access Date	R3A
AD1	SER&TER/ SCR/ TOM/ EFO with cable Containment (Primary)	30-08-2026
AD2	SER&TER/ SCR/ TOM/ EFO with cable Containment (Secondary)	30-09-2026
AD3	Concourse Access with Raceway	30-11-2026
AD4	Electrical Power & AC for Testing of Various Systems works like Lifts, Escalators, Signalling, AFC etc	31-12-2026

4. Schedule of access Dates for Reach 4A section- Pardi to transport Nagar (Elevated)

AD No.	Access Date	R4A
AD1	SER&TER/ SCR/ TOM/ EFO with cable Containment (Primary)	30-06-2026
AD2	SER&TER/ SCR/ TOM/ EFO with cable Containment (Secondary)	30-07-2026
AD3	Concourse Access with Raceway	30-09-2026
AD4	Electrical Power & AC for Testing of Various Systems works like Lifts, Escalators, Signalling, AFC etc	15-10-2026



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5. Schedule of access Dates for Reach 1A² section- Ashokvan to MIDC ESR (Elevated)

AD No.	Access Date	R1A ²
AD1	SER&TER/ SCR/ TOM/ EFO with cable Containment (Primary)	30-05-2027
AD2	SER&TER/ SCR/ TOM/ EFO with cable Containment (Secondary)	30-06-2027
AD3	Concourse Access with Raceway	30-07-2027
AD4	Electrical Power & AC for Testing of Various Systems works like Lifts, Escalators, Signalling, AFC etc	30-09-2027

6. Schedule of access Dates for Reach 2A² section- Cantonment to Kanhan River (Elevated)

AD No.	Access Date	R2A ²
AD1	SER&TER/ SCR/ TOM/ EFO with cable Containment (Primary)	30-11-2026
AD2	SER&TER/ SCR/ TOM/ EFO with cable Containment (Secondary)	15-01-2027
AD3	Concourse Access with Raceway	28-02-2027
AD4	Electrical Power & AC for Testing of Various Systems works like Lifts, Escalators, Signalling, AFC etc	31-03-2027



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Notes regarding Changes in Key Dates & Access Dates

1. The Key Dates and Access Dates indicated above have been identified on the basis of discussions with various groups and agencies involved in the Project. Special attention is drawn to the following facts with respect to the possible changes in the Key Dates and Access Dates.
2. It is essential that the Contractor shall achieve the identified work by the specified Key Date mentioned against it, failing which Liquidated Damages shall become leviable as set out in the Contract.
3. The Access Dates are dependent on the other agencies e.g. station building contractors, viaduct contractors, depot contractor, Trackwork Contractor etc. involved in the project. The Contractor shall interface and maintain a close liason with other agencies for timely availability of the access. In case the Contractor finds that there is slippage and the likely Access Dates may not be adhered to, the Contractor shall inform the Employer in well advance for the likely delays in access to site.
4. The Employer will, on his part, make all efforts to provide the Contractor with access to information as well as to various locations at stations/track/viaduct in stages, in order to plan/execute his activities for time-bound completion of his obligations under the Contract, as per the Access Dates mentioned above. If, however, due to any reasons, the Employer is not in a position to provide access or shared access, as per the stated Access Dates, the Employer, in these circumstances, will inform the Contractor, in writing, about the proposed revised Access Dates, at least 8 weeks before the scheduled Access Date. The Contractor shall suitably make necessary changes in his Work Program and shall make all out efforts so that, irrespective of the revised Access Dates, the concerned Key Dates are adhered to.
5. Where Access Dates overlap, the Contractor shall ensure that there are sufficient resources to meet the Key Dates.



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Annexure-1

GS- APPENDIX: 5 (Revised)

