

**BEML LIMITED**

(A Govt. of India Mini Ratna Company under Ministry of Defence)  
BANGALORE COMPLEX, POST BOX: 7501, NEW THIPPASANDRA POST,  
BANGALORE-560075

**NOTICE INVITING TENDER**

**BID INVITATION NO: 6300039623**

**DT:06.06.2025**

**Subject:** Design, Manufacture, Supply, Testing & Commissioning, Training & Manuals of **Under Floor Wheel Lathe including DNP/DLP to PTS Doc. No: GR/TD/7721** Latest Revision required for Chennai Metro Rail Project-Phase II (ARE02A).

Quotation/offer are invited from Original Equipment Manufacturer (OEM) or authorized representatives of OEMs of **Under Floor Wheel Lathe** for Metro Rolling stock having experience in Design, Manufacture, Supply, Testing & Commissioning of **Under Floor Wheel Lathe** including DNP/DLP in accordance with the enclosed terms and conditions within the tender closing date.

Quotations should be submitted online (E-mode) in SRM Portal in Two-Bid system as below:

- 1) Technical Bid**
- 2) Commercial Bid**

**Note:** Commercial bids of only technically acceptable firms will be opened and considered for further evaluation by BEML.

Note:- The tender consists of 42 Nos. of pages including this page.

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### **3. General Instructions to Bidders:**

1. The Bidders are advised to carefully go through, read and understand this tender document completely including terms and conditions, Annexures and Appendices etc. before submitting bids
  - a. This NIT is not transferable under any circumstances.
  - b. All entries in the bids, formats which would be part of bids shall be in English either typed or written legibly. Erasing, over-writings and use of correction fluids are not permitted. All cancellations and insertions should be duly signed / attested by bidder concerned.
  - c. All the corresponding documents shall be attached along with the quotation/offer
  - d. The bidder shall **sign each and every page of tender document** before submitting the tender. No corrections/revisions will be entertained after opening the bids.
  - e. Late and/or incomplete tender shall not be considered.
  - f. Canvassing in any manner including unsolicited letters and request for post tender corrections shall render offers of such parties liable for rejection.
  - g. Bidder shall ensure that all the information & documents submitted by them are true & correct.
  - h. In case, it comes to the knowledge of BEML that the bidder has submitted false information before awarding of contract then the offer would be rejected.
  - i. In the event, it comes to the knowledge of BEML that the successful bidder has submitted false information, subsequent to the award of contract, the contract shall be cancelled/short closed by the company and shall invoke Risk purchase clause with liabilities on such bidder for the entire contract quantity. The PBG shall also be encashed as a result of consequence of breach of contract at the discretion of BEML.

2. Abbreviations used in this NIT

NIT-Notice Inviting Tender	BEML -BEML Limited
TS-Train set	CMRL -Chennai Metro Rail Limited
PTS- Procurement Technical Specification	ERTS -Employer's requirements General Specification
PO-Purchase order	DLP -Defect Liability Period
GTC- General Terms and Conditions	DNP – Defect Notification Period
CMC – Comprehensive Maintenance Contract	PBG – Performance Bank Guarantee
GeM - Government e-Marketing	SRM-Supplier Relationship Management

3. In case any person/persons, Company, firm, Associations having any litigation, arbitration cases between themselves and BEML Ltd, pending before any court of law/ Arbitrator shall not be eligible to participate in this tender.
4. Non-compliance with any of the tender conditions, incomplete offers, conditional and ambiguous offers are not acceptable and liable for rejection.
5. The bidder shall fill in all the required particulars in the blank space provided for the purpose in the tender document.
6. All the documents shall be uploaded in SRM Portal.
7. Fax/email quotations are not acceptable.
8. BEML reserves the right to accept or reject all tenders or any tender in part or full without assigning any reasons thereto, which is final & binding on the Bidder

#### **4. DETAILS OF THE TENDER**

This "Notice Inviting Tender" hereinafter referred to as the 'NIT' is designated as the tender for Design, Manufacture, Supply, Testing & Commissioning, Training & Manuals of **Under Floor Wheel Lathe including DNP/DLP to PTS Doc. No: GR/TD/7721** Latest Revision required under Depot Machinery & Plant for Chennai Metro Rail Project.

The tender consists of two parts as indicated below:

Sl.No.	Nature of Bid	Mode of Submission	Details
1	Technical Bid	SRM Portal	<b>Technical Bid (Without Price Details) shall be uploaded and submitted in the SRM Portal,</b> wherein only technical Bid /technical information in SRM Portal shall be uploaded.
2	Commercial Bid	SRM Portal	Price details to be duly filled in specified field on SRM Portal. Evaluation is based on the total bid value of all the items & services.

#### **Details of Items & Services:**

##### **1) Equipment with DNP/DLP**

**Table-1.1:** Equipment Quantity including Testing & Commissioning Activities

Sl.No	Part No.	Description	UoM	Quantity
1	52475001	UNDER FLOOR WHEEL LATHE (UFWL) TO PTS DOC GR/TD/7721 LATEST REV.	No	1

Scope shall also cover the following:

- Design, manufacture, supply, delivery at Madhavaram Depot, Installation and Testing & Commissioning activities for each M&P Equipment
- DLP Spares for 3 Years during Defect Notification period (DNP) /Defect Liability Period (DLP) as per PTS/ERTS requirements. Detailed year wise BOM for DNP/DLP Spares to be provided by the supplier.
- Supplier to provide special tools & Jigs and Software as recommended by the OEM in line with PTS clause (9)
- Supplier to provide documents as per PTS clause 5.1, 5.2.2 & 5.2.5
- Supplier to provide training & manual as per PTS clause (8)

#### **Required Delivery Schedule: UNDER FLOOR WHEEL LATHE (UFWL)**

Sl No	Part No / Description	Schedule	Qty.
1	Submission of Final Design Documents , Design Approval with NONO / NOWC, Manufacturing, FAT, Delivery of UNDER FLOOR WHEEL LATHE (UFWL) at Site	<b>Jan 2026</b>	1
2	Completion of Installation, Commissioning, Testing Trails, Training, Handing over of UFWL	<b>Mar 2026</b>	1

## **5. SUBMISSIONS OF TECHNICAL BID**

**Technical Bid Submission Conditions:** Technical Bid (without Price Details) shall be uploaded and submitted in the SRM Portal, wherein only technical Bid /technical information in SRM Portal shall be uploaded as indicated below:

- a) Bidders should upload duly filled, signed & stamped Integrity Pact with two witnesses **[Appendix – A]**.
- b) Clause by Clause compliance for the BEML Procurement Technical Specification (PTS): Doc no: PTS DOC GR/TD/7721 Latest revision **[Appendix – B]** Bidders to refer “PTS” (**Annexure-I**) enclosed along with this tender document. Bidders should upload the following documents duly filled, signature & stamped under technical bid and Format as per PTS also to be submitted
- c) Bidder to upload enclosures related to technical & other information deemed appropriate in respect of this tender on the letter head of the company, if any. Photographs / Drawings if any, may be uploaded.
- d) Bidders to refer “**GENERAL TERMS AND CONDITIONS (GTC)**” (**Annexure-II**) enclosed along with this tender document and upload clause by clause compliance of GTC duly filled, signature & stamped along with the supporting documents as specified therein. **[Appendix – C]**
- e) Bidders to commit that they will support BEML for requirement of any additional equipment, spares, service required at the later stage i.e. after taking over of supplied equipment and upto completion of CMC period i.e. 15 years. **[Appendix- D]**
- f) Bidders to upload duly filled, signature & stamped confidentiality agreement in plain paper **[Appendix – E]**
- g) Bidders to upload duly filled, signature & stamped Compliance to Land border sharing Clause – **[Appendix – F]**
- h) Bidders to upload duly filled, signature & stamped Compliance to purchase preference under public procurement policy – **[Appendix – G]**
- i) Bidders to upload duly filled, signature & stamped Compliance to Contact Details of Supplier/ Bidder – **[Appendix – H]**
- j) Bidders to upload duly filled, signature & stamped Compliance to Delivery Schedule – **[Appendix – I]**

BEML at its sole discretion reserves the right to seek the Soft/ Hard copies of the documents which are already been uploaded in SRM Portal, through Courier / post pertaining to technical bid of this tender enquiry at a later date, if required.

In such cases, only the documents uploaded in SRM Portal in original has to be couriered at the request of BEML. Any irrelevant documents furnished through courier will not be considered.

### **NOTE:**

- Please note Commercial Bid /Price details should not be indicated in TECHNICAL BID, else bid will not be considered for further evaluation.

## **6. SUBMISSIONS OF COMMERCIAL BID**

The price bid to be submitted through SRM Portal. The following details are to be entered in the SRM Portal.

Table-1

<b>Table-1. Equipment with DNP/DLP</b>						
Sl.No	Part No	Description	UoM	Total Quantity	Unit Rate in INR	Total Quantity
1	52475001	UNDER FLOOR WHEEL LATHE (UFWL) TO PTS DOC GR/TD/7721 LATEST REV.	No	1	Price to be uploaded in commercial bid only	
<b>Subtotal (Table 1)</b>						
<b>The prices are firm and fixed prices and PVC is not applicable.</b>						

### **NOTE:**

1. Bidder has to quote for all the items in SRM Portal.
2. Commercial evaluation will be arrived based on grand total of all the tendered items i.e. Supply of Equipment with DNP/DLP. (as per Table-1)
3. The commercial bids of the technically acceptable vendors only will be opened for further commercial evaluation.
  - i. Reverse Auction will be conducted among technically qualified Bidders in SRM Portal as per procedures and L1 status will be arrived based on total landed bid value (as per Table-1).
  - ii. The Reverse Auction will be conducted at the sole discretion of BEML.
4. Acceptable Currencies: Price should be quoted in any of the following currencies only.
  - a) **INDIAN RUPEE (INR)**
  - b) **EURO (EUR)**
  - c) **JAPANESE YEN (JPY)**

**[ANNEXURE – II]**  
**GENERAL TERMS & CONDITIONS (GTC) FOR PROCUREMENT OF MATERIALS**

**1. GLOSSARY, DEFINITIONS & INTERPRETATIONS:**

- a) The Purchaser means “(include company name and address)” (A Government of India Undertaking) incorporated under the Companies Act having its registered office at “BEML 1. Soudha, No 23/1, 4th main, S.R. Nagar, Bengaluru – 560027” and shall be deemed to include its successors and assignee.
- b) Supplier’ means a person having been included in a contract as a Contractor and also means a firm or company with whom the order for supply/execution of work is placed and shall be deemed to include the supplier’s successors, (approved by BEML Ltd.) representatives, heirs, executors and administrators. The supplier may also be referred to as the supplier, Contractor or vendor.
- c) Parties to the Contract’ shall mean the Supplier and the Purchaser as named in the main body of the Purchase Order.
- d) Tender’ means and includes quotation, invitation to tender and all other documents like drawings, specifications, quality plan, etc that form part of the tender document.
- e) Acceptance of Tender’ Means the letter of memorandum communicating supplier, the acceptance of the Tender and includes advance acceptance of this tender.
- f) Purchase Orders (PO) / Contract’ means and includes the invitation to tender, instruction to Tenderers, acceptance of tender, Letter of intent / letter of award, the general terms and conditions of Purchase Order / contract, special conditions of Purchase Order /contract, particulars, descriptions, specifications, schedule of prices, quantities, quality plan, drawings enclosed and other condition specified in the acceptance of tenders and includes the repeat order which has been accepted or acted upon by / for the supplier for the supply of stores and includes an order for performance of service and includes amendments, if any, that may take place subsequent to the discussions, negotiations, mutual agreement if any.
- g) Stores / Materials / Services’ means the goods or services as described in Procurement Technical Specification (P.T.S.) and in the Purchase Order which the supplier has agreed to supply under the Purchase Order.
- h) Specification means technical specifications of the Equipment / Material as set forth in Procurement technical specification (PTS) / technical drawings, which is part of tender. Employer(CMRL) Requirement Technical specification (ERTS) & Employer (CMRL) General Condition of contract(GCC) and Employer Particular condition of Contract (PCC)
- i) End-Customer / End-user means: Chennai Metro Rail Limited (CMRL).
- j) Words in singular include the plural & vice-versa.
- k) Words imparting the masculine gender shall be taken to include the feminine gender and words imparting persons shall include any firm, company or associations or body of individuals whether incorporated or not.
- l) The heading of these conditions shall not affect the interpretations or construction thereof of the contract.

- m) C.F.R/F.O.B/D.D.P/D.A.P is to be interpreted in accordance with the provisions of INCOTERMS 2020, unless otherwise specified in this Tender Document / Purchase order.

## 2. SUBMISSION OF THE TENDER:

Tender is in Two-Bid system (**Technical & Commercial Bid**). Bids should be submitted online mode only as follows:

### a) Submission of Technical bid (without price):

- i. The Bidder should upload all the requisite technical documents along with respective supporting documents and other information deemed appropriate in respect of the Tender.
- ii. The price details/commercial bid details should not be given in the Technical bid. If any of the bidder have given any price/commercial details in the Technical bid, their offer is liable for rejection and will not be considered for further evaluation.
- iii. Technical Bid will be opened on date and time of bid opening and the commercial Bids of those bidders whose technical bids are qualified (accepted) only will be opened for commercial evaluation.

### b) Submission of Commercial bid:

- i. The Commercial Bids of those bidders whose technical bids are qualified (accepted) only will be opened for commercial evaluation.
- ii. Price details in specified field on SRM Portal to be submitted.
- iii. Bidder to quote for all the items /Services.

### c) General:

- i. If dealers are submitting the bids in place of OEM, Dealer should submit Authorization letter from OEM.
- ii. BEML reserves right to reject the tender due to unsatisfactory past performance in the execution of a contract at any of BEML projects / units.
- iii. Bidders participating in the tender should declare in their offer that whether they have been black-listed / kept on hold for a specified period / given Business holiday for a specified period by any Public sector undertaking or Government departments. The reasons for such action with details and the current status of such hold shall be furnished to BEML.
- iv. In case any person/persons, Company, firm, Associations having any litigations, arbitration cases between themselves and BEML Ltd, pending before the Court / Arbitrator or initiated litigations/arbitrations in connection with any contract / tender issued by BEML Ltd and any contractor has defaulted against the BEML's orders, they are not eligible to participate in this tender.
- v. BEML may decide to scrap the tender/refloat the tender without assigning any reasons thereof before LOI/PO is committed. BEML reserves the right to accept, split, divide, negotiate, cancel or reject any tender or reject all tenders at any time prior to the award of the contract without incurring any liability to the affected tenderers or any obligation to inform affected tenderer, the grounds of such action.
- vi. BEML reserves the right to verify, in its sole discretion, any information given by the bidders independently through any third-party agencies. During this process, if it is found that any of the information given by the bidder is false / misleading, offers of such bidders would be out rightly rejected.
- vii. BEML also reserves the right to independently assess the capability and capacity of the bidder for execution of the order/contract. BEML's decision on any matter regarding short listing of bidders shall be final.
- viii. The Tender / Notice Inviting Tender is not an offer or a contract.



