



**BEML LIMITED**  
**BENGALURU**  
**R & D CENTER**

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**MRS1 Project**

**Procurement Technical Specification  
of Grab Pole, Grab Rail and Draught Screen  
Pole**

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## 1. Introduction

### 1.1. General

This Procurement Technical specification (PTS) specifies the technical requirements of Grab Poles, Grab Rails and Draught Screen Poles to be fitted in the interiors of DM, M & T cars, to be supplied under the 'MRS1' contract for Mumbai Metro Line-2 & 7.

BEML will carry out all required works and activities as Contractor to the Employer for MRS1 project, while the subcontractor shall be responsible for all works required in this PTS with regard to Grab Poles, Grab Rails and Draught Screen Poles and shall be responsible for supporting the BEML activities as contractor for MRS1 project.

The scope of work includes all items of work which may be required to meet the performance requirements, reliable and efficient operation of trains and meeting the best international practices even if not specifically mentioned in this PTS.

### 1.2. Train Composition

The rake formation shall generally be as follows:

3 Car unit formation : DM – T – M –  
6 Car Train formation: DM –T–M – M – T – DM

In case of 8-car formation (if required):

2 Car train formation : – T – M –  
8 Car Train formation: DM – T – M – T – M – M – T – DM

where,

DM : Driving Motor Car

T : Trailer Car with pantograph

M : Non -Driving Motor Car

### 1.3. Climatic & Environmental Conditions

The Metro cars shall operate reliably and safely under the climatic and environmental conditions of Mumbai. Accordingly, the Grab Poles, Grab Rails and Draught Screen Poles shall be designed to operate with satisfactory performance under the following conditions.

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Description	Limiting Values
Maximum ambient temperature (See note below)	36 °C
Minimum ambient temperature	14.3 °C
Humidity	≥95% RH
Rainfall	The annual precipitation is 2,078 mm with 34% (709 mm) falling in the month of July.
Atmosphere during hot season	Extremely dusty including bird feathers
Maximum wind speed	150 Km/hr
Vibration & Shocks	The sub-systems & their mounting arrangements shall be designed to withstand satisfactorily the vibration and shocks encountered in service as specified in IEC 61373 and IEC 60571.
SO2 level in atmosphere	80 – 120 mg/m <sup>3</sup>
Suspended particulate matter in atmosphere	360 – 540 mg/m <sup>3</sup>
Flood Proofing	The traction sub-systems mounted on the under-frame will be designed to permit propulsion of the train at 10 kmph through water up to a depth of 50mm above rail level. Traction sub-systems shall be made splash proof in accordance with International Standards.
Life	The Metro car is designed for min. 35 years of life. Accordingly, the subject items & accessories shall also not deteriorate in their performance for 35 years.

**Note:**

- 1) The temperature of the metal surfaces of the vehicles when exposed directly to the sun, for long periods of time, may be assumed to rise to 70 °C.
- 2) Any moisture condensation shall not lead to any malfunction or failure.
- 3) Adequate margin shall specially be built into the design particularly to take care of the higher ambient temperatures, high humidity, dusty and corrosive conditions, etc. prevailing in Mumbai area.

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#### 1.4. Vehicle Performance Requirements

The vehicle performance requirements with fully loaded train and tangent track are as per the following table.

Item		All Corridors
Safe speed	With inflated secondary suspension	90 kmph
	With deflated secondary suspension	80 kmph
Maximum operational speed	With inflated secondary suspension	80 kmph
	With deflated secondary suspension	70 kmph
Minimum Design Average Acceleration rate for fully loaded (AW3) train on level tangent track shall be as under: 0 kmph to 40 kmph 0 kmph to 60 kmph 0 kmph to 80 kmph		1.0 m/s <sup>2</sup> 0.75 m/s <sup>2</sup> 0.40 m/s <sup>2</sup>
Minimum Operational Average Acceleration rate for AW2 loaded train on level tangent track shall be as under: 0 kmph to 35 kmph 0 kmph to 60 kmph 0 kmph to 80 kmph		1.20 m/s <sup>2</sup> 0.80 m/s <sup>2</sup> 0.45 m/s <sup>2</sup>
Average Service braking rate from 80 kmph to standstill for fully loaded(AW3) train on level tangent track.		1.0 m/s <sup>2</sup>
Average Service braking rate from 80 kmph to standstill for AW2 train on level tangent track.		1.1 m/s <sup>2</sup>
Average Emergency braking rate from 80 kmph to 0 kmph for fully loaded trains on level tangent track		1.3 m/s <sup>2</sup>
Jerk rate (Maximum)		0.75 m/s <sup>3</sup>
Annual running distance of one train (for design purpose)		150,000 km
Note : The specified average minimum acceleration shall be the finally achieved values inclusive of the specified jerk rate.		

