

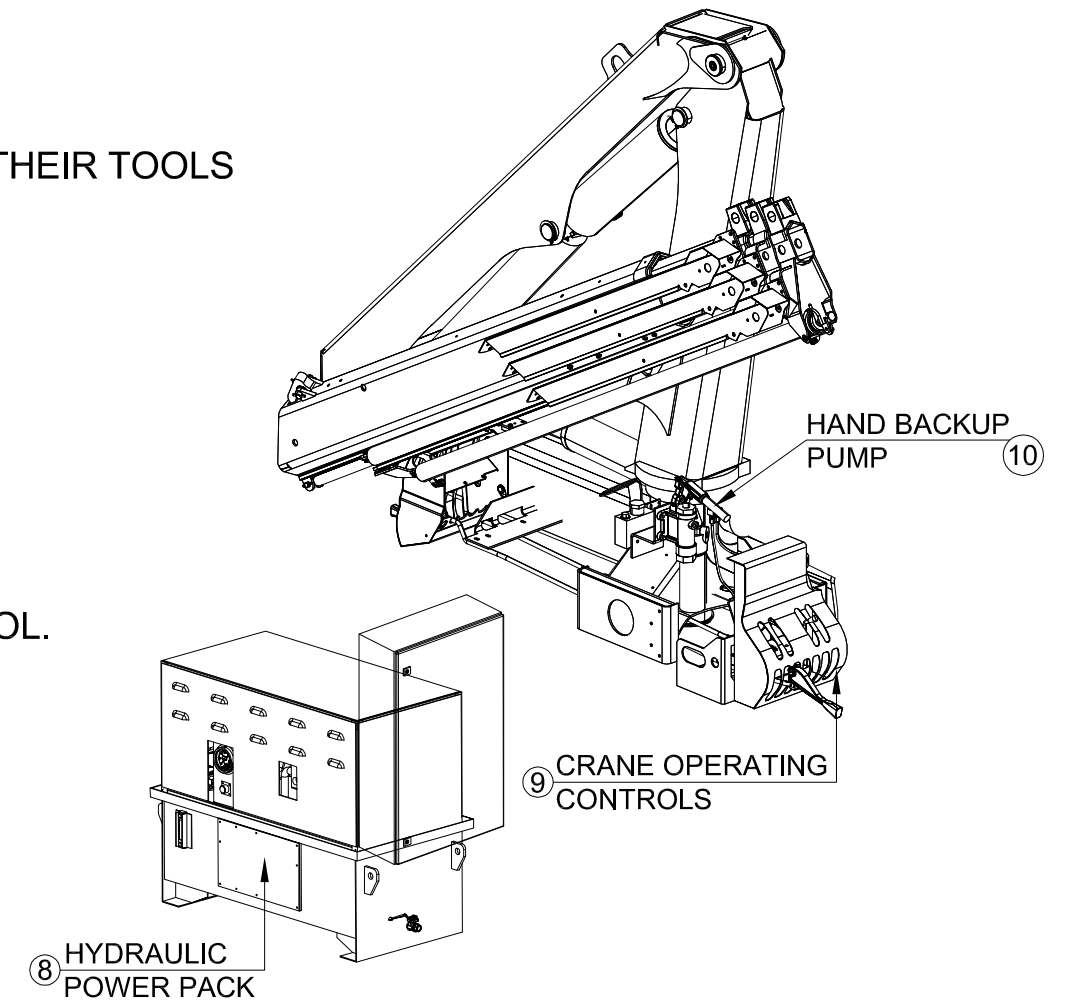
COPY RIGHT & CONFIDENTIAL THIS DOCUMENT IS THE EXCLUSIVE PROPERTY OF BEML & CONTAINS CONFIDENTIAL INFORMATION. THIS DOCUMENT OR ITS CONTENTS SHALL NOT BE USED, REPRODUCED OR DISCLOSED IN WHOLE OR IN PART, WITHOUT PRIOR WRITTEN PERMISSION OF BEML. THIS DOCUMENT & ALL ITS COPIES SHALL BE RETURNED TO BEML ON DEMAND DRAWING RELEASED FROM PLM, PHYSICAL SIGNATURE NOT REQUIRED