- ix. Bidders will not be compensated or reimbursed for the costs incurred in preparing Proposals. Proposals shall become BEML property.
- x. BEML's decision is final for Evaluation of the offers which is also based on Employer's (CMRL) requirement and conditions of contract for ARE02A Project.

### **3. SUPPLIERS SHARING LAND BORDER WITH INDIA:**

Land border sharing Declaration in line with Department of Expenditure's (DOE) Public Procurement Division order vide F. No. 6/18/2019-PPD dated 23.07.2020 & 24.07.2020 as amended from time to time and its subsequent Orders/Notifications issued by concerned Nodal Ministry for specific Goods/Products, shall be applicable for bidders / suppliers sharing land border with India. Bidders to upload signed & sealed compliance as per appendix attached as part of Technical Bid.

### **4. PREFERENCE TO MAKE IN INDIA:**

Purchase Preferences as per MII (Make In India Policy) and MSE Purchase Preference as Per Public Procurement Policy is Applicable in-line with revised public procurement (preference to make in India), order 2017 dated 04th June, 2020 as amended from time to time and its subsequent Orders/Notifications issued by concerned Nodal Ministry for specific Goods/Products, shall be applicable for bidders / suppliers under Purchase preferences. Bidders shall upload necessary supporting documents and to upload signed & sealed as per appendix attached as part of Technical Bid.

Consideration of bids shall be as follows:

(i) If technically qualified bid(s) with valid Notice of No Objection / Notice of No Objection with Conditions (NONO/NOWC) from end customer (i.e. CMRL) is available for local supplier (as per MII), then bids of local supplier/s only will be considered and bid of non-local supplier/s will not be considered for commercial bid opening and evaluation.

(ii) In the case of technically qualified bid(s) with valid Notice of No Objection (NONO/NOWC) from end customer (i.e. CMRL) is not available for local supplier (as per MII) then the technically qualified bid(s) with valid NONO/NOWC from end customer (i.e. CMRL) of non-local supplier/s will be considered for commercial bid opening and evaluation.

### **5. DELIVERY TERMS:**

- a) In case of foreign Supplier: F.O.B (Free on Board) to nearest port basis. The intimation for shipment should be provided 21 days prior to the delivery schedule to our nominated freight forwarder and the consignment to be handed over to our freight forwarder before the cut-off date for sailing.
- b) In case of Domestic Supplier: F.O.R (Free on Road) /F.D.D. (Free Door Delivery) to Designated CMRL depot, Chennai
- c) For DNP/DLP spares: DDP/ F.O.R- Designated CMRL depot, Chennai

### **6. PAYMENT:**

#### **I. SUPPLIES (Equipment)**

##### **a) APPLICABLE TO FOREIGN BIDDERS**

##### **i. TT payment: -**

100% in 60 days from the date of receipt of Design documents delivery, Factory Acceptance Test (FAT), delivery of complete equipment, fixtures, tooling, other accessories and after successful completion of installation, commissioning Testing, Trials, Training, Handover &

prove out of Equipment subject to acceptance certificate by CMRL/BEMLT&C at respective CMRL depot.

- ii. All bank charges incurred in India shall be borne by BEML and all bank charges outside India shall be borne by the supplier.

**b) APPLICABLE TO THE DOMESTIC BIDDERS**

- i. Terms of payment:  
100% in 60 days for non MSE / for MSEs in 45 days from the date of receipt of Design documents delivery, Factory Acceptance Test (FAT), delivery of complete equipment, fixtures, tooling, other accessories and after successful completion of installation, commissioning Testing, Trials, Training, Handover & prove out of Equipment subject to acceptance certificate by CMRL/BEMLT&C at respective CMRL depot.

Bidders to indicate the category of their firm under Micro/Small/Medium industries with necessary documentary proof of evidence for purpose of evaluation and our data up dation.

**Micro and Small enterprises (MSE) registered under UDYAM registration are eligible for the 45 days payment on submission copy of MSE certificate issued by UDYAM.**

**TDS (Tax deducted at source)** will be applicable for service purchase orders including Foreign Services and will be deducted as per law of land. SAC (Service Account code) shall be indicated by the bidder for the services that are proposed be carried out.

**The payment is further subject to the following:**

- a) The Invoice shall be compliant with GST laws.
- b) GST liability is to be discharged and ensure filing of outward supply details on GSTN portal within timeline prescribed.
- c) Any debit note/supplementary invoice if any, is to be raised within September month following the respective financial year of filing of annual return by BEML, whichever is earlier.
- d) Any loss of tax credit due to the reason attributable to supplier shall be recovered from supplier along with applicable interest and penalty.
- e) Bidders to indicate the GST and other levies applicable. GST shall be paid only after confirmation of payment of GST by vendors on GST Website.
- f) Relevant TDS / TCS as applicable shall be deducted as per prevailing Income Tax / GST / GOI notifications
- g) The supplier should submit the following documents for each supply:
  - Tax Invoice; GSTR-1 return filed with authorities with the relevant abstract
  - GSTR-3B return or any other form of return prescribed by the authorities.
  - Copy of Challans regarding deposit of GST
  - Certificate of Chartered Accountant

**7. PRICE BID VALIDITY:**

The Bid should be valid for 180 days from the date of tender opening. BEML's acceptance of the tender at the quoted / negotiated rates will be binding on the tenderer during the tenure of contract.

**8. FIRM PRICE FOR SUPPLY, NON-RECURRING SCOPE AND DELIVERABLES:**

The prices remain firm for the entire supplies of the purchase order and no escalation shall be entertained under any circumstances. The prices are to be firm & no increase in finalized price will be entertained after awarding contract during the period of Contract for any reasons whatsoever.

## 9. INSPECTION:

Bidders to offer Equipments for inspection as per PTS.

## 10. WARRANTY:

- a) The supplied goods/stores to the purchaser under the contract shall be of the highest grade, free of all the defects & faults in material and of the best quality, manufacture and workmanship and consistent with the established and generally accepted standards for materials of the type ordered and in full conformity with the contract specification, drawing or sample, if any and shall, if operable, operate properly throughout warranty period.

Any defect/fault & non-conformance to standards & descriptions as aforesaid, found during warranty period shall be rectified /repaired/replaced free of cost & at supplier's risk to the complete satisfaction of BEML / End user, within reasonable time at the ultimate destination.

The warranty period shall be 36 months after the date of issue of successful commissioning and proving test certificate of the machine at site. Any approval of acceptance issued by BEML during the course of installation, commissioning & proving out test shall not in any way limit the Contractor's liability.

In case where replacement of parts takes place during the warranty period, for replaced item and concerned sub-assembly shall extend further 36 months from the date of replacement of the defective parts. This extended period shall be known as extended warranty period.

- b) **Defect Liability Period (DLP) / Defect Notification period (DNP):** Defect Liability Period (DLP) / Defect Notification period (DNP): Defect Liability / Notification period shall start after taking over of equipment subject to acceptance by customer /CMRL and shall end Three years (36 Months) after taking over certificate of last equipment of quantity ordered. During DLP/ DNP, the Contractor shall be responsible for including but not limited to the following scope of activities:

- DLP Spares for 3 Years during Defect Notification period (DNP) /Defect Liability Period (DLP) as per PTS/ERTS requirements. Detailed year wise BOM for DNP/DLP Spares to be provided by the supplier.

- c) **Guarantee / Warranty replacement:** Guarantee / Warranty replacement shall be dispatched on D.D.P / F.O.R basis to Designated CMRL Madhavaram Depot for replaceable items during warranty period.

- d) The provisions of this Warranty shall be without prejudice to and shall not be deemed or construed so as to limit or exclude any rights or remedies which the BEML may have against the supplier, whether in tort or otherwise.

e)

If any defect or damage is one requiring immediate attention from safety / environmental view point / operational viewpoint, then BEML has the authority to proceed with rectification in any manner suitable and deduct such sums from the suppliers Bill or purchase order whichever is active.

11. **PERFORMANCE SECURITY / PERFORMANCE BANK GUARANTEE (PBG):** Supplier should submit single Performance Bank Guarantee for amount equivalent to 10% of the Contract value valid till Warranty period with additional 3 month claim period. The bank guarantee has to be submitted within 60 days from the date release of Purchase order from BEML but not later than 30 days before commencement of supplies pertaining to first delivery schedule indicated in the purchase order.

In case BEML is constrained to extend the Performance Bank Guarantee to its customer (CMRL), due to the failure of aggregates attributable to the supplies made by the supplier or non-fulfilment of NRC activities if applicable, then the costs involved to BEML for such PBG extensions shall be borne by the supplier.

Performance Bank Guarantee shall be returned back only after receipt of performance certificate from CMRL and if there is any defect /failure/negligence/complaints and /or any claims notified to BEML by CMRL on part of supplier during DNP/DLP, then the validity of PBG shall be extended till issuance of Performance Certificate by CMRL.

**General terms of PBG:**

- a) In case of foreign bank guarantees, the BGs from foreign banks, authorized /recognized by RBI to issue a Bank Guarantee, in their own letter head will be accepted.
- b) In the case of PBG/s submitted from Indian Bank, the PBG shall be furnished by Scheduled Commercial Banks authorized by RBI to issue a Bank Guarantee.
- c) Format for PBG is attached for reference.
- d) Performance Bank Guarantee shall be returned back only after receipt of performance certificate from CMRL and if there is any defect /failure/negligence/complaints and /or any claims notified to BEML by CMRL on part of supplier during DNP/DLP, then the validity of PBG shall be extended till issuance of Performance Certificate by CMRL
- e) In the absence of performance bank guarantee to be submitted by the supplier as per contract terms, BEML will not open Letter of Credit (LC) in the cases of LC in favor of supplier pertaining to the shipment / stores to be supplied as per first delivery schedule indicated in the purchase order. Any delay in submission of performance bank guarantee by the supplier, the subsequent delay in opening in Letter of Credit by BEML and supplies to be effected by the supplier are to the account of the supplier, which attracts liquidated damage charges as per contract terms.
- f) No claim shall lie against BEML Ltd., in respect of interest on cash deposits or Govt. Securities depreciation thereof.
- g) BEML shall be entitled to and it shall be lawful on its part to encash the Bank Guarantee in whole or in part in the event of any default, failure or neglect on the part of the supplier in the fulfilment or performance in all respect of the Purchase Order.
- h) The Bank Guarantee shall be established through **Structured Financial Messaging System (SFMS)** mode from a Scheduled Commercial Bank authorized by RBI in India as defined by RBI
- i) A separate copy of the BG has to be sent by the issuing bank to the Purchaser's bank. The details of Purchaser's bank are as under:

**STATE BANK OF INDIA**  
**Overseas Branch, No.65,**  
**St. Marks Road,**  
**Bangalore – 560001**  
**IFSC Code: SBIN0006861**

Following codes are to be used by issuing bank for the purpose of Confirmation and amendment in Bank Guarantees:

Code	Purpose
MT760	Confirmation of Bank Guarantee
MT767	Amendment in Bank Guarantee

- j) The Bank Guarantee shall also be established in e-BG mode through NeSL platform.
- k) The Bank Guarantee validity shall be extended as required till the completion of all contractual and warranty obligations in Full.

## 12. RIGHT TO VARY QUANTITIES & QUANTITY OPTION CLAUSE:

- a) BEML reserves the right to increase or decrease the quantity specified in the schedule of requirements without any change in the unit price or other terms and conditions within the agreed delivery schedule
- b) BEML may at its discretion may advice the supplier in writing about the increase of the total quantity upto additional 50%.
- c) Supplier shall be required to supply increased ordered quantities at the contracted terms & conditions and determined prices (Excluding design cost, Type test cost, FAI test cost, Training & Manuals cost and Testing & commissioning cost) and no additional amount on account of quantity variation or escalation or any other account whatsoever payable to the supplier
- d) In case of increase in quantity beyond the original bid quantity, the delivery schedule for the increased quantities shall be mutually decided at the time of exercise of quantity variation by the Purchaser

## 13. LIQUIDATED DAMAGES / DELAY DAMAGES CLAUSE:

The time and the date of delivery of the stores stipulated in the PO shall be deemed to be the essence of the Purchase order and delivery must be completed not later than the dates specified therein. The supplier shall strictly adhere to the delivery schedule indicated in the PO. Any supplies made ahead of this schedule are liable for rejection at the discretion of BEML. Should the supplier fail to deliver the stores or any consignment thereon within the period prescribed for such delivery, BEML shall be entitled to levy delay Damages as follows with an upper limit of 10% of order value.

1	2	3	4	
Sl.No	Key Date Description	End date of Completion as required by end used CMRL based on ARE02A contract	Delay Damages that will be levied from supplier for each day of delay beyond end date as in column 3 (INR Lakhs per day)	
			1 to 28 days	From 29 <sup>th</sup> day onwards
1	Submission of Final Design Documents, Design, Approval with NONO/NOWC, Manufacturing, FAT, Delivery of UFWL at site of full order quantity	15 <sup>th</sup> Feb 2026	INR 1 Lakh per day	INR 10 Lakh per day
2	Completion of Installation, Commissioning, Testing, Trails, Training, Handing Over of UFWL of full order quantity	15 <sup>th</sup> Jun 2026	INR 1 Lakh per day	INR 10 Lakh per day

## 14. RISK PURCHASE CLAUSE:

The time and the date of delivery of the stores stipulated in the PO shall be deemed to be the essence of PO and delivery must be completed not later than the date specified therein. Shall the supplier fail to

deliver the stores/services or any consignment thereof within the period prescribed for such delivery, BEML shall be entitled at their option either;

- a) To purchase elsewhere, without notice to the supplier on the account and at the risk and cost of the supplier the stores not delivered or other of a similar description (where stores exactly complying with the description and readily procurable) without cancelling the PO in respect of consignment not due for delivery

**or**

- b) To cancel the purchase order.