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### 1.5. Track structure Parameters

The MRS1 cars will operate with the track parameters as specified in the following table:

Description	Elevated and At-grade Corridor		Underground Corridor
	Ballasted	Ballast less (DFF)	Ballast less (DFF)
Track Laying Gauge	1435 mm		
Rail Type (Main Line & Depot)	60 EI (UIC 60) 880/HH	60 EI (UIC 60) 1080/HH	60 EI (UIC 60) 1080/HH
Rail Profile	UIC 861-3		
Inclination Of Rail	1 in 20		
Sleeper Spacing (Main line)	600 mm ± 10mm	600 mm ± 10mm	700 mm ± 10mm
Sleeper Spacing (Depot)	650 mm ± 10mm	Not applicable	
Ballast Cushion Depth(Main line)	300mm	Not applicable	
Ballast Cushion Depth (Depot)	250mm	Not applicable	
Standard Rail Length	13m and 18m	18m	
Rail Panel Lengths	Longer than 200m		
Minimum Radius of Curvature	200m-Underground 110m-Elevated 100m-Depot		
Minimum Turn out Radius.- (Main line)	1 in 9 - 300m radius 1 in 7- 190m radius		
Minimum Turn Out Radius Depot	1 in 7 - 190m radius		
Maximum Cant Permissible	110 mm		
Maximum Cant Desirable	110 mm		
Maximum Cant Deficiency Permissible	85mm		
Maximum Cant Deficiency Desirable	85 mm		
Maximum Permissible Cant Gradient	1 in 440		
Maximum Desirable Cant Gradient	1 in 720		
Turn-out Speed : Turnout (1 in 9) R-300	45 km/h	45 km/h	40 km/h
Turn-out Speed : Scissors (1 in 9) R-300	45 km/h	45 km/h	40 km/h
Turn-out Speed : In Depots (1 in 7) R-190	35 km/h	35 km/h	25 km/h
Turn-out Speed : Turnout (1 in 7) R-190	35 km/h	35 km/h	25 km/h
Turn-out Speed : Turnout(1 in 12) R-410	50 km/h	50 km/h	50 km/h

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Turn-out Speed : Turnout(1 in 12) R-410	50 km/h	50 km/h	50 km/h
Turn-out Speed : Turnout (1 in 8.5) R-218	30 km/h	30 km/h	30 km/h
Turn-out Speed : Turnout(1 in 8.5) R-218	30 km/h	30 km/h	30 km/h
Maximum Gradient Main Line	4%		
Maximum Gradient Depot Connection	4%		
Minimum vertical curve radius of curvature	1500m		

### 1.6. Current Collection System

System Particulars	For all sections and depot
Supply Voltage System	25kV AC single phase 50Hz
Current Collection	Through Pantograph

### 1.7. Signalling System

Item	Description
Train Control System	CBTC based On board Continuous Automatic Train Control system (CATC) consisting of i) Automatic Train Protection ii) Automatic Train Operation (ATO) iii) Automatic Train Super-vision (ATS) iv) Attended/Unattended train operation (GoA2/GoA3/GoA4)
Train Control mode	i) Automatic mode ii) Coded Manual modes iii) Restricted Manual mode iv) Run on Sight mode v) Cut-out mode vi) UTO vii) Standby

### 1.8. Principal Notional Vehicle Dimensions/ Leading Particulars

Description		Dimension
Gauge		1,435 mm
Maximum Length over body(including end-fairings)	DM car	22,010 mm
	T and M cars	22,010 mm
Maximum Length over couplers for all cars		23,000 mm
Maximum Width over Body		3,200 mm

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Minimum Passenger Saloon Headroom		2,050 mm
Locked down pantograph height for 25kV AC cars from rail level at Car Centre Line		4,048 mm
Maximum Floor height above rail level of any unloaded vehicle		1,130 mm
Minimum Floor height above rail level of fully loaded vehicle		1,100 mm
Maximum height of coupler above rail level for unloaded vehicle		815 mm
Minimum height of coupler above rail level for fully loaded vehicle		740 mm
Bogie Wheel Base	Maximum	2400 mm
	Minimum	2200 mm
Distance between bogie centres	Maximum	15,100 mm
	Minimum	14,400 mm
Wheel diameters	New	860 mm
	Fully worn	780 mm
Maximum axle load		17 Tonne (including all tolerances as per IEC 1133-1992)

## 2. Definitions

The following definitions are applicable to the PTS.

- **“Employer”** means Delhi Metro Rail Corporation Limited (DMRC), its legal successors and assignees.
- **“Subcontractor”** means the Supplier who supplies the required Grab Poles, Grab Rails and Draught Screen Poles for MRS1 project.
- **“Contractor”** means the persons or person appointed by the Employer to undertake the execution of the works for MRS1 project.
- **“Contract”** means the contract between Subcontractor and BEML in relation to the supply of Grab Poles, Grab Rails and Draught Screen Poles for MRS1 project.
- **“Engineer”** means any person nominated or appointed from time to time by the Employer to act as the Engineer for the purposes of the Contract and notified as such in writing to the Contractor.
- **“Engineer's Representative”** means any Assistant of the Employer appointed from time to time by the Employer.
- **“BEML”** means the Contractor to procure the Grab Poles, Grab Rails and Draught Screen Poles for MRS1 project cars.