GRADE No.	N1	0.025
VALUE	N2	0.05
SYMBOL	N3	0.1
	N4	0.2
	N5	0.4
	N6	0.8
	N7	1.6
	N8	3.2
	N9	6.3
	N10	12.5
	N11	25
	N12	50
SURFACE ROUGHNESS		

MACHINING DEVIATIONS FOR LINEAR DIMENSIONS	RANGE	0 - 6	6 - 30	30 - 120	120 - 315	315-1000	1000-2000	2000-4000	ABOVE 4000	RA
	TOLERANCE	±0.1	±0.2	±0.3	±0.5	±0.8	±1.2	±2	±3	~
FOR DIMENSIONAL TOLERANCES OF SHEET METAL PARTS AND WELDED STRUCTURES, REFER STD. RD-227										
UNSPECIFIED TOLERANCE FOR LINEAR AND ANGULAR DIMENSIONS REF. IS 2102 (PT-1) (MEDIUM)							QUALITY OF WELD JOINTS REF, RD 230 MEDIUM			
VALUES OF SURFACE TEXTURE SHALL BE AS PER COMPANY STD DS. 1012.C.							STATUS: PROTO			
WELDING SHALL BE CARRIED OUT AS PER IS: 9595-96										

TECHNICAL SPECIFICATIONS:-

1. TYPE: DOUBLE ACTING HYDRAULIC CYLINDERS.
2. LIFT LOAD OF 1 TON FROM A DISTANCE OF 5 M.
3. INTERCHANGEABLE BASKET WITH MIN. 280 Kg CARRYING CAPACITY WITH 2 PERSON & THEIR TOOLS
4. THE CRANE SHALL CONFORM TO EN 12999-2020 OR LATEST VERSION OR EQUIVALENT.
5. MAX. HORIZONTAL OUTREACH FROM RAIL LEVEL: 8.8 M.
6. MAX. VERTICAL OUTREACH FROM RAIL LEVEL: 12 M.
7. SLEW RANGE: 400 DEGREES.
8. HYDRAULIC POWER PACK FOR OPERATING CRANE.
9. CRANE OPERATING CONTROL TO BE PROVIDED ON CRANE AND RADIO REMOTE CONTROL.
10. ALL THE HYDRAULIC MOVEMENTS HAVE TO BE SECURED BY A HAND BACKUP PUMP.
11. HYDROSTATIC TRANSMISSION CONTROL TO BE PROVIDED IN THE CRANE.
12. LOWERING SHALL NOT HAPPEN BY GRAVITY IN ANY CASE. LOAD PROTECTIVE VALVE TO BE PROVIDED.



UN CONTROLLED

NOTE:-

1. CRANE ASSEMBLY SHALL CONFIRM TO THE PTS Doc. No. GR/TD/6968.
2. COMPLIANCE FOR PTS CLAUSE TO BE SUBMITTED ALONG WITH OFFER.
3. OPERATING INSTRUCTION SHOULD BE RIVETED ENGLISH.
4. TEST CERTIFICATE TO BE PROVIDED FOR EACH EQUIPMENT.
5. THE CRANE TO BE PROVEN AND DOCUMENTARY PROOF TO BE SUBMITTED.
6. SAFE WORKING LOAD TO BE LEGIBLY STAMPED ON A NON-VITAL PART OF HOOK.

SL.No.	QTY	PART / STOCK No.	DESCRIPTION	SIZE	COMPANY STD./I.S	Wt. (Kg)						
△			PRODUCT	8W CMV (SG) WITH LIFTING PLATFORM & CRANE-DMRC/PATNA								
△			REF DRG	-								
△			MATERIAL	-								
△			HEAT TREAT.	APPD	NANDA NANDAN R	21/10/2024						
△			SURFACE TREAT.	REVD	HARI KUMAR S	19/10/2024						
△			TITLE	CHKD	HARI KUMAR S	19/10/2024						
△			CRANE ASSEMBLY (SCOPE)	DRWN	MD ILYAS	18/10/2024						
△				SCALE	1:20	SHEET OF 1	Wt.(Kg) 0					
△			ALT.No.	ECN NO/CHANGES	DATE	BY	CHKD	APPD	DRG No.	94450002	ALT	0