In the event of action being taken under clause (a) or (b) above, the supplier shall be liable for any loss, which BEML may sustain on that account but the supplier shall not be entitled to any gain or purchases made against default. As soon as it is apparent that the scheduled dates cannot be adhered to, an application shall be sent by the supplier to BEML, well before the expiry of the delivery period specified in the purchase order. Without prejudice to the foregoing rights, if such failure to deliver in proper time as aforesaid shall have arisen from any cause which BEML may admit as a reasonable ground for an extension of the time (and their decision shall be final) they may allow such additional time as they may consider justified by circumstances of the case.

Delivery required to be made in lots shall be made in lots only and any extra deliveries involved either on account of repeated rejections or variance in supply of lots shall be liable for service charges of 5% of the purchase order value for each extra delivery.

#### **15. SECRECY AND CONFIDENTIALITY:**

- a) All the information, know-how, technical data, specification and drawing models or specimens furnished by BEML for the purpose of or in connection with the manufacture and supply of the stores hereby tendered constitute the property of BEML and the supplier shall keep them in strict confidence and he/ she shall not divulge the same to anyone else except under the authority and for the purpose of BEML. All such documents, data, drawing, models and specimens are the property of BEML and shall be returned when done with or when demanded by BEML.
- b) The supplier shall not supply the material ordered by BEML to anyone else other than BEML and shall not disclose any initiations, development or adaptations thereof to anyone.
- c) BEML shall be entitled to prevent a breach of the above and claim damages in case of breach. In case of non-performance in this PO, BEML will have to take procurement action at your risks and cost apart from levy of liquidated damages.
- d) Confidentiality agreement to be executed as per Appendix E.

#### **16. AUTHORITY OF PERSONS SIGNING DOCUMENT:**

A person signing the tender or any other document in respect of the tender shall be deemed to have power to do so on behalf of the Supplier.

#### **17. ACCEPTANCE OF ORDER:**

The supplier shall send Order Acceptance within two weeks from the date of LOI/LOA/Purchase Order or such other period as specified / agreed by the Purchaser. Purchaser reserves the right to revoke the order placed if the order confirmation differs from the original Purchase Order placed and the Purchaser shall only be legally bound after it has agreed explicitly in writing to be in agreement with the deviation. The acceptance of deliveries or supplies by Purchaser as well as payments made in this regard shall not imply acceptance of any deviations. The Purchase Order will be deemed to have been accepted if no communication to the contrary is received within two weeks (or the time limit as specified / agreed by the Purchaser) of receipt of the order.

#### 18. OTHER CONDITIONS:

- a) Refer BEML Purchase Manual (can be accessed in BEML website [www.bemlindia.in](http://www.bemlindia.in)) for Important terms and conditions of tender and General Terms & conditions applicable to contracts & purchase orders refer General Terms & Conditions
- b) The firm shall take necessary permission for their employees to enter the factory premises and the firm shall arrange ESI & PF coverage to their employees / labourers if any from their end. The firm shall indicate ESI NUMBERS for the labourers hired or employed in advance in order to prepare work permit inside the factory.
- c) BEML will not have any kind of binding towards the compensation on case of injury / death to the firms employees while working in BEML /CMRL premises or other wise.
- d) BEML will not have any kind of binding on damages or loss to the tools/instruments etc. brought by the firm for commissioning purpose.

#### 19. PRICE, INVOICING AND PAYMENT:

The agreed prices are **fixed prices** for the supply, in the currency as specified in the Purchase Order. They shall include packing, forwarding, loading and carriage to the place specified by the Purchaser and are inclusive of all applicable taxes, duties etc. except for those specifically agreed between the supplier and purchaser. The method of invoicing shall be without prejudice to the parties; agreement as to the place of performance. Invoices shall be submitted bearing the Purchase Order number & date, item number / s and supporting documents as called for in the Purchase Order.

As soon as each shipment is made in line with the delivery schedule specified in the purchase order, the supplier shall send **one set of Original documents and three (3) sets of photocopies** each of the following documents to the address indicated below by courier service.

- i) Commercial Invoice
- ii) Delivery Challan
- iii) Packing List
- iv) BEML's Inspection clearance document(s), material test certificates and other applicable quality documents pertaining to the supplies.

##### **Postal Address**

The Deputy General Manager,  
Metro Purchase Department  
BEML, Bangalore Complex,  
PB No.7501, New Thippasandra post,  
Bangalore, Karnataka, India,  
Postal Code - 560 075

#### 20. PROGRESS REPORT:

The supplier shall regularly inform the progress of work and in such form as may be called for by the Purchaser from time to time. The submission and acceptance of such reports shall not prejudice the rights of the Purchaser in any manner.

## **21. QUALITY & WORKMANSHIP:**

The stores supplied shall be of the best quality and Workmanship shall be in strict conformity with all the drawings and specifications furnished with the Purchase Orders and shall answer to the description in all respects. All supplies shall be accompanied by supplier's works inspections / test certificates duly certifying, the Stores are in strict conformity with the drawings / specifications. However, final acceptance will be subject to inspection and approval at BEML works. Once the materials are rejected and communicated to the supplier, no request shall be entertained for re-inspection or acceptance of the stores. However, BEML reserves the right to re-inspect the stores and consider acceptance at its discretion.

## **22. QUALITY, CONDITION OF DELIVERY:**

The Supplier shall guarantee that the delivery is of good quality and free from all defects and in the case of services rendered that they are performed by skilled personnel and that new materials are used. The Supplier shall guarantee that the delivery corresponds exactly with the provisions of the agreement, the reasonable expectations of Purchaser regarding the characteristics, quality and reliability of delivery. The Supplier guarantees that the delivery is suitable for the purpose for which it is intended by its very nature or which is evident from the specifications listed and from the order.

The Supplier shall guarantee that the delivery complies with legal requirements applicable in India and other (international) Government regulations, as applicable. The supplier shall guarantee that the delivery complies with the customary norms and standards in the relevant branch of trade or industry. The supplier shall be responsible for compliance with applicable technical, safety, quality, environmental requirements and other regulations in relation to his product, packaging, and raw and ancillary materials.

## **23. SUPPLY OF SAMPLE: (if applicable)**

The Contractor shall produce samples of all materials and shall obtain approval before he places bulk order for the material for incorporation in the works. In respect of materials for which samples are not kept or detailed specifications is not given hereinafter, such materials shall comply with the latest relevant Indian Standard Specifications published up to the date of issue of this tender. The Contractor shall on demand produce original receipts vouchers/invoices in respects of materials supplied by him.

## **24. INSPECTION, TESTING & CONSEQUENCE OF REJECTION:**

Inspection & Testing as per PTS.

The goods and stores shall be of approved design and each part /component may be inspected and tested by the Purchaser prior to shipment and shall fully comply with relevant requirements of purchaser.

Purchaser has the right to inspect the delivery. In the event of rejection, Purchaser shall inform the Supplier accordingly and Purchaser shall be entitled to replacement or repair at its discretion or may proceed to terminate or annul the agreement. All this does not affect Purchaser's right to compensation.

In case the goods / stores are rejected at the time of inspection at BEML or the rejections are noticed at the time of further processing the supplier will be informed of these rejections. On receipt of this information the supplier shall immediately arrange to collect the rejected items at his cost and risk and



arrange for the replacement of goods within the shortest possible time. Under no circumstances the supplier shall compel the Purchaser to rework the rejected goods.

Wherever the supplier has not collected the rejected items within 60 days from the date of intimation, BEML shall have the right to dispose the goods and all cost related to the cost of material, statutory levies incurred both in procurement and disposal shall be recovered from the supplier from any of the bills that are due. The supplier shall have no claims whatsoever against the Purchaser for such disposal.

Purchaser or his authorized representative shall be entitled at all reasonable times during execution to inspect, examine and test at the Supplier's premises the material and workmanship of all stores to be supplied under the Contract, and if the part of the stores are being manufactured at other premises the Supplier shall obtain Purchaser's or his authorized representative's permission to inspect, examine and test as if the said stores are being manufactured at the Supplier's premises. Such inspection, examination and testing, if made shall not release the Supplier from any obligation under the Contract.

All costs related to inspections and re-inspections shall be borne by the Supplier. The cost of inspection staff / third party specified by the Purchaser shall be borne by Purchaser, unless otherwise specifically agreed. Whether the Contract provides for tests on the premises of the Supplier or any of his Sub-contractor/s, Supplier shall be responsible to provide assistance such as, labour, materials, electricity, fuels, stores, apparatus, instruments as may be required and as may be reasonably demanded to carry out such tests efficiently. Cost of any type test or such other special tests shall be borne by the Purchaser only if specifically agreed.

The supplier shall give the authorized representative of the Purchaser reasonable prior notice in writing of the date on and the place at which any stores will be ready for inspection / testing as provided in the Contract

## **25. RAW MATERIALS ARRANGEMENT:**

The supplier shall make his own arrangement to procure all raw materials required and BEML shall not be responsible for any assistance in such procurement or whatsoever.

## **26. IDENTIFICATION OF ITEMS / PIECES:**

The supplier shall indicate / emboss / engrave, suitable identification marks (Viz. BEML stock number, supplier code number, batch no. etc.,) on each item/piece (or) on all components at convenient non-machinable place as per drawing, wherever applicable.

Also, shall indicate BEML part number, PO No. and date in all delivery documents, invoices and correspondence, wherever applicable.

## **27. PACKING AND MARKING:**

- a) Seaworthy Packing to be in such a way that it should avoid transit/storage/handling damage.
- b) The supplier shall package the deliveries safely and carefully and pack them suitably in all respects considering the peculiarity of the material for normal safe transport by Sea / Air / Rail/ Road to its destination suitably protected against loss, damage, corrosion in transit and the effect of tropical salt laden atmosphere. The packages shall be provided with fixtures / hooks and sling marks as may be required for easy and safe handling by mechanical means.
- c) The packing, shipping, storage and processing of the delivery must comply with the prevailing legislation and regulations concerning safety, the environment and working conditions. Items packed with raw / solid wood packing material shall be treated as per ISPM – 15 (fumigation) and

accompanied by Phytosanitary / Fumigation certificate. If safety information sheets exist for a delivery or the packaging, the Supplier must always supply these sheets direct (at the same time).

- d) Supplier shall indicate approximate net weight, gross weight and dimension of the package to enable BEML to determine the mode of dispatch. The packing should withstand the weather conditions during transit. The packing should not damage the contents in the package while transporting and handling. The safety and handling precautions should be clearly marked on the packages. The packing should be easily transportable without any damage. Each consignment should have individual packing list.
- e) Marking shall include the following information in sequence on the frame commensurate with the size of package.

**To: M/s. BEML Limited  
C/o CMRL Madhavaram Depot  
Near Tamil Nadu Veterinary & Animal Science University  
Madhavaram,  
Chennai – 600051,  
Tamil Nadu State, India.**

**Purchase order number:**

**Shipper's mark:**

**Package number:**

**Identification number:**

**Caution marks, if applicable:**

**Net weight, Gross weight and cubic measurement (CBM), whichever is appropriate for the shipment.**

## **28. APPLICABLE LAWS AND JURISDICTION OF COURTS:**

Indian laws both substantive and procedure, for the time being in force including modifications thereto, shall govern Contract. The competent Indian courts shall have sole jurisdiction over disputes between purchaser and the Supplier.

## **29. JURISDICTION:**

Courts of Bangalore alone shall have jurisdiction to decide any issue / dispute arising out of the Arbitration or this Purchase Order in exclusion of all other Courts. However, jurisdiction of any other court may be accepted by mutual discussion and agreement by and between BEML and the Supplier.

## **30. ARBITRATION:**

Any disputes and differences that may arise between the parties in connection with this Agreement/Contract shall be settled by the parties amicably by way of mutual discussion / negotiation / conciliations. In case parties fail to settle the dispute amicably, then the dispute or difference shall be referred to India International Arbitration Centre for resolution. The Arbitration Tribunal shall consist of Sole / three Arbitrator /s. The Arbitrator /s shall be appointed and Arbitration proceeding shall be conducted in accordance with the provision of India International Arbitration Centre (Conduct of Arbitration) Regulations, 2023.

During Arbitration, "Supplies under this Purchase Order, if reasonably possible, may continue by mutual agreement during the dispute / Arbitration proceedings"

### **31. INTELLECTUAL PROPERTY RIGHTS; LICENSES:**

If any Patent design, trademark or any other intellectual property rights apply to the delivery or accompanying documentation, Purchaser shall be entitled to the legal use thereof free of charge by means of a non-exclusive, worldwide, perpetual license. All intellectual property rights that arise due to the execution of the delivery by the Supplier and by its employees or third parties involved by the Supplier for performance of the agreement belong to Purchaser. The Supplier shall be obligated to do everything necessary to obtain or establish the above-mentioned rights. The Supplier guarantees that the delivery does not infringe on any of the intellectual property rights of third parties. The Supplier shall also be obligated to do everything necessary to obtain or establish the alternate acceptable arrangement pending resolution of any (alleged) claims by third parties.

The Supplier shall defend and indemnify BEML against any claims, costs or expenses incurred by reason of any infringement of alleged infringement of any letters, patent, registered design, trademarks or trade name by the use of sale of the stores / goods /material and against all costs or damages which BEML may undergo in legal action for such infringement or for which the BEML may become liable in any such action.

The supplier shall at all times indemnify BEML and shall take all risk of accidents or damage which causes a failure of the supply. The supplier shall comply with the provisions of Contract Labour (Regulation and Abolition) Act, 1970 and the Contract Labour (Regulation and Abolition) Central Rules 1971as modified from time to time wherever applicable and shall also indemnify the Company from and against any claims under the aforesaid Act and the Rules.

### **32. BRIBES AND GIFTS:**

Any bribe, commission, gift or advantage given, promised or offered by or on behalf of the supplier or his partner, agent or servant or anyone on his or their behalf to any officer, servant, representative or agent of BEML or any person on his or their behalf in relation to the obtaining or to the execution of or any other contract with BEML shall in addition to any criminal liability which the supplier may incur, subject the supplier to the cancellation of the PO and all other contracts with BEML and also to payment of any loss or damage resulting from any such cancellation to like extent as is provided in case of cancellation under **Clause-15** hereof. Any question or dispute as to the committing of any offence under the present clause shall be settled by BEML in such manner and on such evidence of information as they may think fit and sufficient and their decision shall be final and conclusive.