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### 3. Qualification Criteria

- (i) Sub-contractor shall be an Original Equipment Manufacturer (OEM) of Stainless Steel Grab Poles and Grab Rails for Railway Metro Rolling stock, having experience in design, manufacturing, testing and commissioning.
- (ii) The sub-contractor shall have manufactured and supplied Stainless Steel Grab poles and Grab Rails and such supplies should have been in use and have established their satisfactory performance and reliability on at least three Mass Rapid Transit Systems in revenue service over a period of three years or more (in each MRTS) either outside the country of origin in three different countries or in an MRTS in India. Satisfactory Revenue service performance certificates for a period of 3 years or more from end users/ Metro Operators for the above shall be submitted along with the technical offer.
- (iii) Indian OEMs of Stainless Steel Grab Poles and Grab Rails, not meeting the above criteria at (ii) but have manufactured and supplied similar Stainless steel grab poles and rails to any of the Indian Metro projects may submit complete details of the type of supplies made, technical specifications, manufacturing methods, process details, type tests carried out, list of parts supplied etc for BEML/DMRC review and consideration. However, BEML/DMRC decision on sub-contractor's proposal shall be final and binding
- (iv) Along with the technical offer, the subcontractor shall submit the filled Vendor approval form along with all the required supporting documents for obtaining the vendor approval for Grab pole and Grab Rail from DMRC. Selection of Vendor is subject to DMRC approval.
- (v) The firm should undertake to provide the support during DLP period either by themselves or through sister company or a partner in India. The firm shall submit detailed proposal in this regard along with the technical offer.
- (vi) The firm should give an undertaking to supply spares for a minimum period of 10 years from the date of last car supplied by BEML under this contract.

### 4. Design Criteria

The Stainless Steel Grab Pole, Grab Rail and Draught Screen Pole proposed by the sub-contractor shall comply with the following Design criteria.

- (i) Stainless steel grab poles and rails shall be provided in the standing areas of the saloon for the comfort and safety of standing passengers.
- (ii) The draught screen pole shall be formed from tubular metal grab poles.
- (iii) Grab poles shall have not less than three vertical arms for increased accessibility. However, space between the vertical arms shall be limited to ensure that no entrapment of any part of the body is possible.
- (iv) Sufficient margin shall be available in the top guide so as to ensure that under extreme loading conditions, the grab poles shall not become free.

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- (v) The Grab poles and rails in the DM and T/M car shall be provided to cover maximum number of standing passengers. As a minimum, 3 rows of longitudinal bars shall be provided through out the saloon. The bars shall be suitably contoured in the door area to facilitate easy flow of passengers.
- (vi) Additional Stainless steel grab rails shall also be provided at the entrance (both sides) of each door and also near gangway.
- (vii) Grab rails and stanchions in saloon area shall be brush finished.
- (viii) Grab rails shall be so designed that they do not hinder passengers view of door/PEACU (Passenger Emergency Alarm) device in CCTV.

## 5. Technical Requirements

- (i) The subcontractor shall meet the requirements for Stainless steel Grab Poles, Grab Rails and Draught Screen Poles as per Design Criteria at Section-4 above, as a minimum.
- (ii) All components of the grab pole, grab rail and draught screen pole assembly shall be made of Austenitic stainless steel to grade SUS 304.
- (iii) All grab rails are connected with the grab poles by cover joint by two screw fasteners. The cover joint is designed to slide over the grab rail. Hence, the grab rails can be easily removed and fitted again during maintenance. The screw fasteners shall be at top of the grab rail so that the screw head shall be hidden from passenger's normal sight.
- (iv) The grab poles and rails shall suffer no permanent deformation when subject to loading conditions arising in service, in accordance with UIC 566 / EN 12663. The mounting of grab poles considers the movement of floating floor for passenger load of 10 passenger/m<sup>2</sup> and shall ensure free movement in the worst possible scenario.
- (v) The grab pole, grab rail and draught screen pole assemblies shall be subjected to "uniformly distributed load" to measure the deflection and maximum load the assembly can withstand. A maximum load of 4125 N (equally distributed on the three arm i.e approx. 1375 N on each arm) for the vertical three arm assembly, 1125 N for every one meter length of the grab rail assembly and 2625N for draught screen pole shall be achieved.

### 5.1. Pipes

- i. All pipes for the grab pole, grab rail and draught screen pole assemblies shall be made of ERW stainless steel pipe to grade SUS 304 / TP 304 of ASTM A 269.
- ii. The pipes shall be straight without any dents and wrinkles. Both ends shall be at right angles to the pipe axis.
- iii. The inside and outside surfaces of the pipe shall be well finished and shall be free from defects detrimental to the usage.