BEML LIMITED
NEW FRONTIERS - NEW DREAMS

94450002

**R&D CENTER
BEML LIMITED, BANGALORE**

Doc No. GR/TD/6968

Date 23.10.2024

Rev. No 1

Page 1/15

**PROCUREMENT TECHNICAL SPECIFICATION (PTS)
OF
CRANE WITH INTERCHANGEABLE BASKET
FOR
8W CMV (SG) WITH LIFTING PLATFORM AND CRANE**

Tender No.:


Reference Document: 302565/2023/O/o ED (UG/TR)

Customer: DMRC-Phase-IV / Patna Metro



UN CONTROLLED

	Name	Date	Signature
Approved By	NANDA NANDAN R	23.10.2024	
Reviewed By	S. HARI KUMAR	21.10.2024	
Prepared By	MD ILYAS	21.10.2024	

	PROCUREMENT TECHNICAL SPECIFICATION (PTS) OF CRANE WITH INTERCHANGEABLE BASKET	Doc. No.	GR/TD/6968
		Date	23.10.2024
		Rev. No.	1
		Page	2/15

REVISION HISTORY:

Rev. No.	Clause No.	Page No.	Changes	Revision Date
-	-	-	-	-



	PROCUREMENT TECHNICAL SPECIFICATION (PTS) OF CRANE WITH INTERCHANGEABLE BASKET	Doc. No.	GR/TD/6968
		Date	23.10.2024
		Rev. No.	1
		Page	3/15

Table of Contents

SL. No.	Description	Page No.
1.0	Introduction	4
	1.1 General	4
	1.2 Climatic Conditions	4
	1.3 Operating Environments	5
2.0	Abbreviations	6
3.0	General Requirements	7
	3.1 Defining of unclear aspects	7
	3.2 Responsibility of subcontractor	7
	3.3 Eligibility Criteria	7
4.0	Crane with Interchangeable	7
	4.1 Scope of Supply	7
	4.2 Construction of Crane with Interchange Basket	8
	4.3 Electrical Systems	8
	4.4 Safety Features	8
5.0	Responsibilities	10
6.0	DLP & CAMC	11
	6.1 DLP for 24 months	11
	6.2 Comprehensive AMC for 5 years	11
7.0	Design Submission	11
	7.1 Design Information	12
	7.1.1 General	12
	7.1.2 Design	12
8.0	Operation & Maintenance Manual	13
9.0	Testing	13
10.0	Vehicle Level Testing	13
11.0	Training	13
12.0	Warranty	14
13.0	Handing Over	14
14.0	Data submission schedule	14
15.0	Enclosure	15
16.0	Submittals	15

	PROCUREMENT TECHNICAL SPECIFICATION (PTS) OF CRANE WITH INTERCHANGEABLE BASKET	Doc. No.	GR/TD/6968
		Date	23.10.2024
		Rev. No.	1
		Page	4/15

1. Introduction

1.1 General


This document describes Crane with Interchangeable Basket to be design, manufacture & supply for 8W Catenary Maintenance Vehicle (SG) with Lifting Platform and Crane for DMRC Phase-IV / Patna Metro Project.

BEML shall carry out all required works and activities as supplier for 8W Catenary Maintenance Vehicle (SG) with Lifting Platform and Crane, while the subcontractor shall be responsible for all works required in this PTS with regard to Crane with Interchangeable Basket and shall be responsible for supporting the BEML activities for installation & testing (at BEML works) and commissioning at DMRC Phase-IV / Patna depot.

1.2 Climatic Conditions:

The 8W CMV (SG) with Lifting Platform and Crane shall be in continuous operation during the varying atmospheric and climatic conditions and should be designed to use on DMRC Phase-IV Project and Patna Metro Rail Project.