### **33. FORCE MAJEURE CLAUSE:**

Notwithstanding anything contained in the Contract, neither the Supplier nor the Purchaser shall be held responsible for total or partial non-execution of any of the contractual obligations, shall the obligation become unreasonably onerous or impossible due to occurrence of a 'Force Majeure' conditions which directly affect the obligations to be performed by the Purchaser or the Supplier. Such events include war, military operations of any nature, blockages, revolutions, insurrections, riots, civil commotions, insurgency, sabotage, acts of public enemy, fires, explosion, epidemics, quarantine restrictions, floods, earthquake, or acts of God, restrictions by Govt. authorities over which the Supplier or the acts on which the Purchaser has no control.

The party claiming to be affected by Force Majeure shall notify the other party in writing without delay, within two weeks on the intervention and on the cessation of such circumstance. Extension of time sought by the Supplier along with supporting evidence and so granted by the Purchaser for the supply / work affected, if any, shall not be construed as waiver in respect of remaining deliveries. In the case of vendor seeking force majeure then it is discretion of BEML to consider the same based on authenticate document.

Notwithstanding above provisions, Purchaser shall reserve the right to cancel the order/ Contract, wholly or partly, in order to meet the overall delivery schedule and make alternative arrangements including arrangements with third party for completion of deliveries and other schedules. Purchase may takeover partly processed material at a mutually agreed price.

**34. FALL CLAUSE:**

- a) The prices charged for the stores supplied under this P.O by the supplier shall in no event exceed the lowest price at which the supplier sells the stores of identical description to any other BEML Office / Division during the pendency of this PO.
- b) If at any time, during the said period, the supplier reduces the sale price of such stores or sells such stores to any other BEML Office / Division at a price lower than the price chargeable under this P.O and the price payable under this PO for the stores supplied after the date of coming into force of such reduction shall stand correspondingly reduced.

**35. NON-DISCLOSURE AND INFORMATION OBLIGATIONS:**

The supplier shall provide Purchaser with all information pertaining to the delivery in so far as it could be of importance to Purchaser. The Supplier shall not reveal confidential information to its own employees not involved with the tender / Contract & its execution and delivery or to third parties. The supplier shall not be entitled to use the Purchaser's name in advertisements and other commercial publications without prior written permission from Purchaser.

**36. ASSIGNMENT OF RIGHTS AND OBLIGATIONS; SUBCONTRACTING:**

The supplier is not permitted to sub-contract the delivery or any part thereof to third parties or to assign the rights and obligations resulting from this agreement in whole or in part to third parties without prior written permission from Purchaser. Any permission or approval given by the Purchaser shall, however, not absolve the supplier of the responsibility of his obligations under the contract.

**37. DIVISION OF PATRONAGE:**

BEML at its discretion reserves the right to issue order for 100% quantity on L1 or on division of Patronage. BEML reserves the right to avail the price offered for full quantity of the tender or part thereof or ignore the offer completely without assigning any reason whatsoever.

**38. INTEGRITY PACT:**

The bidder / contractor should upload duly signed & stamped **Integrity Pact** (if the tender value is more than or equal to Rs.1.00 crore) as per prescribed format (**APPENDIX- A**) on plain paper as part of technical bid.

The bidder should put their authorized signature in the Integrity pact as a Contractor / bidder with their company seal along with witness's signature, name & address. **The agreement shall be in full as per format enclosed on a plain A4 size paper duly signed & stamped on all pages.**

The Integrity Pact envisages an agreement between the prospective tenderer and the buyer committing the persons/officials of both the parties not to exercise any corrupt influence on any aspect of the contract.

For the successful bidder, the integrity pact will remain valid up to 12 months after the last payment under the contract, and for all other Bidders 6 months after the contract has been awarded.

**The Central Vigilance Commission (CVC) has appointed Shri Kasividyasagar & Shri Lt. Gen. Abhay Krishna as Independent External Monitor (IEM) to oversee the implementation of the Integrity Pact.**

**Address of IEM is as below:-**

Shri Kasividyasagar, IAS (Retd.)  
House no. 55,  
Dream valley gated community,  
Manikonda, Hyderabad – 500089.  
Mobile no: +91 9771407778  
Email: kasividyasagar@gmail.com

Shri Lt. Gen. Abhay Krishna, (Retd.)  
4A-902, Gurjinder Vihar,  
AWHO Township, Sector CHI-1  
Greater Noida, UP - 201310  
Mobile no: +91 9871234353  
Email: abhayabk@gmail.com

**39. GST TERMS & CONDITIONS:**

1. The Supplier is required to comply with all the applicable provisions of the GST Laws/Rules/Notifications/Circulars and to furnish required documents/details within the prescribed time limit to enable BEML to claim the benefits of GST Input Tax Credit or any other benefit.
2. The Supplier is required to furnish proper Invoice/Supplementary Invoice/Debit Note/Credit Note in the form and manner prescribed under GST Laws/Rules/Notifications/Circulars containing all the particulars mentioned therein and within the prescribed time limit as per prevailing GST Laws/Rules/Notifications/Circulars. In case of non-compliance by the Supplier, BEML shall not make any payment towards GST against such invoice until it is complied with within the timeline prescribed under GST Laws/Rules/Notifications/Circulars, and also subject to BEML being in a position to avail GST Input Tax Credit as per applicable GST Laws/Rules/Notifications/Circulars.
3. In case of discrepancy in the data uploaded by the Supplier in the GSTN portal or in case of any shortages or rejection in the supply, BEML will notify the Supplier of the same. Supplier has to rectify the data discrepancy in the GSTN portal or issue Credit note (details to be uploaded in GSTN portal) for the shortages or rejections in the supplies, within the prescribed time limit to enable BEML to avail GST Input Tax Credit.
4. In case, the availment of GST Input Tax Credit by BEML is delayed for any reason other than those attributable to BEML, interest at applicable rate as prescribed under GST Laws/Rules/Notifications/Circulars for such delays shall be recovered from the Supplier.
5. In case Supplier delays declaring such invoice in his GST Return and GST Input Tax Credit availed by BEML is denied or reversed subsequently as per GST Laws/Rules/Notifications/Circulars, GST amount paid by BEML towards such reversal as per GST Laws/Rules/Notifications/Circulars shall be recoverable from Supplier along with applicable interest.

If BEML has not paid/short paid to the Supplier for any invoices within the time limit prescribed under GST Laws/Rules/Notifications/Circulars due to non-compliance of GST Laws/Rules/Notifications/Circulars by Supplier or any other reason attributable to Supplier and

leads to any GST Input Tax Credit reversal by BEML, any losses/expenses/cost/penalty, etc., incurred by BEML shall be recoverable from the Supplier.

6. Wherever applicable, BEML will have the right to deduct “Tax Deducted at Source” at the rate prescribed under the GST Laws/Rules/Notifications/Circulars and to remit the same to the Government
7. In case of supplies made under Reverse Charge Mechanism, the Supplier needs to comply with the provisions under the GST Laws/Rules/Notifications/Circulars in terms of supply of Goods/Services and raising of invoice, so as to enable BEML to remit applicable GST to Govt., within the prescribed time limit and avail GST Input Tax Credit on the same. If the Supplier fails to comply with the above and as a result if BEML incurs any losses/expenses/cost/penalty, BEML shall be entitled to recover the same from the Supplier. Further the Supplier has to mention that “the liability of payment of GST amounting to Rs ..... is on the Recipient of Service” in the invoice raised on BEML.
8. The Supplier is required to comply with the E-Way Bill Provisions under GST Laws/Rules/Notifications/Circulars. If the Supplier fails to comply with the said provisions and as a result if BEML incurs any losses/expenses/cost/penalty, BEML shall be entitled to recover the same from the Supplier.
9. In case of materials/goods issued to Supplier for Job Work, the Job Work Supplier is required to return the goods within the time limit prescribed in the Purchase Order. If the Job Work Supplier fails to return the goods as above, BEML will be entitled to raise a GST Supply Invoice on the Job Worker Supplier with applicable interest as per the provisions of GST Laws/Rules/Notifications/Circulars. In such cases, BEML will be entitled to recover all such GST/interest on GST /losses/expenses/cost/penalty, etc. incurred by BEML along with interest from the Job Work Supplier. Further in such cases where the GST invoice has been raised by BEML, on return of such goods after the prescribed time limit, the Job Work Supplier needs to return the same under GST invoice.
10. The Supplier have the option to give one Bank Guarantee of appropriate value after considering his estimated value of GST involved in invoices raised on BEML instead of Bank Guarantee for each Contract/Invoice. In case of payment through LC, suitable provisions/clause will be inserted while opening LC to ensure compliances of above conditions. However, if at any point of time value of such Bank Guarantee falls short of GST plus interest thereof, Supplier will have to either furnish Bank Guarantee for Differential value or such shortfall value of Bank Guarantee vis-à-vis GST plus interest thereof shall be withheld till Suppliers fulfils its obligations specified under above clauses.

BEML will be entitled to recover all losses/expenses/cost/penalty, etc. incurred by BEML along with applicable interest from the Supplier due to reasons other than those attributable to BEML.

11. If the Supplier is a Composition/Unregistered Dealer, the Supplier needs to comply with the provisions under the GST Laws/Rules/Notifications/Circulars in terms of supply of Goods/Service and raising of invoice. In case, the Supplier fails to comply with the above and as a result if BEML incurs any losses/expenses/cost/penalty, BEML shall be entitled to recover the same from the Supplier along with applicable interest.

#### 40. TAX CLAUSE:

Any tax and/or duty, which may hereafter be imposed outside India, shall be on Supplier's account. **On the other hand, any tax and/or duty, which may hereafter be imposed in India, shall be on BEML's account.** Notwithstanding the foregoing, tax on supervising fee and/or other training fees shall be on

Supplier's account, however, it shall be withheld and paid by BEML in India on behalf of Supplier according to provisions of the corporation tax law, the local inhabitant tax law and convention between Republic of India and the respective Suppliers country, for the avoidance of double taxation and the prevention of fiscal evasion with respect to taxes on income.

Where the government of the supplier's country exempts goods in export from any or all of such taxes, levies, duties on imports, the supplier shall charge the purchase price, which are exclusive of and free from such taxes, levies, and duties on imports.

Any downward revision in taxes or duties imposed in supplier's country should be informed and that benefit should be passed on to the BEML.

Any increase in statutory levies during the period wherein supplier has defaulted to effect supplies as per delivery schedule indicated in contract has to be borne by the supplier.

HSN CODE/CHAPTER ID and SAC Code details are to be indicated against each item.

TDS (Tax deducted at source) will be applicable for service purchase orders and will be deducted as per law of land. SAC (Service Account code) shall be indicated for the services /NRC that will be carried out by the supplier.

#### **41. PROJECT IMPORT REGISTRATION:**

Customs duty on input content imported by domestic bidders to manufacture tendered items.

Chennai Metro Rail Project is eligible for the concessional rate of custom Duty under chapter 98.01 of Custom Tariff Act for Project Import registration mode. In case if an indigenous supplier imports some items from outside India, the firm has to register with customs for availing concessional rate of duty i.e. 7.5% BCD plus cess, through project import registration mode.

To avail the concessional customs duty benefit, Bill of Material (BOM) of such imported material in the prescribed template (containing part number, description, qty, price, source of supply, mode of shipment – Air/Sea, port of arrival etc.,) should be submitted by bidders to BEML within 02 months from finalization of the contract for obtaining PIR sponsoring letter from CMRL. The PIR sponsoring letter should be registered by the bidders with the concerned Customs Authorities at designated Port of Arrival.

The supplier shall maintain details of concessional Custom Duty deposited with the authority and submit the following for reimbursement of Custom Duty: -

- i) Bills of Entry
- ii) Challan for deposit of Custom Duty
- iii) Declaration that the Sub-contractors/Sub-vendors have neither claimed the deemed export benefit nor they will claim the same.

#### **42. INSURANCE:**

BEML has insured the Material being procured and the risk Coverage under the MCE policy shall commence from the moment of the first goods/consignments are lifted, mechanically or manually or otherwise, from anywhere in the world for loading onto the transport (all modes included) and remain in force during transit up to BEML's works and designated CMRL depot available till handing over of equipments with 24 months DNP/DLP.

#### **43. RETENTION MONEY:**

Retention money shall be deducted at the rate of 5% of Invoice, excluding taxes & duties, in respective currencies and up to the cumulative value equal to 5% of the Accepted Contract Amount, excluding taxes & duties.

Upon the request of the Supplier, the purchaser may release the withheld retention money on submission of Bank Guarantee for an equivalent amount in respective currencies from a Public sector bank (PSB) of India or Scheduled Commercial Banks in India or any Japanese Bank as listed under Schedule of Commercial Banks by The Reserve Bank of India (RBI),

Upon completion of DLP / DNP of subject item, Retention money amount or the Retention money Bank Guarantees shall be certified BEML T&C with concurrence of CMRL for releasing to the Supplier.

#### **44. SERVICE SUPPORT:**

**The firm has to provide the service support during CMC period from India. In case of Foreign suppliers, the firm has to submit the undertaking that service support during CMC period will be provided from India.**



### ANNEXURE – III: KEY DELIVERY DATES (CMRL)

1	2	3	4	
Sl.No	Key Date Description	End date of Completion as required by end used CMRL based on ARE02A contract	Delay Damages that will be levied from supplier for each day of delay beyond end date as in column 3 (INR Lakhs per day)	
			1 to 28 days	From 29 <sup>th</sup> day onwards
1	Submission of Final Design Documents, Design , Approval with NONO/NOWC, Manufacturing, FAT, Delivery of DM&P at site (CMRL Depot)	15 <sup>th</sup> Feb 2026	INR 1 Lakh per day	INR 10 Lakh per day
2	Completion of Installation, Commissioning, Testing, Trails, Training, Handing Over at site (CMRL Depot).	15 <sup>th</sup> Jun 2026	INR 1 Lakh per day	INR 10 Lakh per day

*(To be executed on plain paper and applicable for all tenders of value \_ Rs. 1 Crore and above)*

## INTEGRITY PACT

Between

**BEML Limited (BEML) herein after referred to as  
“The Principal”**

And

.....herein after referred to as  
**“The Bidder/Contractor”**

### Preamble

The Principal intends to award, under laid down organizational procedures, contract/s for

..... The Principal values full compliance with all relevant laws of the land, rules, regulations, economic use of resources and of fairness/transparency in its relations with its Bidder(s) and/ or Contractor(s). In order to achieve these goals, the Principal will appoint an independent External Monitor (IEM), who will monitor the tender process and the execution of the contract for compliance with the principles mentioned above.