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- iv. The quality and finish of the pipes shall be properly selected so as to achieve the required properties and finish in the fabricated part.
- v. The supplier shall procure raw material for grab pole and grab rail from reputed sources and shall submit test certificates and reports from the OEM.

## 5.2. Castings

The parts made by casting shall be stainless steel casting to grade SUS 304 / CF8 of ASTM A743.

## 5.3. Workmanship and Finish

All grab pole and grab rail assemblies shall be made to conform to the drawing dimensions.

The supplier shall have CNC bending facility to ensure repeatability in pipe bending.

Fabrication of grab pole and grab rail assemblies shall be carried out using dedicated weld Jigs and fixtures.

Fabrication of the assemblies shall be carried out by qualified welders. The weld areas shall be pickled and passivated.

The supplier shall submit welder qualification certificates as per EN 287-1 and Welding Process Qualification records as per EN/ ISO/ DIN standard.

The grab pole and grab rail assemblies shall be finished to brush finish and shall be free from defects such as burrs, sharp edges, joint marks and tool marks.

## 6. Quality Assurance Program

The supplier shall hold ISO 9001 certification and shall manufacture the product accordingly. The supplier shall submit a copy of ISO 9001 certification along with the offer. The supplier shall monitor and control the quality systems as per ISO 9001 guidelines. BEML and / or DMRC's representative may periodically conduct compliance audits of the supplier's quality management system.

The supplier shall develop and submit a Quality Assurance Plan (QAP) to BEML for review and approval based on ISO 9001 guidelines.

## 7. Scope of Supply

### 7.1. General

The sub-contractor shall supply Grab Poles, Grab Rails and Draught Screen Poles in conformance to this PTS and the applicable drawings.

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## 7.2. Submissions of Documents

The Supplier shall submit the following documents as a minimum along with the offer.

- ✓ Details of dedicated infrastructure facilities available for the production of Grab Poles, Grab Rails and Draught Screen Poles.
- ✓ Details of weld jigs and Fixtures required for the production of Grab Poles, Grab Rails and Draught Screen Poles.
- ✓ Quality Assurance Plan.
- ✓ Stainless steel Welder qualification certificates.
- ✓ Welding Process Qualification. (WPS & PQR)

The Supplier shall submit the following documents conforming to the technical requirements during design phase.

- ✓ Type test procedure document covering all the physical and mechanical properties.
- ✓ FAI Procedure document.
- ✓ Type test & FAI reports.
- ✓ Weighment document with Actual weights of each of the grab pole and rail
- ✓ Material test certificates.
- ✓ Dimensional check sheets for each of the assemblies

## 7.3. Packing

Supplier shall ensure proper packing (for each part) to avoid any transit damages during shipment of the grab pole, grab rail and draught screen pole.

## 8. Type Tests & Routine Tests

### 8.1. General

The stainless steel grab poles, grab rails and draught screen poles shall be type and routine tested in accordance with relevant standards and specifications specified at clause-5.

All such tests shall be carried out at the sub-contractor's cost, wherever performed, in the presence of and to the satisfaction of BEML and DMRC, who reserves the right to witness any or all of the tests and to require submission of any or all test specifications and reports.

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BEML and DMRC reserve the right to reasonably call for additional tests, if necessary. The subcontractor shall carryout the following type tests and routine tests, as minimum.

Sl. No.	Kind of Test	Test Method	Type Test	Routine Test
1	Visual Inspection	-	○	○
2	Dimensional Inspection	As per drawing dimensions	○	○
3	Brush Finish	As per approved sample	○	○
4	Raw Material Chemical Analysis	-	○	○ (For every batch)
5	Raw Material Mechanical Properties	-	○	○ (For every batch)
6	Load Test	UIC 566	○	-

The type test procedure document shall be prepared by the sub-contractor and BEML/DMRC approval shall be obtained before conducting the tests.

The routine test reports shall be submitted along with every batch of supplies

## 8.2. Visual Inspection

Each component of the grab pole and grab rail assembly, irrespective of lot size shall be examined visually for surface defects, irregularities and surface finish. The components shall be free from cracks, tool marks and manufacturing defects that would impair the utility of the item.

## 8.3. Dimensional Inspection

Dimensional inspection of the assembly / components as per drawing requirements shall be carried out and all parameters shall be recorded and the dimensional check sheet shall be submitted along with the supplies.

## 8.4. Chemical Composition & Mechanical properties

The chemical composition and mechanical properties of the components shall conform to specifications. The supplier shall carryout the chemical analysis and mechanical tests as per specification requirements and test reports shall be submitted with every batch of supplies.