Ambient Temperature	0°C - 55°C
Altitude	up to 1000 Mtrs above sea level
Maximum relative Humidity	100%
Max. Temperature in Sun	75 °C
Vibration	The equipment, subsystem and their mounting arrangements shall be designed to withstand satisfactorily vibrations and shocks encountered in service. a) Maximum acceleration- 3.0g b) Maximum longitudinal acceleration- 5.0g c) Maximum train acceleration- 2.0g where "g" being acceleration due to gravity
Rainfall	The rainfall is fairly heavy and during dry weather the atmosphere is very dusty. The car should be able to negotiate waterlogged track with water level about 100 mm above the rail top for which the equipment should be suitably designed.
Wind Speed	High wind speed in certain areas, with wind pressure reaching 150 kg/m ²
Pollution severity level	"VERY HIGH" as per IEC-60815 Latest edition

	PROCUREMENT TECHNICAL SPECIFICATION (PTS) OF CRANE WITH INTERCHANGEABLE BASKET	Doc. No.	GR/TD/6968
		Date	23.10.2024
		Rev. No.	1
		Page	5/15

1.3 Operating Environments:

The dimensional operating and other requirements for 8W Catenary Maintenance Vehicle (SG) for DMRC Phase-IV / Patna Metro Project shown in Table:


Track Gauge	1435 mm
Minimum radius of curve	120 m at Elevated & grade sections. 100 m Depot & other sections.
Maximum super elevation	120 mm
Cant deficiency	85 mm
Maximum wind pressure	Maximum Velocity- 47 m/s, Wind Pressure-2.00 kN/ m ² at 10 m height.
Maximum moving Dimensions (Both in static & Dynamic conditions)	Shall conform to the kinematic envelope & Schedule of dimension SG (DMRC) with the pantograph and platform in lowered condition.
Maximum gradient	4%
Maximum Height of CMV	3845 mm (With pantograph, platform and crane and cradle in knock down condition)
Maximum permissible wheel base length of the car, overhang beyond bogie center, coupler height draw bar height.	Shall conform to the Schedule of dimension SG (DMRC) (attached as Appendix-6). Adequate clearance shall be allowed so that no component of the car shall cause any infringement as per DMRC specific requirements above rail level with wheels in fully worn conditions, full deflection of springs and effect of dynamics.
Tare Weight (inclusive of all items).	Approx. 50 Ton
Axle load (in fully loaded condition)	16 ton maximum
Maximum speed	80 Km/h (With the swiveling platform & crane in raised condition the car shall run at a maximum speed of 10 km/h)
Performance capabilities:	
Pay load (excluding Power equipment and hydraulic platform)	Minimum 12 ton
Period of continuous running at 60 km/h on generally tangent track followed by frequent to and fro movement at walking pace for 1-1/2 h)	5-1/2h total (4h+1-1/2h)

	PROCUREMENT TECHNICAL SPECIFICATION (PTS) OF CRANE WITH INTERCHANGEABLE BASKET	Doc. No.	GR/TD/6968
		Date	23.10.2024
		Rev. No.	1
		Page	6/15

Period of continuous running at 40 km/h up or down gradient of 1 in 60 to be followed by frequent to and fro movement at 5 km/h for 1-1/2 h on same gradient.	5-1/2h total (4h+1-1/2h)
Performance in monsoon and squally conditions	Un- restricted

2.0 Abbreviations:

"DMRC"	: Delhi Metro Rail Corporation
"Subcontractor"	: Supplier of Crane with Interchangeable Basket to BEML
"ERTS"	: Employer's Requirements Technical Specification.
"PTS"	: Procurement Technical Specification.
"OHE"	: Overhead Equipment.
"SOD"	: Schedule of Dimensions.
"DLP"	: Defect Liability Period.
"SG"	: Standard Gauge
"EN"	: European Standard
"ASTM"	: American Society for Testing & Materials.
"QAP"	: Quality Assurance Plan.
"RAMS"	: Reliability, Maintainability, Availability, Safety
"CAMC"	: Comprehensive Annual Maintenance Contract.
"NNO"	: Notice of No-Objection
"EMC"	: Electro Magnetic Compatibility
"MTBF"	: Mean Time Between Failure

	PROCUREMENT TECHNICAL SPECIFICATION (PTS) OF CRANE WITH INTERCHANGEABLE BASKET	Doc. No.	GR/TD/6968
		Date	23.10.2024
		Rev. No.	1
		Page	7/15

3.0 General Requirements

The subcontractor shall supply Crane with Interchangeable Basket into this PTS, Purchase order requirements and applicable drawings.