### Section 1 – Commitments of the Principal

- (1) The Principal commits itself to take all measures necessary to prevent corruption and to observe the following principles:
  - a) No employee of the Principal, personally or through family members, will in connection with the tender for, or the execution of a contract, demand, take a promise for or accept, for self or third person, any material or immaterial benefit which the person is not legally entitled to.
  - b) The Principal will, during the tender process treat all Bidder(s) with equity and reason. The Principal will in particular, before and during the tender process, provide to all Bidder(s) the same information and will not provide to any Bidder(s) confidential/ additional information through which the Bidder(s) could obtain an advantage in relation to the tender process or the contract execution.
  - c) The Principal will exclude from the process all known prejudiced persons.
- (2) If the principal obtains information on the conduct of any of its employees which is a criminal offence under the IPC/PC Act, or if there be a substantive suspicion in this regard, the Principal will inform the Chief Vigilance Officer and in addition can initiate disciplinary actions.

### Section 2 – Commitment of the Bidder(s)/ contractor(s)

- (1) The Bidder (s)/Contractor(s) commit themselves to take all measures necessary to prevent corruption. He commits himself to observe the following principles during his participation in the tender process and during the contract execution.

- a) The Bidder(s)/Contractor(s) will not, directly or through any other person or firm, offer, promise or give to any of the Principal's employees involved in the tender process or the execution of the contract to any third person any material or other benefit which he/she is not legally entitled to, in order to obtain in exchange any advantage of any kind whatsoever during the tender process or during the execution of the contract.
  - b) The Bidder(s)/Contractor(s) will not enter with other Bidders into any undisclosed agreement or understanding, whether formal or informal. This applies in particular to prices, specifications, certifications, subsidiary contracts, submission or non-submission of bids or any other actions to restrict competitiveness or to introduce cartelization in the bidding process.
  - c) The Bidder(s)/Contractor(s) will not commit any offence under the relevant IPC/PC Act; further, the Bidder(s) /Contractor(s) will not use improperly, for purposes of competition or personal gain, or pass on to others, any information or documents provided by the Principal as part of the business relationship, regarding plans, technical proposals and business details, including information contained or transmitted electronically.
  - d) The Bidder(s)/Contractor(s) of foreign origin shall disclose the name and address of the Agents/ Representatives in India, if any. Similarly, the Bidder(s)/ Contractor(s) of Indian Nationality shall furnish the name and address of the foreign Principals, if any. Further, as mentioned in the "Guidelines on Indian Agents of Foreign Suppliers" shall be disclosed by the Bidder(s)/Contractor(s). Further, as mentioned in the Guidelines all the payments made to the Indian agent/representative have to be in Indian Rupees only. Copy of the "Guidelines on Indian Agents of Foreign Suppliers" is placed at **Appendix (A-1)**.
  - e) The Bidder(s)/Contractor(s) will, when presenting his bid, disclose any and all payments he has made, is committed to or intends to make to agents, brokers or any other intermediaries in connection with the award of the contract.
- (2) The Bidder(s)/Contractor(s) will not instigate third persons to commit offences outlined above or be an accessory to such offences.

### **Section 3 – Disqualification from tender process and exclusion from future contracts**

If the Bidder (s)/Contractor(s), before award or during execution has committed a transgression through a violation of Section 2, above or any other form such as to put his reliability or creditability in question, the Principal is entitled to disqualify the Bidder(s)/Contractor(s) from the tender process or act as per the procedure mentioned in the "Guidelines on Banning of business dealings".

### **Section 4 – Compensation for Damages**

- (1) If the Principal has disqualified the Bidder(s) from the tender process prior to the award according to Section 3, the Principal is entitled to demand and recover the damages equivalent to Earnest Money Deposit/Bid Security.
- (2) If the Principal has terminated the contract according to Section 3, or if the Principal is entitled to terminate the contract according to Section 3, the Principal shall be entitled to demand and recover from the Contractor liquidated damages of the contract value or the amount equivalent to Performance Bank Guarantee.

## **Section 5 – Previous Transgression**

- (1) The Bidders declares that no previous transgressions occurred in the last three years with any other Company in any country conforming to the anti-corruption approach or with any other Public Sector Enterprises in India that could justify his exclusion from the tender process.
- (2) If the Bidder makes incorrect statement on this subject, he can be disqualified from the tender processor action can be taken as per the procedure mentioned in “Guidelines on Banning of business dealings”.

## **Section 6 – Equal treatment of all Bidders /Contractors /Sub-contractors**

- (1) The Bidder(s)/Contractor(s) undertaker(s) to demand from all sub contractors a commitment in conformity with this Integrity Pact, and to submit it to the Principal before contract signing.
- (2) ThePrincipalwillenterintoagreementwithidenticalconditionsasthisonewithall Bidders, Contractors and subcontractors.
- (3) The Principal will disqualify from the tender process all bidders who do not sign this Pact or violate its provisions.

## **Section 7 – Criminal charges against violating Bidder(s)/ Contractor(s) / Subcontractor(s)**

If the Principal obtains knowledge of conduct of a Bidder, Contractor or Subcontractor, or of an employee or a representative or an associate of a Bidder, Contractor or Subcontractor which constitutes corruption, or of the Principal has substantive suspicion in this regard, the Principal will inform the same to the Chief Vigilance Officer

## **Section 8 – Independent External Monitor/ Monitors**

- (1) ThePrincipalappointscompetentandcredibleIndependentExternalMonitorforthisPact.  
  
The task of the Monitor is to review independently and objectively, whether and to what extent the parties comply with the obligations under this agreement
- (2) The Monitor is not subject to instructions by the representatives of the parties and performs his functions neutrally and independently. It will be obligatory for him to treat the information and documents of the Bidders/Contractors as confidential. He reports to the CMD, BEML.
- (3) The Bidder(s)/ Contractor(s) accepts that the Monitor has the right to access without restriction to all Project documentation of the Principal including hat provided by the Contractor. The Contractor will also grant the Monitor, upon his request and demonstration of a valid interest, unrestricted and unconditional access to his project documentation. The same is applicable to Subcontractors. The Monitor is under contractual obligation to treat the information and documents of the Bidder(s)/Contractor(s) /Subcontractor(s) with confidentiality.
- (4) ThePrincipalwillprovidetotheMonitorsufficientinformationaboutallmeetings among the parties related to the Project provided such meeting should have an impact on the contractual relations between the Principal and the Contractor. The parties offer to the Monitor the option to participate in such meetings.
- (5) As soon as the Monitor notices, or believes to notice, a violation of this agreement, he will so inform the Management of the Principal and request the Management to discontinue or take corrective action, or to take other relevant action. The monitor can in this regard submit on-binding recommendations. Beyond this, the Monitor has no right to demand from the parties

that they act in a specific manner, refrain from action or tolerate action.

- (6) The Monitor will submit a written report to the CMD, BEML, within 8 to 10 weeks from the date of reference or intimation to him by the Principal and, should the occasion arise submit proposals for correcting problematic situations.
- (7) If the Monitor has reported to the CMD, BEML, a substantiated suspicion of an offence under relevant IPC/PC Act, and the CMD, BEML has not, within the reasonable time taken visible action to proceed against such offence or reported it to the Chief Vigilance Officer, the Monitor may also transmit this information directly to the Central Vigilance Commissioner.
- (8) The word 'Monitor' would include both singular and plural.

#### **Section 9 – Pact Duration**

This pact begins when both parties have legally signed it. It expires for the Contractor 12 months after the last payment under the contract, and for all other Bidders 6 months after the contract has been awarded. If any claim is made/lodged during this time, the same shall be binding and continue to be valid despite the lapse of this pact as specified above, unless it is discharged/ determined by CMD of BEML

#### **Section 10 – Other provisions**

- (1) This agreement is subject to Indian Law. Place of performance and jurisdiction is the Corporate Office of the Principal, i.e. Bangalore.
- (2) Changes and supplements as well as termination notices need to be made in writing. Side agreements have not been made.
- (3) If the Contractor is a partnership or a consortium, this agreement must be signed by all partners or consortium members.
- (4) Should one or several provisions of this agreement turn out to be invalid, the remainder of this agreement remains valid. In this case, the parties will strive to come to an agreement to their original intentions.
- (5) The bidder shall not approach the Courts while representing the matters to IEMs and he/she will await their decision in the matter.
- (6) In case of joint venture, all the partners of the joint venture should sign the Integrity Pact. In case of sub-contracting, the Principal contractor shall take the responsibility of the adoption of IP by the sub-contractor. It is to be ensured that all sub- contractors also sign IP.
- (7) In the event of any dispute between the management and the contractor relating to those contracts where Integrity Pact is applicable, in case, both the parties are agreeable, they may try to settle the dispute through mediation before the panel of IEMs in a time bound manner. If required, the organization may adopt any mediation rules for this purpose.

In case, the dispute remains unresolved even after mediation by the panel of IEMs, the organization may take further action as per the terms and conditions of the contract.

The fees / expenses on dispute resolution shall be equally shared by both the parties.

- (8) In the event of any contradiction between the Integrity Pact and its Annexure, the Clause in the

integrity pact will prevail

-----  
(For & On behalf of the Principal)

(Office Seal)

Place-----

Date -----

***Witness 1:***  
*(Name & Address)*

-----

-----

-----  
(For & On behalf of Bidder/Contractor)

(Office Seal)

Place-----

Date -----

***Witness 1:***  
*(Name & Address)*

-----

-----

**(Applicable Agents / Suppliers to Sign, Seal & Upload / Submit)**

**GUIDELINES FOR INDIAN AGENTS OF FOREIGN SUPPLIERS**

- 1.0 There shall be compulsory registration of agents for all Global (Open) Tender and Limited Tender. An agent who is not registered with BEML LTD shall apply for registration in the prescribed Application-Form available on *www.bemlindia.in*.
- 1.1 Registered agents will file an authenticated Photostat copy duly attested by a Notary Public/Original certificate of the principal confirming the agency agreement and giving the status being enjoyed by the agent and the commission/remuneration/salary/retainership being paid by the principal to the agent before the placement of order by BEML LTD.
- 1.2 Wherever the Indian representatives have communicated on behalf of their principals and the foreign parties have stated that they are not paying any commission to the Indian agents, and the Indian representative is working on the basis of salary or as retainer, a written declaration to this effect should be submitted by the party (i.e. Principal) before finalizing the order.
- 2.0 DISCLOSURE OF PARTICULARS OF AGENTS/REPRESENTATIVES IN INDIA, IF ANY:
- 2.1 Tenderers of Foreign nationality shall furnish the following details in their offer:
  - 2.1.1 The name and address of the agents/representatives in India, if any and the extent of authorization and authority given to commit the Principals. In case the agent/representative be a foreign Company, it shall be confirmed whether it is real substantial Company and details of the same shall be furnished.
  - 2.1.2 The amount of commission/remuneration included in the quoted price(s) for such agents/representatives in India.
  - 2.1.3 Confirmation of the Tenderer that the commission/remuneration if any, payable to his agents/representatives in India, may be paid by BEML LTD in Indian Rupees only.
- 2.2 Tenderers of Indian Nationality shall furnish the following details in their offers:
  - 2.2.1 Then amend address of the foreign principals indicating their nationality as well as their status, i.e, whether manufacturer or agents of manufacturer holding the Letter of Authority of the Principal specifically authorizing the agent to make an offer in India in response to tender either directly or through the agents/representatives.
  - 2.2.2 The amount of commission/remuneration included in the price(s) quoted by the Tenderer for himself.
  - 2.2.3 Confirmation of the foreign principals of the Tenderer that the commission/remuneration, if any, reserved for the Tenderer in the quoted price(s), may be paid by BEML LTD in India in equivalent Indian Rupees on satisfactory completion of the Project or supplies of Stores and Spares in case of operation items.
- 2.3 In either case, in the event of contract materializing, the terms of payment will provide for payment of the commission/remuneration, if any payable to the agents/representatives in India in Indian Rupees on expiry of 90 days after the discharge of the obligations under the contract.
- 2.4 Failure to furnish correct and detailed information as called for in paragraph-2.0 above will render the concerned tender liable to rejection or in the event of a contract materializing, the same liable to termination by BEML LTD. Besides this there would be a penalty of banning business dealings with BEML LTD or damage or payment of a named sum.