SITE MOBILITY AND SITE OFFICE FOR EMPLOYER

1. FACILITIES FOR THE EMPLOYER'S REPRESENTATIVE

1.1 General

- 1.1.1 Site Offices: The Contractor shall provide the project site office seating capacity approximate 20 person includes one good meeting room which will also be used by employer closed to Metro line for ease of site work monitoring and material storage throughout the course of the Works and for so long a period of time during the defects liability period.
- 1.1.2 Materials used for the construction of the offices shall be new and of good quality. Materials shall be chosen such that the buildings when erected shall give good temperature and sound insulation, and when combined with the heating and air condition equipment installed by Contractor will enable interior temperatures to be maintained at within a range of 20-24°C at all times. But external and internal walls shall be soundproof.
- 1.1.3 All buildings shall be supplied with running water to the kitchens and washrooms. The toilets may use raw water for flushing, shall be equipped with water closets and sitting type stools and shall be adequately ventilated through the ceiling. The Contractor shall also arrange for the constant and hygienic disposal of all effluent, sewage and rubbish from the buildings.
- 1.1.4 All buildings shall be supplied with electricity 240V 50Hz that shall be distributed to each room in accordance with the Regulations. Lighting and electrical power points shall be provided to each room.
- 1.1.5 Firefighting equipment shall be provided in accordance with the recommendations of the City Fire Brigade.
- 1.1.6 The Contractor shall provide, erect and maintain appropriate name boards as specified for each of the offices. The wording on each name board and its location shall be agreed by the Employer's Representative before it is erected.
- 1.1.7 The building shall be provided with a continuous water supply and drainage to Kitchen, Washroom and Toilets. The Toilets shall be equipped with low level suites and be

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adequately ventilated through the ceiling.

- 1.1.8 The Contractor shall provide protective clothing and safety equipment for 10 persons, comprising, as a minimum – Safety Helmets Safety Harness, Steel-toed construction boots (sizes to be notified), Day-Glo waistcoat, Industrial safety goggles, Industrial gloves, Breathing Masks and Filters, Ear protectors, Heavy weight suits (sizes to be notified), Lamps (with batteries).
- 1.1.9 The Contractor shall arrange for upkeep, service and security of the offices and compound. These to be thoroughly cleaned and for rubbish and waste to be removed at least once per day.
- 1.1.10 The Contractor shall maintain the running cost of the office including electricity, wifi, telephone communication.
- 1.1.11 The total price for providing a site office including all other stated facilities as above, is deemed to be included in the quoted price by the bidder in the Financial bid. No separate payment or claims shall be considered by the employer.
- 1.1.12 Site mobility & site office for employer is applicable up to the end of DLP period.

1.2 Road Transport

- 1.2.1 The Contractor shall provide 1 (One) number of Inova crista model/equivalent SUV and 1 (One) number of Dzire/Sedan model/ equivalent having AC facility for the use of the Employer within 30 days from the date of commencement of the work for the proper Management & supervision of construction work till completion of DLP. The Contractor will bear all expenses connected with the operation and the maintenance of this vehicle, including driver's wages, overtime and other benefits, cost of the fuel, lubricant, repairs and maintenance, third party insurance, any other related expenses etc. to the satisfaction of the Engineer. The vehicle shall be replaced with a new vehicle during breakdown time, failing which the Employer will hire the vehicle at the risk and cost of the Contractor.
- 1.2.2 The vehicles shall not be more than two years old (at the time of deployment) and should have taxi permit and delivered and maintained by the Contractor in good roadworthy condition including daily cleaning. All vehicles shall be air-conditioned.
- 1.2.3 The Contractor shall employ and make available competent drivers fully licensed to operate the vehicles as and when required by the Employer. The Contractor shall replace drivers at the request of the Engineer/Employer. Alternate arrangement of drivers should be ensured by the contractor in case of emergency or excessive working hours due to demands of work.
- 1.2.4 The vehicles shall be licensed and insured for use on the public highway and shall have

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comprehensive insurance cover for any qualified driver authorised by the Engineer/ Employer together with any authorised passengers and the carriage of goods or samples. All the relevant and valid documents of the vehicle should any time be available with the driver and can be asked to show by the Employer anytime.

- 1.2.5** The Contractor shall provide fuel, oil for running of each vehicle for 4000 kms monthly and ensure maintenance in conformity with the vehicle manufacturer's recommendations and all relevant toll and parking charges incurred in connection with the Works. The vehicle shall be provided for 12 hours shift (day or night) as required by the Employer.
- 1.2.6** A suitable replacement shall be provided by the contractor for vehicle out of service for more than 24 hours. If the contractor at any time fails to provide vehicles) or substitute vehicle(s) as specified, an amount of Rs.3000 per day for each vehicle (that the Contractor failed to provide) will be recovered from the running bill of Contractor.
- 1.2.7** 40% of the apportioned payment under this Milestone for Provision of Site Office and 50% of the apportioned payment under this milestone for provision of Employers Transport facility. 10% of the apportioned payment under this Milestone for Provision of Furniture at Site office as approved by employer. The payment of 90% shall be made on monthly basis starting from 3 months after the Commencement Date as per this Milestone shall be equally spread over 41 months for the purpose of payment. Balance 10% will be released up to completion of DLP.