3.1 Defining of unclear aspects

If any term or clause is not described or not clear in the specification, subcontractor shall discuss those with design team in BEML, prior to making a contract, to confirm their definitions.

After making a contract, subcontractor shall follow the definition and opinion of BEML design team.

3.2 Responsibility of sub-contractor

Subcontractor shall have the responsibility for design, manufacture and supply of Crane with Interchangeable Basket along with RAMS plan, requisite documents and Manuals.


3.3 Eligibility Criteria

The subcontractor shall have supplied similar capacity Crane with Interchangeable Basket conforming to EN 12999-2020 or latest. Supporting documents for the above shall be submitted along with offers.

4.0 Crane with Interchangeable Basket

4.1 Scope of Supply


- A Crane with Interchangeable Basket & Hook
- B Mounting KIT
- C Hand Pump KIT
- D Hydraulic Power Pack
- E Radio Remote Control
- F Hydrostatic Transmission Controlling movements
- G GAD with Load Chart
- H Hydraulic & Electrical circuit
- I RAMS Plan
- J O&M Manual 5 sets per equipment
- K Parts catalogue - 3 sets per equipment
- L Troubleshooting manual - 3 sets per equipment
- M Test Certificate to be provided along with each equipment.
- N Tool kit to be provided.

	PROCUREMENT TECHNICAL SPECIFICATION (PTS) OF CRANE WITH INTERCHANGEABLE BASKET	Doc. No.	GR/TD/6968
		Date	23.10.2024
		Rev. No.	1
		Page	8/15

4.2 Construction of Crane with Interchangeable Basket

Crane having a capacity of 1-ton load at a distance of 5 meter with interchangeable bucket/basket with a capacity of minimum of 280 kg, suitable to carry for 2 persons with their tools.

- A. When using Hook instead of basket, it should be able to lift heavy traction equipment load of 1-ton minimum from a distance of 5 meters. The safe working load shall legibly be stamped on a non-vital part of the hook, an authentic test certificate shall be supplied.
- B. Nominal load of Crane with a basket shall be minimum 280 kg and it should easily and conveniently carry two workers with their tools in a bucket/basket. The safe working load shall legibly be stamped on a non-vital part of the Bucket and an authentic test certificate shall be supplied.
- C. Horizontal reach for the workers in the Basket from the track axis shall be up to 8.50 meters. Vertical reach for the workers in the Basket from rail level should be up to 12 meters.
- D. The crane shall conform to EN 12999-2020 or Latest version or equivalent.
- E. The basket control should be in the basket itself.
- F. The basket has to be fitted with a control panel for the hydrostatic/Hydrodynamic transmission for controlling movements.
- G. All the hydraulic movements have to be secured by a hand backup pump and platform frame of the vehicle.
- H. The basket must be fitted with plugs for electrical tools (5 kW), with lighting and two searchlights. The arrangement shall be approved by BEML/DMRC.
- I. In addition to one panel at basket, one redundant panel shall be provided at CMV driving cabs. There shall be one stop mushroom type switch in the panel to be used for application of brake and engine idle, if the basket is operated. Manual operation of the basket shall be possible in case of electrical/hydraulic circuit failure. Functions to be achieved with emergency stop needs to be listed clearly in detailed design.
- J. The wiring of the crane and bucket shall be carefully designed so that during complete movement and rotation of the unit, it does not get entangled with any other object of the CMV. Its operation shall be smooth and jerk free. In case of short circuiting of the wiring, abnormal movement shall not take place. Each circuit shall be protected with MCB of suitable rating. Fail safe design of bucket control to be elaborated in detailed design.
- K. The make of the crane shall be proven one for similar applications and documentary support shall be given for the same.
- L. The vendor of the crane and its design to be approved by BEML/DMRC. Hence, subcontractor shall submit technical details and company profile for approval.