Signature  
(For & On behalf of Bidder/Contractor)

## COMPLIANCE REPORT FOR PROCUREMENT TECHNICAL SPECIFICATION (PTS)

Compliance to PTS GR/TD/7721				
PTS SL. No	Description	Complied	Not Complied	Remarks
1	Introduction			
2	Definitions and Abbreviations			
3	Precedence of Documents			
4	Eligibility criteria			
5	General Requirements			
6	Technical requirements (Ref : Clause 2.1 of ERTS-DM&P Part-2, Section-B)			
7	Interface Management			
8	Training			
9	Maintenance, Spares and Consumables during DLP			
10	Commitment beyond DLP Period:			
11	Availability During DLP Period			
12	DNP / DLP / Warranty			
13	List of Enclosures			
14	Submittals with Technical Offer			

Authorized signatory with company seal / stamp



**COMPLIANCE REPORT OF GENERAL TERMS & CONDITIONS**

(To be submitted along with Technical Bid)

**Bid Invitation No** :**Firm** :**Item details** :

Sl. No.	Terms / Clause	Complied	Not Complied	Remarks
1.	GLOSSARY, DEFINITIONS & INTERPRETATIONS			
2.	SUBMISSION OF THE TENDER			
3.	SUPPLIERS SHARING LAND BORDER WITH INDIA			
4.	PREFERENCE TO MAKE IN INDIA			
5.	DELIVERY TERMS			
6.	PAYMENT			
7.	PRICE BID VALIDITY			
8.	FIRM PRICE			
9.	INSPECTION			
10.	WARRANTY			
11.	PERFORMANCE BANK GUARANTEE (PBG)			
12.	RIGHT TO VARY QUANTITIES & QUANTITY OPTION CLAUSE			
13.	LIQUIDATED DAMAGES CLAUSE			
14.	RISK PURCHASE CLAUSE			
15.	SECRECY AND CONFIDENTIALITY			
16.	AUTHORITY OF PERSONS SIGNING DOCUMENT			
17.	ACCEPTANCE OF ORDER			
18.	OTHER CONDITIONS			
19.	PRICE, INVOICING AND PAYMENT			
20.	PROGRESS REPORT			
21.	QUALITY & WORKMANSHIP			
22.	QUALITY, CONDITION OF DELIVERY			
23.	SUPPLY OF SAMPLE (If Applicable)			

Authorized signatory with company seal / stamp

**COMPLIANCE REPORT OF GENERAL TERMS & CONDITIONS**

(To be submitted along with Technical Bid)

**Bid Invitation No** :**Firm** :**Item details** :

24.	INSPECTION, TESTING & CONSEQUENCE OF REJECTION			
25.	RAWMATERIALS ARRANGEMENT			
26.	IDENTIFICATION OF ITEMS / PIECES			
27.	PACKING AND MARKING			
28.	APPLICABLE LAWS AND JURISDICTION OF COURTS			
29.	JURISDICTION			
30.	ARBITRATION			
31.	INTELLECTUAL PROPERTY RIGHTS; LICENSES			
32.	BRIBES AND GIFTS			
33.	FORCE MAJEURE CLAUSE			
34.	FALL CLAUSE			
35.	NON-DISCLOSURE AND INFORMATION OBLIGATIONS			
36.	ASSIGNMENT OF RIGHTS AND OBLIGATIONS; SUBCONTRACTING			
37.	DIVISION OF PATRONAGE			
38.	INTEGRITY PACT			
39.	GST TERMS & CONDITIONS			
40.	TAX CLAUSE			
41.	CUSTOMS DUTY ON INPUT CONTENT			
42.	INSURANCE			
43.	RETENTION MONEY			
44.	SERVICE SUPPORT			

**Authorized signatory with company seal / stamp**

**COMMITTEMENT TO SUPPLIES**

(To be submitted along with Technical Bid)

This is to certify that we M/s ..... against GeM tender No./SRM tender No..... as a Bidder commit that we will support BEML for requirement of any additional Equipment, Spares, Service required at the later stage i.e. from taking over of supplied equipment and upto completion of atleast 15 years from commissioning for all the equipment supplied.

**Authorized signatory with company seal / stamp**

**CONFIDENTIALITY AGREEMENT****(To be typed on plain paper and submitted along with the technical bid)**

This Confidentiality Agreement is made and entered into between M/s BEML, (hereinafter referred to as BEML), a Govt. of India Undertaking under Ministry of Defence, having its Registered Office at BEML Soudha, No.18/1, 4th Main, Sampangirama Nagar, Bangalore – 560 027 and M/s ----- (hereinafter referred as XXXX) having its Registered Office at..... M/s. BEML, has been patronizing XXXX for components / spares listed in Annexure hereto. A need has been felt to revitalize the business relationship for mutual advantage.

- 1) It is mutually, therefore, agreed that the following shall form part of the terms and conditions for continued business:
  - a) The supplier shall not divulge to anyone else except under the authority and for the purpose of BEML, all information such as technical data, specifications, drawings, models of specimens furnished / supplied by BEML for the purpose of manufacture or in connection with developmental activities, constitute the property of BEML and the supplier shall keep them in strict confidence. This has been explicitly stated in all the details to the supplier through Purchase Order / Drawings etc., released.
  - b) The supplier shall not supply the components / spares exclusively manufactured for BEML with the Technical Data / Specifications / assistance furnished by BEML and shall not disclose my initiations, development of adaptations thereof to anyone else except with the written consent of BEML.
  - c) BEML shall be entitled to prevent breach of the above and to claim damages in case of any breach. It is hereby mutually agreed that for breach of this agreement the Vendor shall pay, without actual proof of damages, a liquidated amount of Rs. 1.00 Crore (Rupees One Crore only).
  - d) **ARBITRATION:** Any disputes and differences that may arise between the parties in connection with this Agreement/Contract shall be settled by the parties amicably by way of mutual discussion / negotiation / conciliations. In case parties fail to settle the dispute amicably, then the dispute or difference shall be referred to India International Arbitration Centre for resolution. The Arbitration Tribunal shall consist of Sole / three Arbitrator /s. The Arbitrator /s shall be appointed and Arbitration proceeding shall be conducted in accordance with the provision of India International Arbitration Centre (Conduct of Arbitration) Regulations, 2018.
- 2) BEML shall be entitled to prevent breach of the above and to claim damages in case of any breach.
- 3) The Signatories hereto declare that they have the sanction and power to execute and deliver this binding agreement.

IN WITNESS WHEREOF, the parties hereto have set their respective hands to this Confidentiality Agreement on ..... written in the presence of Witness.

**For BEML****For M/s. XXXX****WITNESS:****1.****2.**

**Land Border Sharing Declaration**

**(To be submitted in the bidder's letter head)**

In-line with Department of Expenditure's (DoE) Public Procurement Division Order vide ref.  
F.No.6/18/2019-PPD dated 18.07.2020 & 19.7.2020 and subsequent orders

Tender no. ....

Job: .....

"I/ we have read the clauses pertaining to Department of Expenditure's (DoE) Public Procurement Division Order (Public procurement no 1, 2 & 3 vide ref. F.No.6/18/2019-PPD dated 18.07.2020 & 19.7.2020) regarding restrictions on procurement from a bidder of a country which shares a land border with India. I/We hereby certify that I/ we the bidder < name of the bidder> is / are

a) Not from such a country and eligible to be considered for this tender.

OR

b) From such country, has been registered with the competent authority and eligible to be considered for this tender. (Evidence of valid registration by the competent authority shall be attached)

For and behalf of \_\_\_\_\_ (Name of the bidder)

(Signature, date & seal of authorized representative of the bidder)"

**DECLARATION REGARDING MINIMUM LOCAL CONTENT IN LINE WITH  
REVISED PUBLIC PROCUREMENT (PREFERENCE TO MAKE IN INDIA), ORDER 2017  
DATED 04<sup>TH</sup> JUNE, 2020 AND SUBSEQUENT ORDER(S)**

*(To be typed and submitted in the Letter Head of the Entity/Firm providing certificate as applicable)*

To,  
BEML Limited, Bangalore

Dear Sir,

**Sub:** Declaration reg. minimum local content in line with Public Procurement (Preference to Make in India), Order 2017-Revision, dated 04<sup>th</sup> June, 2020 and subsequent order(s).

**Ref :** 1) NIT/Tender Specification No: .....  
2) All other pertinent issues till date

We hereby certify that the items/works/services offered by.....  
(specify the name of the organization here) has a local content of \_\_\_\_\_ % and this meets the local content requirement for ‘Class-I local supplier’ / ‘Class II local supplier’\*\* as defined in Public Procurement (Preference to Make in India), Order 2017-Revision dated 04.06.2020 issued by DPIIT and subsequent order(s).

The details of the location(s) at which the local value addition is made are as follows:

- |          |          |
|----------|----------|
| 1. _____ | 2. _____ |
| 3. _____ | 4. _____ |

...  
...  
...

Thanking you,  
Yours faithfully,

**(Signature, Date & Seal of  
Authorized Signatory of the Bidder)**

**\*\* - Strike out whichever is not applicable.**

**Note:**

1. Bidders to note that above format duly filled & signed by authorized signatory, shall be submitted along with the techno-commercial offer.
2. In case the bidder's quoted value is in excess of Rs. 10 crores, the authorized signatory for this declaration shall necessarily be the statutory auditor or cost auditor of the company (in the case of companies) or a practicing cost accountant or practicing chartered accountant (in respect of suppliers other than companies) giving the percentage of local content.
3. In the event of false declaration, actions as per the above order necessary action will be taken against bidder.

**Authorized signatory with company seal / stamp**

**CONTACT DETAILS OF THE SUPPLIER****(To be filled and submitted by supplier along with the technical bid)****1) Contact Person details in Marketing Office**

- (a) Name :
- (b) Designation :
- (c) Telephone :
- (d) Fax :
- (e) Mobile :
- (f) Email :

**2) Head Office :****3) Complete address****including the website :****4) Details of the proposed plant from****where item is to be supplied :****5) Complete address of the Plant****including Website :****6) Contact person details in plant**

- (a) Name :
- (b) Designation :
- (c) Telephone :
- (d) Fax :
- (e) Mobile :
- (f) Email :

**7) Bank Details: (Will used during L/C Execution)**

- a) Name of the Bank :
- b) Full Address of the Bank :
- c) Suppliers Account Number and Type :
- b) IBAN No :

**DELIVERY SCHEDULE****Required Delivery Schedule:** Under Floor Wheel Lathe including DNP/DLP

Sl No	Part No / Description	Schedule	Qty.
1	Submission of Final Design Documents , Design Approval with NONO / NOWC, Manufacturing, FAT, Delivery of Under Floor Wheel Lathe (UFWL) at Site (CMRL Depot)	Jan 2026	2
2	Completion of Installation, Commissioning, Testing Trails, Training, Handing over at Site (CMRL Depot)	Mar 2026	2

**Note:****Delivery Address:**

M/s. BEML Limited,

C/o CMRL Madhavaram Depot,

Near Tamil Nadu Veterinary &amp; Animal Science University

Madhavaram,

Chennai – 600051,

Tamil Nadu State, India



## **PERFORMANCE BANK GUARANTEE**

Bank Guarantee No.....  
Dated .....  
Amount .....  
Valid upto .....  
Claim upto .....

The General Manager (Materials- Management)  
BEML  
Bangalore Complex  
PB No 7501  
New Thippasandra  
Bangalore 560075

1. This deed of Guarantee made this day of..... (Month & year) between Bank of ..... (Hereinafter called the "Bank") of the one part, and BEML LIMITED (Herein after called "the Employer") of the other part.
2. Whereas BEML LIMITED has awarded the contract for..... (Name of work as per PO) (Herein after called the "Contract") to..... (Name of the Contractor) (Herein after called "the Contractor").
3. AND WHERE AS the Contractor is bound by the said Contract to submit to the Employer a Performance Security for a total amount of..... (Amount in figures and words).
4. Now, We the Undersigned.....(Name of the Bank) being fully authorized to sign and to incur obligations for and on behalf of and in the name of.....(Full name of Bank), hereby declare that the said Bank will guarantee the Employer the full amount of Rs.....(Amount in figures and words) as stated above.
5. NOW THEREFORE, We hereby affirm that we are the Guarantor and responsible to you, on behalf of the Contractor and we here by unconditionally, irrevocably and without demur undertake to immediately pay to the Employer upon first written demand and without cavil or argument, any sum or sums within limits of.....(Amount of Guarantee)as aforesaid without reference to the Contractor and without your needing to prove or show grounds or reasons for your demand for the sum specified therein. The Bank shall pay to the Employer any money so demanded notwithstanding any dispute/disputes raised by the Contractor in any suit or proceeding spending before any Court, Tribunal or Arbitrator/s relating thereto and the liability under this Guarantee shall be absolute and unequivocal.
6. This Guarantee is valid till ..... (The initial period for which this Guarantee will be valid must be before at least 6-months(six months)longer than the anticipated expiry date of defect liability period / Warranty period as stated in Clause **11** of Annexure IV - Notice Inviting Tenders.
7. At any time during the period in which this Guarantee is still valid, if the Employer agrees to grant a time extensiontotheContractororiftheContractorfailstocompletetheWorks within the time of completion as stated in the Contract, or fails to discharge himself of the liability or damages or debts as statedunderPara5, above, it is understood that the Bank will extend this Guarantee under the same conditions for the required time on demand by the Employer and at the cost of the Contractor.
8. The Bank agrees that no change, addition, modifications to the terms of the Contract Agreement or to any documents, which have been or may be made between the Employer

and the Contractor, will in no way release us from the liability under this Guarantee; and the Bank, hereby, waives any requirement for notice of any such change, addition or modification to the Bank.

9. The Guarantee herein before contained shall not be affected by any change in the Constitution of the Bank or of the Contractor.
10. The neglect for bearance of the Employer in enforcement of payment of any moneys, the payment where of is intended to be here by secured or the giving of time by the Employer for the payment here of shall in no way relieve the bank of their liability under this deed.
11. The expressions "the Employer", "the Bank" and "the Contractor "herein before used shall include their respective successors and assigns.
12. Not with standing anything contained herein:
  - (a) Our liability under this Bank Guarantee shall not exceed Rs.....  
(Rs.....)
  - (b) This Bank Guarantee shall be valid up to.....
  - (c) We are liable to pay the Guarantee amount or part thereof under this Bank Guarantee only & only if you serve up on us a written claim or demand on or before

In witness whereof I/We of the bank have signed and sealed this Guarantee on the.....day of.....(Month & year) being here with duly authorized.

For and on behalf of the.....Bank.

**Signature of Authorized Bank officials.**

Name :.....

Designation : .....

Stamp/Seal of the Bank.....

Signed, sealed and delivered for and on behalf of the Bank by the above named.....in the presence of:

**Witness1.**

Signature.....

Name.....

Address.....

**Witness2.**

Signature.....

Name.....

Address.....

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**CMRL ARE02A**  
**Procurement Technical Specification**  
**For UNDER FLOOR WHEEL LATHE (UFWL)**  
**for CMRL – Madhavaram Depot with 3 Years DLP**

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Approved	24.04.2025	Sasikumar M	
Checked	24.04.2025	Shivakumar SB	
Prepared	23.04.2025	R.Iyyapillai	
	Date	Name	Signature

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### REVISION DETAILS

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## 1. Introduction

This document describes the technical requirement of UNDER FLOOR WHEEL LATHE (UFWL) to be procured by BEML for CMRL Metro Phase 2 Project (Corridor 3, Corridor 4, Corridor 5) contract for Chennai Metro Rail Corporation Limited.

The scope of Works under this contract is for Design, manufacture, Supply, delivery (at Madhavaram depot site), installation, testing and commissioning, training, maintenance, supply of operation & maintenance manuals, supply of spares parts and consumables, Special tools & fixtures, Software for periodic, preventive and corrective maintenance during 3 years DLP and spares support after DLP for 15 years for the Under Floor Wheel Lathe (UFWL) mentioned above at Madhavaram Depot.