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### 8.5. Load test

Load test shall be carried out as a type test on each type of completed grab pole, grab rail and draught screen pole assembly, to determine the appropriate performance under specified load as per clause 5 (v) of this PTS, prior to the start of the mass-production. The sub-contractor shall submit the type test procedure for BEML/ DMRC approval.

Load to be withstood for 3 arm grab pole : A maximum load of 4125 N (equally distributed on the three arm i.e approx. 1375 N on each arm)

Load to be withstood for Grab Rail : 1125 N for every one meter length of the grab rail assembly. Correspondingly load for each type of Grab rail assembly to be calculated and tested.

Load to be withstood for Draught screen pole : 2625 N

Each component / assembly shall withstand the loading condition without deformation and stress within permissible limits. Test report for the same shall be submitted. Type test procedure for each type of assembly will be decided during detailed design phase.

### 8.6. First Article Inspection (FAI)

The subcontractor shall offer each of the types of grab poles, grab rails and draught screen poles for First Article Inspection by BEML/ DMRC in accordance with the BEML/DMRC approved FAI plan prior to serial production in order to confirm that the item produced fully complies with the technical specifications, System design and manufacturing process.

The Subcontractor shall ensure that the produced grab poles, grab rails and draught screen poles are compliant to all requirements prior to inviting for testing and FAI. The pre-test result prior to official testing/FAI shall be submitted with the invitation letter to request BEML/ DMRC witness.

At the FAI, the subcontractor shall make available all pertinent design and manufacturing process documentation, test records, material certifications, etc.

During FAI ,if any inspections or tests indicate that specific hardware or documentation does not meet the specified requirements, the appropriate items shall be repaired, replaced, upgraded, or added by the Subcontractor at their own cost, as necessary to correct the noted deficiencies. After correction of deficiency, all tests necessary to verify the effectiveness of the corrective action shall be repeated.

If FAI has to be repeated due to non-compliances/ deficiencies noticed, the cost towards the same and the cost towards BEML/DMRC visit to subcontractor's place for witness of re-FAI shall be to subcontractor's responsibility.

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Upon acceptance of the FAI by BEML/DMRC, the subcontractor can proceed to manufacture grab pole, grab rail and draught screen pole assemblies. The quality of grab pole, grab rail and draught screen pole assemblies must meet or exceed the quality standards set at the FAI, and must incorporate any comments made by BEML/DMRC at the FAI.

Subcontractor shall note that BEML/DMRC FAI clearance will not relieve the subcontractor's responsibility towards design, development, testing, manufacture and supply during the revenue service.

At any point of time, during the execution of the contract, if BEML/DMRC has any concerns about the quality of the product supplied, BEML/DMRC reserves the right to randomly draw samples from any of the supply lots and the sub-contractor shall carryout the type tests at accredited outside labs and shall submit the reports.

## 9. Appendices

- Vendor Approval form.
- Technical offer Submittals Check List.

## 10. Submittals with Technical Offer

The Subcontractor shall submit the following documents along with the technical offer.

1. Complete Technical offer for grab pole, grab rail and draught screen pole assemblies.
2. Clause wise comments against PTS Document No. GR/TD/4501.
3. Details of infrastructure facilities available for the production of stainless steel Grab Poles, Grab Rails and Draught Screen Poles.
4. Details of weld jigs and fixtures required for the production of Grab Poles, Grab Rails and Draught Screen Poles.
5. Stainless steel Welder qualification certificates
6. Welding Process Qualification. (WPS & PQR) records.
7. Supporting documents for Qualification Criteria compliance (Clause 3).
8. Duly Filled Vendor approval form along with supporting Documents including QAP & ITP for MRS1 project, company profile with infrastructure facilities, product range etc., and satisfactory revenue service performance certificate from end user/Metro corporations for the Grab poles & rails.

Date:

Proforma No: MRS1/BEML/V.NNO/CAT-\_\_ /\_\_\_\_\_/M/ \_\_\_\_

<b>CHECKSHEET FOR SUBMISSION OF DOCUMENTS FOR NOTICE OF NO OBJECTION FOR SUB-CONTRACTOR/VENDOR FROM DMRC</b>			
<b>ITEMS:</b>			
<b>Category</b>	<b>A</b>	Items manufactured outside India and proposed to be used in all MRS1 trains.	<input type="checkbox"/>
	<b>B</b>	Items manufactured outside India and proposed to be used in all MRS1 trains but likely to be localised after some part quantity from OEM (shall be declared by BEML).	<input type="checkbox"/> Equivalent Localisation Quantity : __ Trainsets
	<b>C</b>	Locally manufactured items proposed to be used in all MRS1 trains.	<input type="checkbox"/>
<b>1</b>	<b>Proforma for Submission of documents</b>		<input type="checkbox"/> YES <input type="checkbox"/> NO
<b>2</b>	<b>Vendor Details</b>	Annexure-I	<input type="checkbox"/> YES <input type="checkbox"/> NO
<b>3</b>	<b>Sub-Vendor Detail</b>	Annexure-I	<input type="checkbox"/> YES <input type="checkbox"/> NO
<b>4</b>	<b>Certificate from BEML</b>	Annexure-II	<input type="checkbox"/> YES <input type="checkbox"/> NO
<b>5</b>	<b>Copy of technical purchase specification of BEML</b>		<input type="checkbox"/> YES <input type="checkbox"/> NO
<b>6</b>	<b>Inspection and Test Plan</b>		<input type="checkbox"/> YES <input type="checkbox"/> NO
<b>Note:</b>	<b>1</b>	Incomplete documents will not be reviewed by DMRC.	
	<b>2</b>	Items used in DMRC's existing rolling stock do not automatically qualify for use unless specifically approved by DMRC for this project.	
<b>(BEML Limited)</b>		_____ <b>(Proposed Vendor)</b>	