	PROCUREMENT TECHNICAL SPECIFICATION (PTS) OF CRANE WITH INTERCHANGEABLE BASKET	Doc. No.	GR/TD/6968
		Date	23.10.2024
		Rev. No.	1
		Page	9/15

- M. The slewing angle of the crane shall be 400 degrees, to avoid any restriction in the crane movement on either side of the vehicle during maintenance.
- N. The Power Pack to be compact similar to one which is supplied to BEML in 2019 and technical details to be submitted for approval of BEML/DMRC before placing order.
- O. The Complete **Reliability, Maintainability, Availability, Safety (RAMS)** plan along with relevant document shall be submitted for review of BEML/DMRC and approval.
- P. The subcontractor shall submit the weights of all the equipments used in the schematic diagram of the Crane with Interchangeable Basket offered to BEML.


4.3 Electrical Systems

- i. The electrical control junction box should be of IP67 protection. Subcontractor shall furnish the details of installation & circuit diagrams along with the offer for BEML approval.
- ii. An overload protection shall be provided in the electrical circuit to safeguard the electric motor from overload.
- iii. Proper earthing arrangement shall be made for all the electrical circuits by providing earthing studs.
- iv. Provision for interlocking of Crane with vehicle propulsion should be provided (BEML Scope).
- v. The power and control cables should be of properly rated and environment free. The cables shall be properly routed with proper clamping at required places.

4.4 Safety features

- i. In The event of hydraulic failure, the Crane shall not collapse.
- ii. Provision for manual operation in the event of Hydraulic / Electrical failure.
- iii. Overload protection valve to be provided and same to submitted for BEML/DMRC approval.
- iv. A pressure relief valve shall be provided in the hydraulic circuit to safe guard the system in case of over pressurization.
- v. Machine shall have locked arrangement feature for load in any position. Lowering shall not be allowed by gravity in any case.

The technical details of all the features, Power Pack and its electrical circuit shall be submitted for approval of BEML.

	PROCUREMENT TECHNICAL SPECIFICATION (PTS) OF CRANE WITH INTERCHANGEABLE BASKET	Doc. No.	GR/TD/6968
		Date	23.10.2024
		Rev. No.	1
		Page	10/15

5.0 Responsibilities;

The subcontractor shall be responsible **for** the overall design and engineering of complete Crane with Interchangeable basket in accordance with his Scope of Supply.

The subcontractor shall be responsible for any design change of his scope of supply and work from the technical discussion between BEML and / or the DMRC / Patna Metro / or the subcontractor under the contracted price and delivery between BEML and the subcontractor.

The subcontractor shall be responsible for deputing his engineer to BEML for the technical meeting.


Any changes of the components shall be defined by the subcontractor and approved by BEML in order to avoid the mechanical interference with other equipment for the CMV.

The subcontractor shall be responsible for the scope of work as described below.

SI. No.	Description	Work Responsibility	
		BEML	Subcontractor
1	Design	X	X
2	Calculations	X	X
3	Approval of drawings	X1	X2
4	Type & routine test		X
5	Manufacturing		X
6	Technical documents		X
7	RAMS Plan		X
8	Manuals (O&M, Parts catalogue)		X
9	Installation	X1	X2
10	Factory Test	X1	X2
11	Testing & Commissioning at site	X1	X2
12	Training	X1	X2
13	Warranty for each component	X2	X1
14	Spares and CAMC		X

Note:

1. X - Sole Responsibility or Both
2. X1 - Leader i.e., responsible for activities required for the specified element of the scope of supply including any calculation, drawing, documentation and test connected with the design.
3. X2 - Support i.e., responsible for extending the support to leader by sharing the relevant information required by the leader to produce a satisfactory design.

	PROCUREMENT TECHNICAL SPECIFICATION (PTS) OF CRANE WITH INTERCHANGEABLE BASKET	Doc. No.	GR/TD/6968
		Date	23.10.2024
		Rev. No.	1
		Page	11/15