### Special Note:

- i. All Depot Machinery and Plant given in the tender scope, shall be utilized for multiple types of rolling stocks. The above depot machinery shall be designed, manufactured, and demonstrate its compatibility during testing commissioning for **multiple rolling stocks** in CMRL phase -II project.
- ii. The Sub-Contractor shall comply with the Interface Requirements (specified in Chapter-4 of this section VIB) and shall undertake all trials, and acceptance tests required to verify the compatibility with **multiple train fleets** at no additional cost to BEML / CMRL. Unless otherwise stated, the clause conditions specified this document shall apply to all the machines listed in Table 1-1, Table 1-2, Table 1-3 & Table 1-4 (Part 2 – Section VIB (Chapter 1)).

## 2. Definitions and Abbreviations

The following definitions and abbreviations are applicable to the PTS.

### 2.1 Definitions

- a) **“Employer”** means Chennai Metro Rail Corporation Limited (CMRL), its legal successors and assignees.
- b) **“Sub-contractor”** means the supplier who supplies the required DM & P equipment to BEML for CMRL ARE02A Project. Sub-contractor shall carry out the works in accordance with ERTS with regard to Under Floor Wheel Lathe (UFWL).
- c) **“Contractor”** means the persons or person appointed by the Employer to undertake the execution of the works for CMRL ARE02A project. In order to avoid misunderstanding of the roles of the Contractor in ERTS, the term “Contractor” shall be read as “Sub-contractor” for those ERTS Clauses referred to in this PTS.
- d) **“Contract”** means the contract between Sub-contractor and BEML in relation to the supply of Under Floor Wheel Lathe for CMRL ARE02A project.
- e) **“Project Manager or Employer’s Representative”** means any person nominated or

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appointed from time to time by the Employer to act as the Project Manager/ Employer's Representative for the purposes of the Contract and notified as such in writing to the Contractor.

- f) "GTC / STC" means General Terms and Conditions for Supply of DM & P equipment for CMRL ARE02A Project issued by BEML.
- g) "**BEML**" means the Contractor to procure the DM & P equipment for CMRL ARE02A project.
- h) "**ERTS**" means Employer's Requirements Technical Specification – Rolling Stock or Employer's Requirements Technical Specification - Comprehensive Maintenance Contract for CMRL ARE02A project as applicable.
- i) "**UFWL**" means UNDER FLOOR WHEEL LATHE
- j) "**PTS**" means BEML's Procurement Technical Specification.

## 2.2 Abbreviations

Abbreviation	Description
AC	Alternating Current
AMS	Asset Management System
ATP	Automatic Train Protection
BIM	Building Information Modelling
BS	British Standard
CAD	Computer Aided Design and Drafting
CD	Compact Disc
CNC	Computer Numerical Control
CMV	Catenary Maintenance Vehicle
CMC	Comprehensive Maintenance Contract
DC	Depot Contractor
DDC	Detail Design Consultants
DM&P	Depot Machinery & Plant
E&M	Electrical & Mechanical
EMC	Electro Magnetic Compatibility
EMI	Electro Magnetic Interference
ES	European Standard
FAT	Factory Acceptance Test
GA	General Arrangement
GC	General Consultants
IMP	Interface Management Plan
IP	Ingress Protection
IT	Information Technology
LAN	Local Area Network

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LED	Light-Emitting Diode
NoNO	Notice of No Objection
OCC	Operational Control Center
OCS	Overhead Catenary System
OEM	Original Equipment Manufacturer
OHE	Over Head Equipment
OHS&E	Operational Health, Safety & Environment
O&M	Operation and Maintenance
PM	Project Manager
QA	Quality Assurance
RS	Rolling Stock
SAT	Site Acceptance Test
SI	International System (of Measurement)
STC	Signalling and Train Control
Telecom	Telecommunication
TRW	Track Works Contractor

### 3. Precedence of Documents

The PTS shall be read in conjunction with the General Terms & Conditions (GTC) of the tender, ERGS and ERTS.

The PTS shall be read in conjunction with the General Terms and Conditions (GTC) of tender and ERTS-RS and ERTS-CMC & DP&M. To the extent that any provision of the PTS is inconsistent with any provision of the GTC, the provisions of the GTC shall prevail.

To the extent that any provision of GTC is inconsistent with any provisions of the ERTS, the provisions of ERTS shall prevail.

This PTS in no way relieves the supplier from any requirements specified in the technical specification. The complete requirements are those found in the aforesaid documents. It shall be the supplier's responsibility to ensure that equipment, documentation, and services furnished against this PTS are in full compliance with all the above documents.

However, if a conflict is discovered among any of the above documents, the following order of priority shall govern:

Order of Precedence	Document Title
1	CMRL Phase-2 ERTS-DM&P and ERTS-CMC
2	GTC
3	PTS



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The complete requirements are those found in the above documents. It shall be the subcontractor's responsibility to ensure that equipment, documentation, and services furnished against this PTS are in full compliance with all the above documents.

Also, in the event of any conflict among the requirements of particular parts of the PTS and ERTS, the subcontractor shall seek clarification with BEML prior to making a contract. After making a contract, the subcontractor shall comply with BEML's Interpretation for any discrepancies.

#### 4. Eligibility criteria

Subcontractors / Manufacturers for the following major item of supply or services must meet the following minimum criteria, herein listed for this item:

SI No.	Minimum Criteria to be met	Form
1.	At least two similar Works, incorporating the requirement for Design, manufacture, Supply, Installation, Testing and Commissioning of <b>Under Floor Wheel Lathe (UFWL)</b> for Metro Rail Projects / LRT / High Speed Rail Network / Railways, satisfactorily completed and in Operation <b>for minimum 2 years</b> in the duration from 1st January 2013 to bid submission end date. Proven-ness certificate (issued by end-user) of working satisfactorily outside the country of origin (for foreign company) or within India shall be submitted by the bidder.	Form Sys-10

**4.1** Failure to comply with this requirement will result in rejection of the Subcontractor.

**4.2** In pursuant to PCC to GCC Clause No. 4.4 of Part 3: Section VIII Particular Conditions (Part B: Specific Provisions), It is a mandatory obligation for the Contractor to obtain a Notice of No Objection (NONO) from the Employer / Engineer for the selection of Subcontractors and/or vendors for all items of Work, including for cases where the Subcontractor and/or vendor had already been named in the Contractor's Technical Bid Proposal (Part 1, Section IV, Bidding Forms, Clause 5.13 : Form SUB - Proposed Subcontractors for Major Items of Plant and Installation Service). Purchase of all materials and equipment shall be in accordance with the Standards specified in Part 2 of the Contract. Where the Contractor had proposed more than One (1) Subcontractor the Employer / Engineer reserves the right to choose the vendor and/or Subcontractor from the proposed list. If the Contractor proposes to subcontract the Depot Machinery and Plant scope, then further subcontracting to major Suppliers / Vendors shall also require the prior approval of the Employer / Engineer.

#### 4.3 Unclear aspects

If any term / clause / definition is unclear in this specification, sub-contractor shall seek clarifications from design team in BEML, prior to signing contract, to confirm the same.

After signing the contract, sub-contractor shall follow the definition and opinion of design team in BEML.

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## 5. General Requirements

### 5.1 Supply of Documents

5.1.1 The Sub-Contractor shall supply to BEML / CMRL a list of deliverables for the procurement, design, manufacture, Inspection, testing, installation, training, maintenance, and operation of the machine.

5.1.2 The Sub-Contractor's list of deliverables shall be submitted to BEML / CMRL as per instruction of Engineer / Employer.

5.1.3 The Sub-Contractor shall submit the following detailed documents for getting notice of no objection from CMRL (but not limited to)

- Compliance matrix
- Master Schedule Programme with all activities for entire Works
- Quality & Safety procedures and plans
- Interface Management Plan and Detailed Interface Documents.
- Detailed Design Submission for respective machine.
- General Arrangement drawing showing mounting arrangement & Foundation Drawing (to interface with depot civil Contractor appropriately).
- Installation, Testing, Commissioning and Training programs
- As-built drawings and Manufacturing drawings
- BIM model and drawings  
The document “**BIM GUIDELINES FOR ASSET INFORMATION MODEL**” (Enclosure-6) shall be followed to submit the BIM model of the Depot M&P equipment in Autodesk Revit format to ensure its compliance with asset requirements & specified guidelines.


5.1.4 Manuals: The Sub-Contractor shall submit the following detailed manuals and documents for getting notice of no objection from CMRL.

- Installation / Erection manual
- Operations manual
- Training manual
- Preventive Maintenance Manual
- Trouble shooting Manual
- Testing & Commissioning manual
- Electrical and pneumatic schemes
- Spare parts catalogue including supplier details

### 5.2 Installation, Inspection, Testing & Commissioning

#### 5.2.1 General Requirements

- The Sub-Contractor shall put in place a full testing program to demonstrate that all the requirements of the Specification are met.
- The Sub-Contractor shall develop an Integration Testing & Commissioning plan to verify the machines in all modes of operation and with all necessary interfacing requirements. Test programs, methods and results shall be documented and submitted to BEML / CMRL.
- The Sub-Contractor shall include in the Integration Testing & Commissioning plan, methodology

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of ensuring safety during integration testing and commissioning and service trials.

d) BEML / CMRL may conduct independent safety audits and will therefore require access to all the relevant design and product information. The Sub-Contractor shall provide all necessary assistance to BEML / CMRL.

e) All the tests shall be carried out by the Sub-Contractor. BEML / CMRL shall be invited to attend as a witness. However, this does not absolve the Sub-Contractor's responsibility to test to the applicable standard and the Specification. All the costs associated with the BEML / CMRL's representative(s) witnessing of tests shall be borne by the BEML / CMRL either in India or abroad.

f) During the execution of works, the Sub-Contractor 's support shall include, but not be limited to:


- i) Provision of test equipment.
- ii) Attendance of competent staff.
- iii) Provision of test procedures.
- iv) BEML / CMRL may request that repeat tests be carried out to simulate the failure mode of any critical hardware / software component that is deemed to have a significant effect on the safety or reliability of the system.
- v) The Sub-Contractor shall provide any simulation equipment, required for testing or commissioning.
- vi) The Sub-Contractor shall submit a Testing and Commissioning program for the BEML / CMRL's review.
- vii) The Sub-Contractor shall provide details of the testing activities as specified in the Specification.
- viii) All alterations to equipment, systems and designs shall be carried out within the scheduled time prior to installation & commissioning.
- ix) Access shall be granted to the BEML / CMRL to any facility where installation, cutover work, or other tests are in progress.
- x) BEML / CMRL reserves the right to access at any time the records of all pre and post installation inspection and testing of equipment. In the absence of adequate documentation, BEML / CMRL shall have the right to request the Sub-Contractor to repeat these tests to avoid problems being accumulated at subsequent phases. Testing and commissioning will not be allowed to start until the Post Installation Inspection and Testing phases are completed.

### 5.2.2 Sequence of Tests

a) Type Tests is not required to be performed. However previous type test reports of similar Design shall be submitted for information of BEML / CMRL.

b) Factory Acceptance Tests (FAT):

- i) Factory acceptance test plan shall be submitted for BEML / CMRL's review. The plan shall adopt a top-down approach and describe the FAT strategy as regards to methodology, procedures to be followed and records to be submitted. Sub-Contractor shall submit the comprehensive list of specifications to be followed.
- ii) FAT plan / submission shall include the appropriate testing and inspection items for Notice of No Objection.
- iii) FAT shall demonstrate that each machine/subsystem meets its functional specification. Prerequisites, if any shall be made available by the Sub-Contractor at his own cost. For example, for UFWL FAT, a suitable wheel set should be made available

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by the Sub-Contractor / manufacturer at his facility for demonstrating the capabilities of the machine.

iv) No equipment or software should be delivered to the Site until the Sub-Contractor has demonstrated to the satisfaction of the BEML / CMRL that the equipment or software conforms to the Specification by carrying out the FAT.

v) The Site for the FAT of equipment shall be notified to the BEML / CMRL 60 days prior to commencement of the FAT. BEML / CMRL shall have the right to witness or waive- off the FAT.

vi) Cost related to travel and stay of BEML / CMRL representatives during FAT at manufacturer site as per FAT Program will be borne by BEML / CMRL.

vii) In case of failure of FAT, the Sub-Contractor shall be responsible for arranging Re-FAT and all the cost incurred associated with travel, accommodation, food visas and permits for BEML / CMRL and GC.

### 5.2.3 Pre-installations tests and inspection

a) Prior to installation, the Sub-Contractor shall ensure that equipment delivered to Site has not been damaged in transit. Inspection and testing shall be conducted by the Sub-Contractor to determine that the equipment has not been damaged or the performance impaired in any manner subsequent to shipment.

b) Test procedures shall be carefully planned to ensure that the work can be completed within the time available. If the time available is restricted, this planning shall include a contingency plan to be implemented if testing proceeds slower than anticipated or defects are identified, which cannot be corrected.

c) The Sub-Contractor shall submit to BEML / CMRL a site preparation plan before installation.

d) The Sub-Contractor shall prepare the site in all respects required for installation.

### 5.2.4 Post Installation Tests

a) Site tests shall be carried out in order to verify that the installations are correct and that, when the system as a whole is connected together, they function safely as an integrated system.

b) All tests shall be documented, and tests results recorded. Test certificates with completed test records, which demonstrate equipment and components meet the performance requirements of the specification, shall be submitted for information.

c) Post Installation tests shall be carried out by the Sub-Contractor before Functional Tests to demonstrate that the installation has been carried out correctly.

d) The Sub-Contractor shall submit a Post Installation Inspection and Testing Plan prior to the commencement of the post installation inspection and testing.

e) Inspection shall verify that equipment has been installed to the procedures and designs that have received no objection from the BEML / CMRL, and equipment is correctly located and labelled.

f) Inspection shall verify that any false feed, temporary wiring, and redundant items have been removed and that equipment is correctly protected against interference, damage and deterioration.

g) The Sub-Contractor shall maintain inspection records to demonstrate that each item of equipment has been inspected and found to be satisfactory and attach to this record a detailed list of any discrepancies found and remedial work carried out. Inspection records shall be kept for all installed equipment and a detailed list attached of any discrepancies.

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h) As the discrepancies are rectified, the record sheets shall be amended to record the corrections.