Date: \_\_\_\_\_

Proforma No: MRS1/BEML/V.NNO/CAT-\_\_\_/\_\_\_\_\_/P1/\_\_\_\_\_

<b>PROFORMA FOR SUBMISSION OF DOCUMENTS FOR NOTICE OF NO OBJECTION FOR SUB-CONTRACTOR/VENDOR FROM DMRC</b>					
<b>1</b>	Item description				
<b>2</b>	Vendor particulars along with proposed manufacturing unit submitted in Annexure-I	<input type="checkbox"/> YES	<input type="checkbox"/> NO		
<b>3</b>	Technical Specification & Inspection Plan	—			
<b>3.1</b>	Enclosed copy of Technical Purchase Specification of BEML	<input type="checkbox"/> YES	<input type="checkbox"/> NO		
<b>4</b>	<b>Details of experience/ satisfactory performance to establish compliance with ERTS 3.2.2.</b>				
The Information shall be submitted in following format:					
<b>S.No.</b>	<b>Mass Rapid Transit System where proposed sub-system/equipment/component has been used</b>	<b>Country</b>	<b>Quantity Used</b>	<b>Period in satisfactory Revenue Service [from/to] (Min 3 yrs in each MRTS)</b>	<b>Manufacturing Unit</b>
	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<b>1</b>	1				
<b>1</b>	2				
<b>1</b>	3				
<b>2</b>	1				
<b>2</b>	2				
<b>2</b>	3				
<b>3</b>	1				
<b>3</b>	2				
<b>3</b>	3				
<b>4</b>	1				
<b>4</b>	2				
<b>4</b>	3				
<b>4.1</b>	Based on above, is the proposed item compliant with ERTS 3.2.2				<input type="checkbox"/> YES <input type="checkbox"/> NO
<b>4.2</b>	Is the proposed manufacturing unit compliant with ERTS 3.2.2				<input type="checkbox"/> YES <input type="checkbox"/> NO
<b>4.3</b>	Confirmation that the subsystems used in MRS1, as proposed herein, shall have NO CHANGE in source, manufacturing unit, components, specification, material etc. from those approved unless got specifically approved from DMRC.				<input type="checkbox"/> CONFIRMED <input type="checkbox"/> NOT CONFIRMED
<b>4.4</b>	Information submitted herein as above is certified as correct, strictly in accordance with the MRS1 contract conditions and has been verified by BEML. In case any information is found to be factually incorrect or at variance with contract conditions at any stage, BEML commits to replace the concerned 'sub-system' in complete fleet as per the instructions of engineer, which shall be final and binding. In such case, BEML shall not be eligible either for seeking any claim whatsoever or for seeking extension of contract delivery period.				<input type="checkbox"/> CONFIRMED <input type="checkbox"/> NOT CONFIRMED
<b>4.5</b>	Confirmation that DMRC may depute a team of Engineers (around six) at Sub-contractor/vendor's office for requisite duration with a view to expedite finalization of designs in accordance with contract 'MRS1' conditions ERGS 5.11.3.				<input type="checkbox"/> CONFIRMED <input type="checkbox"/> NOT CONFIRMED
<b>5</b>	Notwithstanding the vendor approval communicated by DMRC on the proposal of BEML, responsibility for manufacture, testing, supply, commissioning and quality control shall continue to rest solely with BEML and BEML will be solely responsible for meeting all contractual requirements.				<input type="checkbox"/> CONFIRMED <input type="checkbox"/> NOT CONFIRMED
<div style="display: flex; justify-content: space-between;"> <span>(BEML Limited)</span> <span>_____ (Proposed Vendor)</span> </div>					

Date:

Proforma No: MRS1/BEML/V.NNO/CAT- \_\_\_ / \_\_\_ /P2/ \_\_\_

<b>6</b>	<b>Category B - Sourcing from facilities in India after supply of agreed quantity from approved manufacturing unit.</b>	
<b>6.1</b>	In case OEM wants to use manufacturing facilities in India (other than his own) for items for which the OEM has been approved, it shall enter into an agreement with such selected Indian equipment manufacturer and obtain prior approval from DMRC. No change in composition, rating, type, model no., manufacturing process, quality standards, design, etc. and make of the components used in assemblies/sub-assemblies of such equipment as manufactured by the approved parent vendor shall be made without specific prior approval of the Engineer.	
<b>6.2</b>	In case the vendor uses his own facilities for indigenization after part supply of equipment from the approved manufacturing unit, no change in design, component type/make, quality standards, manufacture procedure, sourcing of materials etc. shall be made without specific prior approval of the Engineer.	
<b>6.3</b>	In case OEM wishes to change/make/type specifications, etc. of any sub-components for supplies to be sourced from Indian facility, specific prior approval of the Engineer shall be obtained for changes made, model, specification, etc. Responsibility for obtaining such prior approval shall rest solely with the contractor.	
<b>6.4</b>	In case of local manufacturing of carbody or any other item(s) manufactured by BEML/OEM and used in initial trains, BEML shall be exclusively responsible for all quality assurance and inspection and their implementation and also ensure provision of physical partition as per the ERGS 1.1.7	
<b>7</b>	<b>Category C- Locally Manufactured Items</b>	
<b>7.1</b>	Does the manufacturing unit satisfy ERTS 3.2.2	<input type="checkbox"/> YES <input type="checkbox"/> NO
<b>7.2</b>	If not, basis/justification for proposal to be submitted for DMRC review	<input type="checkbox"/> YES <input type="checkbox"/> NO
<b>8</b>	<b>BEML confirms that in terms of ERTS 3.2.2, they would seek Notice of No Objection for Sub-Contractor/Vendor from DMRC notwithstanding the item(s) being used in DMRC's existing rolling stock.</b>	<input type="checkbox"/> YES <input type="checkbox"/> NO
<b>9</b>	<b>BEML shall submit Certificate as per enclosed Annexure-II confirming:</b>	
<b>9.1</b>	Compliance with Clause 6.6 of ERGS and GCC Clause 5.8 regarding supply of software tools/documents/materials etc.	
<b>9.2</b>	Compliance with Clause 8.12 of ERGS regarding supply of all drawings, specifications, patterns etc. in case the manufacture of these items is discontinued by the proposed vendor.	
<b>10</b>	<b>Commitment from the vendor that in case of any future procurement action by DMRC, he shall quote directly to DMRC.</b>	
<b>11</b>	<b>Commitment from the Vendor to provide technical support through permanent positioning of Vendor's staff at depots for meeting DLP obligations as per ERTS clause 3.2.5.</b>	
<b>12</b>	<b>BEML commits that the vendor shall be complying with all relevant contract clauses.</b>	
<p><b>(BEML Limited)</b> _____ <b>(Proposed Vendor)</b></p>		

Date:

Proforma No: MRS1/BEML/V.NNO/CAT- \_\_\_/\_\_\_\_\_/A1/\_\_\_\_\_

<b>Annexure-I</b>					
<b>SUB-Contractor/VENDOR/SUB-SUPPLIER DETAILS</b>					
<b>1</b>	Vendor/Sub-supplier OEM Name				
<b>2</b>	Details of item proposed to be sourced				
<b>3</b>	Sourcing by: <table border="0" style="width: 100%;"> <tr> <td style="width: 80%;">(a) BEML</td> <td style="text-align: right;"><input type="checkbox"/></td> </tr> <tr> <td>(b) Proposed Main vendor</td> <td style="text-align: right;"><input type="checkbox"/></td> </tr> </table>	(a) BEML	<input type="checkbox"/>	(b) Proposed Main vendor	<input type="checkbox"/>
(a) BEML	<input type="checkbox"/>				
(b) Proposed Main vendor	<input type="checkbox"/>				
<b>4</b>	Marketing Office/Head Office				
<b>4.1</b>	Complete address (including website)				
<b>4.2</b>	Contact person details in Head Office				
	<ul style="list-style-type: none"> <li>● Name</li> <li>● Designation</li> <li>● Telephone</li> <li>● Fax</li> <li>● Mobile</li> <li>● Email</li> </ul>				
<b>5</b>	Details of proposed compliant plant/manufacturing unit from where item is proposed to be sourced				
<b>5.1</b>	Complete address (including website)				
<b>5.2</b>	Contact person details				
	<ul style="list-style-type: none"> <li>● Name</li> <li>● Designation</li> <li>● Telephone</li> <li>● Fax</li> <li>● Mobile</li> <li>● Email</li> </ul>				
<b>5.3</b>	Supply details of the manufacturing unit for the proposed item or item with similar design.				
<b>5.4</b>	It is confirmed that the proposed manufacturing unit and the vendor are fully compliant with ERTS 3.2.2				
<b>5.5</b>	We commit that in case of any future procurement action by DMRC, the proposed vendor shall quote directly to DMRC without any involvement of BEML.				
<b>5.6</b>	We confirm that we will provide technical support through permanent positioning of our staff at depots for meeting DLP obligations as per ERTS clause 3.2.5.				
<b>5.7</b>	We have carefully gone through all relevant clauses of the MRS1 Contract and shall fully abide by the contract conditions and decisions communicated by DMRC during contract execution without exception.				
<table border="0" style="width: 100%;"> <tr> <td style="width: 50%;">(BEML Limited)</td> <td style="width: 50%; text-align: right;">_____ (Proposed Vendor)</td> </tr> </table>		(BEML Limited)	_____ (Proposed Vendor)		
(BEML Limited)	_____ (Proposed Vendor)				