6.0 Defect Liability Period (DLP) and CAMC

6.1 Defect Liability Period (DLP) (24 months):


- i. Sub-Contractor shall be responsible & has to carry out all Breakdown/Corrective/ Preventive/Scheduled/ Routine/Periodic maintenance for his equipment supplied during DLP.
- ii. The sub-contractor shall submit consolidated list of Preventive/Scheduled/Routine/ Periodic Maintenance Schedules for 2 years along with price for his equipment supplied as a separate line item.
- iii. Penalty will be imposed for not carrying out Preventive/Schedule/Routine Maintenance up to 0.5% of the total contract value.
- iv. **Breakdown/Corrective Maintenance:** If contractor reports any items are fault/failure, sub-contractor has to rectify the fault of critical items and restore the system as early as possible but not later than 24 hours from fault reporting.
- v. A penalty of Rs. 10,000/- per day shall be levied on the sub-contractor during DLP, if any critical item or system/sub-system/redundancy affecting the normal/safe operation of CMV is not found working for more than 24 hours.

6.2 Comprehensive AMC after the DLP completion

- i. The sub-contractor shall be responsible for the comprehensive maintenance (repair, replacement of faulty/defective parts, Breakdown maintenance etc.) of his equipment supplied under the contract until the expiry of CAMC.
- ii. The sub-contractor shall submit consolidated list of Preventive/Scheduled/Routine/ Periodic Maintenance Schedules for 5 years along with price for his equipment supplied as a separate line item.
- iii. Penalty will be imposed for not carrying out Preventive/Schedule/Routine Maintenance up to 0.5% of the total contract value.
- iv. **Breakdown/Corrective Maintenance:** If contractor reports any items are fault/failure, sub-contractor has to rectify the fault of critical items and restore the system as early as possible but not later than 24 hours from fault reporting.
- v. A penalty of Rs. 10,000/- per day shall be levied on the sub-contractor during CAMC, if any critical item or system/sub-system/redundancy affecting the normal/safe operation of CMV is not found working for more than 24 hours.

7.0 Design Submission

The subcontractor shall provide BEML with all necessary drawings (2d & 3d), RAMS Plan, reports, calculations, specifications, technical data, system assurance, quality assurance, manufacturing and testing with respect to PTS according to the time schedule approved by BEML.

	PROCUREMENT TECHNICAL SPECIFICATION (PTS) OF CRANE WITH INTERCHANGEABLE BASKET	Doc. No.	GR/TD/6968
		Date	23.10.2024
		Rev. No.	1
		Page	12/15

These drawings and documents shall be delivered in English with the data format of, respectively, latest AutoCAD release. (Document-MS Word / PDF, spread sheet - MS excel).

7.1 Design information

7.1.1 General

The subcontractor shall provide, but not be limited to, the following general information in accordance with the schedule approved by BEML before contract award. To satisfy BEML that the subcontractor has the ability to supply the brake system in accordance with the requirement of PTS, before contract award, the subcontractor shall provide BEML for review and approval the following information.

Plan covering the following:


- Design Submission Plan
- Preliminary Technical system/product/function description (including Lay-Out drawing)
- RAMS Plan
- Test Plan
- Training Plan
- O&M Manual Submission Plan
- Clause by Clause comments on PTS
- DLP and CAMC Spare list

7.1.2 Design

The Crane with interchangeable basket shall be generally as per **drawing No. 94450002**. However, the subcontractor can define his own design and provide the details for approval before manufacturing.

The subcontractor shall provide, but not be limited to, the following design information in accordance with the time schedule approved by BEML. If any further documents are requested by DMRC/Patna, the same needs to be supplied by the sub-contractor.

- Drawings of all components under scope of supply.
- Electrical circuit diagrams.
- Detail Documents.
- Technical Description.
- RAMS Plan
- Test certification of materials.
- Routine test report
- Operation and maintenance manual – 5 sets /car.
- Spare parts catalogues - 5 sets/car.
- Training manual - 5 sets /car.
- Special tools and test equipment.

	PROCUREMENT TECHNICAL SPECIFICATION (PTS) OF CRANE WITH INTERCHANGEABLE BASKET	Doc. No.	GR/TD/6968
		Date	23.10.2024
		Rev. No.	1
		Page	13/15

- DLP Spare list
- CAMC Spare list

8.0 Operation and Maintenance Manual

The subcontractor shall provide Operation and Maintenance Manual and Spare Parts Catalogues for the equipments supplied in hard copies (3 sets) and electronic format.