Date:

Proforma No: MRS1/BEML/V.NNO/CAT- \_\_\_ / \_\_\_ /A2/ \_\_\_

Annexure-II

**Certificate for compliance with Contract conditions regarding  
Software requirements.**

This is certified that in the contract between BEML and \_\_\_\_\_ (proposed vendor) for supply of \_\_\_\_\_, specific conditions for confirming total compliance with the following contract condition/clauses have been included and agreed to between BEML and \_\_\_\_\_(proposed vendor):

**(a) Clause 6.6 of ERGS and GCC 5.8**

It is certified that we shall provide full access of application software(s) and any other software /hardware tools to DMRC which they may specifically require for the intended purpose specified in this specification. For all commercial software BEML shall provide all available documentation for the application and maintenance of that software.

Complete documentation along with the software to be supplied by BEML and its Vendor(s) shall comprise of Signal flow diagram, flow charts, functional blocks, details of signals, interpretations so as to enable engineer to debug and implement vehicle/train level modifications based on DMRC's experience, operational & maintenance requirements. Full access to the application software to DMRC shall be provided for this purpose.

It shall be possible for DMRC to modify/change various parameters/logics used in the software and implement the changes on trains. Full facilities including any software/hardware tools, simulation/test bench which are essential for this purpose shall be supplied.

It is committed to supply the software/hardware etc. within the scope specified in respective clauses of ERTS relevant for the proposed item/vendor and we would be fully complying with GCC 5.8

**(b) Clause 8.12 of ERGS:**

It is certified that \_\_\_\_\_ (proposed vendor) will supply all drawings, specifications, patterns and any other information required by DMRC for arranging such items in case the manufacture of these items is discontinued within 10 years by the proposed vender.

(BEML Limited)

\_\_\_\_\_ (Proposed Vendor)

**Undertaking for Technical/Service Support**

Appendix -1  
Page 6 of 6

**To Delhi Metro Rail Corporation Ltd.**

We \_\_\_\_\_ (proposed Vendor) shall provide Technical/Service support during Commissioning and post Commissioning period, till completion of the Defect Liability Period, for Mumbai Metro Line 2 & 7, 'MRS1' Project from their local office in India.

\_\_\_\_\_  
BEML Limited

(sign, Name & designation with stamp)

\_\_\_\_\_  
Proposed Vendor

(sign, Name & designation with stamp)

	<b>TECHNICAL OFFER SUBMITTALS CHECK SHEET</b>	<b>Project MRS1</b>
<b>Aggregate</b>	<b>Grab Pole, Grab Rail &amp; Draught Screen Pole</b>	<b>PTS DOC No.: GR/TD/4501</b>
<b>BEML Enquiry/ RFQ Reference :</b>		

SI. No.	DETAILS	SUBMITTED	NOT SUBMITTED
1	Complete Technical offer for grab pole, grab rail and draught screen assemblies.	<input type="checkbox"/>	<input type="checkbox"/>
2	Clause wise comments against PTS Document No. GR/TD/4501.	<input type="checkbox"/>	<input type="checkbox"/>
3	Details of infrastructure facilities available for the production of stainless steel Grab Poles, Grab Rails and Draught Screen Poles.	<input type="checkbox"/>	<input type="checkbox"/>
4	Details of weld jigs and fixtures required for the production of Grab Poles, Grab Rails and Draught Screen Poles.	<input type="checkbox"/>	<input type="checkbox"/>
5	Stainless steel Welder qualification certificates.	<input type="checkbox"/>	<input type="checkbox"/>
6	Welding Process Qualification. (WPS & PQR) records.	<input type="checkbox"/>	<input type="checkbox"/>
7	Supporting documents for Qualification Criteria compliance (Clause 3).	<input type="checkbox"/>	<input type="checkbox"/>
8	Duly Filled Vendor approval form along with supporting Documents including QAP & ITP for MRS1 project, company profile with infrastructure facilities, product range etc., and satisfactory revenue service performance certificate from end user/Metro corporations for the Grab poles & rails.	<input type="checkbox"/>	<input type="checkbox"/>

**Note : Incomplete submissions are liable for Rejection.**

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Signature of the Bidder with Seal