The requirement for Operating and Maintenance Manuals and Spare Parts Catalogues shall be provided for approval by BEML according to the time schedule approved by BEML. The subcontractor shall provide softcopy for all O&M Manual according to detail requirement and required formats provided from BEML.

9.0 Testing

The subcontractor shall be responsible for performance tests of the components under scope of supply. BEML and/or DMRC / Patna Metro representative have the right to witness any of these tests at any stage of test progress.

The sub-contractor shall carry out the routine test of equipment and assembly and submit the test reports.

In the event of any test for the components is failed, the subcontractor shall, at his own expense, take whatever action is deemed such as rectification, re-adjustment or design changes to the satisfaction of BEML and DMRC / Patna Metro, in order to meet the testing requirements.

10.0 Vehicle Level Testing


The subcontractor shall extend the support during Installation & factory acceptance test (FAT) at BEML plant. Also, at customer depot (DMRC / Patna Metro) for site acceptance test (SAT) during Testing & commissioning.

11.0 Training

The subcontractor shall provide the class room training & materials for BEML's comprehensive training activities and works of Crane with interchangeable basket to the Employer's staff (Maintenance, operating, training and engineering) at BEML plant & at customer site.

The subcontractor shall provide the training materials (presentation & student guide) and training activity for the required days to assure that the Employer's staff is thoroughly trained in the operation, maintenance, and overhaul of the equipment supplied under this PTS.

The subcontractor shall propose the required days for the supplied equipments for Operation and Maintenance staffs.

	PROCUREMENT TECHNICAL SPECIFICATION (PTS) OF CRANE WITH INTERCHANGEABLE BASKET	Doc. No.	GR/TD/6968
		Date	23.10.2024
		Rev. No.	1
		Page	14/15

- The subcontractor shall submit information of instructor and training material of proposed training at least 6 weeks in advance of actual training schedule.
- Subcontractor shall depute the trainer(s) to the end user works/depot and BEML plant.
- The subcontractor shall provide the training according to BEML Training Plan for End user.
- The subcontractor shall provide, but not limited to, training materials (Hard copies & Electronic files).
- Subcontractor shall provide training program about operating and maintaining all the system devices provided. Training should be provided enough so that the corporate personnel may practice and learn how to use the operation, interface with other devices and testers.
- The training material and the entire training program shall be approved by BEML/ DMRC / Patna Metro Engineer (GC/ DMRC / Patna Metro).
- If End user or BEML request more training courses, subcontractor shall provide them.
- All expenses for trainings shall be borne by subcontractor.

12.0 Warranty

The sub-contractor shall be responsible for any defect or failure of equipments provided in Crane, due to defective design, material or workmanship up to period of 24 months from the date of successful commissioning of the car and same to be replaced at free of cost.

The Contractor, however shall not be responsible for the repair, replacement or making good of any defect or any damage to any parts/equipment/components of the car arising out of or resulting from any of the following causes;

- a. Improper operation or maintenance of the any parts / equipment / components of the car by the Employer.
- b. Operation of any parts / equipment / components of the Car outside specifications provided in the Contract.
- c. Normal wear and tear.


Also, the sub-contractor to follow GTC for warranty.

13.0 Handing Over

The sub-contractor shall hand over the complete equipments to BEML in accordance with the time schedule approved by BEML.

14.0 Data submission schedule

- A. The Supplier shall basically comply with PTS.
- B. The Supplier shall submit data submission schedule for BEML's approval before placement of contract.

	PROCUREMENT TECHNICAL SPECIFICATION (PTS) OF CRANE WITH INTERCHANGEABLE BASKET	Doc. No.	GR/TD/6968
		Date	23.10.2024
		Rev. No.	1
		Page	15/15

15.0 Enclosure:

- Crane with Interchangeable Basket to **drawing No. 94450002.**
- PTS to **doc. no. GR/TD/6968.**

16.0 Submittals

The sub-contractor shall provide the following as part of technical offer:

- a. Technical offer for Crane to **Drg.No.94450002.**
- b. Clause by Clause comments against **Technical Specification Document No. GR/TD/6968** with latest revision.
- c. DLP & CAMC Maintenance schedule, list of spares & list.