### 5.2.5 System Acceptance Tests (SAT)

- a) System Acceptance Tests shall comprise comprehensive testing of the completely assembled installation to ensure that every item has been installed, adjusted, and to demonstrate that all machines operate correctly in accordance with the Specification, perform in accordance with the Specification and the local configuration and are available for integration testing & commissioning.
- b) Prior to System Acceptance Testing, the Sub-Contractor shall submit a System Acceptance Plan to the BEML / CMRL for Notice of No Objection. The plan shall adopt a top-down approach and describe the System Acceptance strategies and processes.
- c) System Acceptance Plan shall identify a comprehensive list of specifications, standards, method statements, procedures, drawings and records to be submitted to BEML / CMRL for Notice of No Objection. The Plan shall also include a programme which identifies the dates for system acceptance submission and tests.
- d) Any tests carried out which are deemed as System Acceptance Tests shall be identified. If these tests have been carried out earlier or form the part of earlier carried tests, the same need not be repeated unless desired by the BEML / CMRL. However, these tests should be identified and included in the System Acceptance Test Plan.
- e) These tests shall be conducted in the presence of the BEML / CMRL who may decline for witness.
- f) Any defects which become apparent in the course of these tests shall be made good and modifications as approved shall be implemented and recorded. All affected equipment shall be retested and certified before the system is accepted.
- g) Prerequisites for SAT;
  - i) All documentation for the Safety Report shall be submitted to the BEML / CMRL for a Notice.
  - ii) All SAT shall be completed, and test records submitted to BEML / CMRL for a Notice.
  - iii) Facilities for the maintenance of the System shall be in place.
  - iv) SAT Plan shall be submitted to the BEML / CMRL for a Notice of at least 60 days before the commencement of the SAT.
- h) System Acceptance Test Requirements
  - i) It shall be the Sub-Contractor 's responsibility to conduct all tests and record data and restore the machines to full operational use following the SAT.
  - ii) During the SAT, all interfaces with external systems other than those pertaining to the designated Sub-Contractor shall be tested.

### 5.2.6 Integration Testing and Commissioning

- a) On completion of testing and commissioning of the Sub-Contractor 's own system to the satisfaction of the BEML / CMRL the Sub-Contractor shall carry out all tests necessary to integrate the particular machine with all other systems of BEML / CMRL such as multiple Rolling Stock, Track, Communication / signalling and train control, Overhead Equipment, Civil, etc. and demonstrate correct operation of all internal and external interfaces as applicable.
- b) Integration Testing & commissioning plan containing the schedule of integration tests in coordination with the interface Contractor s and test procedures shall be submitted to the BEML / CMRL for a Notice of No Objection. The tests shall be carried out in coordination with the interface Contractor.

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- c) The Sub-Contractor shall be required to lead in certain Integration Testing and Commissioning where such tests are required to prove the performance of system provided by the Sub-Contractor
- d) All the defects and shortfalls in the Sub-Contractor 's system discovered in the course of Integration Testing and Commissioning shall be made good and retested / performed to the satisfaction of the BEML / CMRL before the issue of Taking Over Certificate by BEML / CMRL.
- e) Testing and commissioning shall be managed without perturbation and/or interruption of operation and maintenance.
- f) BEML / CMRL may require additional tests if needed.

### 5.3. Site Visits & Requirements:

The Tenderer should visit and examine the Site of Supply and its surroundings and obtain for himself on his own responsibility for collecting the complete requirements that may be necessary for preparing the Tender and entering into a Contract for the proposed Supply.

- a). The Tenderer should include Cost of Cables, Cable Routing, Isolator, Circuit Breaker, lightning and all other electrical requirement from main distribution panel to the machine.
- b). The Tenderer shall plan the Foundation & Machine Layout suiting to the Depot Civil layout made by the CMRL. Any civil, E&M & requirements / modifications shall be taken care by the contractor at their own cost.
- c). Machine power rating of Under Floor Wheel lathe (CNC) should be within the power rating of **Load 95 KW & 250 A**. In the event of any conflict among the above requirements, the subcontractor shall seek clarification with BEML / CMRL prior to making a contract.
- d) The costs of visiting the Site shall be borne by the Tenderer. It shall be deemed that the Tenderer has undertaken a visit to the site of Supply and is aware of the site conditions prior to the submission of Tender.
- e) The Tenderer and any of his personnel will be granted permission by BEML / CMRL to enter upon his premises and lands for the purpose of such inspection, but only upon the express condition that the Tenderer and his personnel will release and indemnify the Purchaser and his personnel from and against all liability.
- f) The supplier shall be the responsible for complete installation of the equipment in the depot, tapping of power supply, routing of cable, required material handling equipment, tools, Unloading, erection, commissioning and testing of the equipment as per relevant IS standard.

## 6. Technical requirements (Ref : Clause 2.1 of ERTS-DM&P Part-2, Section-B)

### 6.1 Purpose of the machine

The Under Floor Wheel lathe (CNC) is required for simultaneous profiling of new or worn-out wheels of metro cars in situ. Wheel sets of multiple types of Rolling stock at CMRL Phase-II Madhavaram depot shall be turned on this machine. It shall be equipped with dual CNC tool post for turning any wheel profile along with pre and post measurement system.



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## **6.2 Technical Particulars- Fully Automatic CNC Under Floor Wheel Lathe**

6.2.1 The Contractor shall undertake to comply with the requirements of "Design, Manufacture, Supply, Installation, Testing & Commissioning of One (1) number of Fully Automatic CNC Under Floor Wheel Lathe along with Chip Crusher and Conveyor and other accessories to make the machine fully functional and operational.

6.2.2 Automatic Operation: Automatic means that machine shall have the following minimum features but not limited to, while working in fully automatic model.

- i. Automatic job setting.
- ii. Pre-measurement of the wheel profile and wheel diameter.
- iii. Complete profile turning operation of the wheel and optimization of metal removal by comparison with the stored profile to obtain specified surface finish and accuracy. Options to take partial cut and resultant profile with partial cut shall be determined by the system.
- iv. Post measurement of the wheel profile and wheel diameter.
- v. Display of tread diameters of both wheels of an axle before and after turning.
- vi. All the function shall be carried out by the machine automatically without any interference of operator.
- vii. Programming of a new profile should be possible.
- viii. Not Used
- ix. Placement of car bogie on the Wheel Lathe after interlocking of Shunter with Wheel Lathe.

## **6.3 Detailed Scope of Works**

6.3.1 Design, Manufacture, Supply, Installation, Testing & Commissioning of fully automatic CNC Under Floor Wheel Lathe at Madhavaram Depot of CMRL phase-II. The supply shall include all equipment and accessories required to make the machine fully functional when connected to a power source. The Wheel Lathe shall comply with the configurations of Rolling Stock and Track profile.

6.3.2 Electrical cables for connecting Power point to Control cabinet of machine shall be supplied by the Contractor as per the requirement.

6.3.3 Wheel lathe shall be equipped with all hardware and software (attachments, programmes etc) required for machining / turning of all types of rolling stocks along with its installation testing commissioning etc.

6.3.4 Not Used.

6.3.5 Not Used.

6.3.6 One (1) Laser Printer compatible with PC provided with the CNC Wheel Lathe shall be supplied for report printing.

6.3.7 One calibration wheel set, with its axle and discs painted in yellow colour, shall be supplied by the Contractor along with the Wheel Lathe. The calibration wheel set shall be used for calibration as per recommended frequency mentioned by the manufacturer of the Wheel Lathe. A suitable cover to protect the calibration wheel set from all atmospheric adverse effects shall be supplied.

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6.3.8 Necessary co-ordination shall be made and action taken for interlocking of the Battery Shunters (2 nos) with the Wheel Lathe operation.

6.3.9 The Wheel Lathe shed shall be constructed by the Depot Civil Contractor. The Contractor shall plan the foundation designing in the shed constructed by Depot Civil Contractor.

6.3.10 Back-up of the machine software (CNC programming) for re-profiling, along with a standby hard disc with complete machine standard software shall be provided along with the Wheel Lathe.

6.3.11 UFWL scope of work shall also include following:

- a) Wheel Profile Measurement device (Hand-Held) – 1 set
- b) Instrument (Digital) to check Surface Finish (Ra) – 1no

The Contractor shall supply above devices along with UFWL. Price of above 2 items shall be deemed included in the UFWL price including DLP and CMC services.

#### **6.4 Design Requirements of Wheel Lathe:**

6.4.1 The Equipment shall be of proven design. Major structural elements of the Wheel Lathe, e.g., column, cross rail, tool slide etc. that are subjected to cutting loads, must be cast structural or of welded steel construction, duly stress relieved and shall be designed for atleast 30-year design life of heavy-duty workshop use and shall be available without any limitation in day-to-day wheel re-profiling of the rolling stock without any vibrations during operation.

6.4.2 Equipment that requires electricity supply shall be compatible with the supply voltage of 415V, 50Hz,  $\pm 10\%$ , surge protection, low voltage protection to be included whenever necessary, 3-phase neutral. Any regulation or protection required shall be in the scope and the responsibility of the Contractor.

6.4.3 Equipment shall incorporate means of adjustment in order to allow for building movement and concrete beam deflections.

6.4.4 The Wheel Lathe shall be of robust construction capable of withstanding severe duty during its design life.


6.4.5 The Wheel Lathe shall be built in rigid dual column construction with both columns connected by rigid cross rail.

6.4.6 In case the bidders prefer to offer any other better construction method, it will have to be a proven technology which will have to demonstrate with documents and test report to the satisfaction of the technical offer.

6.4.7 The Contractor shall certify that the steel structure and metal component used in the plant / machine will last for 30 years without any corrosion duly supported by quality test certificate during the design of the machine.

6.4.8 The Wheel Lathe shall be equipped with four driving rollers, each capable of individual vertical movement to effectively take care of irregularities of un-machined wheel set.



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6.4.9 The Wheel Lathe shall be equipped with axle box support jack and hold down device both capable of operating through CNC pendant. Similarly, box type hardened and ground guide ways matching with slide ways shall be used for tools slides to ensure durable and vibration free operation.

6.4.10 The Wheel Lathe shall have the provision of manual override in re-profiling to generate the intermittent profile.

6.4.11 The fully automatic CNC under floor Wheel Lathe shall be capable to perform, even without the integration of the shunting electric Shunter.

6.4.12 The Wheel Lathe shall have remote diagnostic feature to enable remote interaction with manufacturer / supplier end for rectification of faults. The Contractor shall provide all the Software and Hardware for remote diagnostic and provide hands on training to BEML / CMRL's staff to enable the same. The Contractor shall be responsible for provision of communication set-up to enable the supplier and the BEML / CMRL to interact remotely with the Wheel Lathe computer for rectification of faults. The Internet connection shall be in scope of equipment Contractor.

6.4.13 The Wheel Lathe shall be designed such a way so that no chips arising from wheel profiling work shall fall out of the machine area and it should get accumulate in the Chip Crusher chamber.

6.4.14 The use of Wheel Lathe may not be restricted to Cars of Metro trains only and may be used for turning / re-profiling wheels of other rail vehicles also like Catenary Maintenance Vehicle, wagons etc. with gross load not more than 64 tons for which detailed parameters can be intimated during design stage if any.

6.4.15 CAD drawings of wheel profiles of the different wheels shall be supplied during the design phase to the Contractor.

6.4.16 The Wheel Lathe shall be capable of re-profiling in situ & also in isolation, simultaneously at both wheels of an uncoupled wheel set, old work hardened and new wheels of all types of rolling stocks without the need of removing any components such as wheel sets, bogie brake gear, axle box covers etc.

6.4.17 The Wheel Lathe shall be so designed to ensure an effective and efficient work sequence. Single operator placed between the columns of the machine shall be able to control all the operation of the machine from the single centralized CNC operator pendant and shall have full and clear view of both the cutting points of both sides of rollers.

6.4.18 Each work phase shall be reliable, durable and safe in operations.

6.4.19 The noise level of the machine during its operation shall not exceed 75 dBA when measured at a distance of one meter from the machine.

6.4.20 The machine shall be capable of independent handling the input voltage fluctuation and harmonics without any additional equipment like Isolation transformer, Voltage stabiliser, active harmonic filter. Refer clause 6.4.2 for supply voltage details.

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6.4.21 The connected load of the unit shall be less than or equal to 90KW.

## 6.5 Operating requirements

6.5.1 The Wheel Lathe's Computerised Numeric Control (CNC) system shall have the capability to store different wheel profiles.

6.5.2 Not Used.

6.5.3 The Wheel Lathe shall be capable of machining the inside faces of the wheels in continuation of the profile turning of the wheel tread. In addition, it shall also be capable of re-profiling wheel sets removed from the rolling stock by means of suitable holding down devices.

6.5.4 It should be possible to control cut manually so as to achieve some intermediate profile. MMI (Man–Machine Interface) / HMI (Human Machine Interface) should enable to determine the profile with cuts of different depths.

6.5.5 The Wheel Lathe shall be able to calculate the required depth of cut after the measuring the wheels parameter of a given axle.

6.5.6 The Wheel Lathe shall have the intermittent profiles of variable flange thicknesses of different profiles with proper operational manuals for different profile cutting.

6.5.7 Different vehicles of different weights / axle load (within maximum specified) may have to be reprofiled. The Wheel Lathe should either automatically set different relevant parameters or the Contractor shall furnish detailed procedure for such adjustments and impart training to BEML / CMRL's staff to do such adjustments.

## 6.6 Wheel Lathe Machining Capacity

6.6.1 The Wheel Lathe shall have the capacity to re-profile the four (4) wheel sets of a car in less than four (4) hours, excluding the time for setting up, from a fully worn profile to a completely new profile, considering removal of maximum of 8 mm (in 2 rough cuts) material radially (diameter reduction up to 16 mm) from the wheels. The total time of a single complete cycle required for a wheel set with normal worn wheels in one cut and heavy worn wheels in 2 (two) cuts shall be optimized for efficient operation. Details of calculation of cycle time in order to complete the same within the target time shall be described and same shall be demonstrated by the Contractor at his premises as part of the FAT and at site during the commissioning. The wheel set for demonstration of the machining capabilities shall be arranged by the Contractor.

6.6.2 Not Used.

6.6.3 The Wheel Lathe should be designed for

- i. Cutting Speed (infinitely variable) - 10 to 120 m/min
- ii. Feed (infinitely variable) - 0.1 to 5.0 mm/rev
- iii. Depth of cut(single) - Not less than 4mm (radially)

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#### 6.6.4 Wheel Lathe Measurement Capacity

After wheel machining, the difference between the profile obtained and the theoretical profile should not exceed + 0.1mm on the wheel tread and the active side of the flange. After machining of a wheel, comparison will be made with the calibration wheel supplied along with the machine and the deviation permitted shall be of +/- 0.1mm maximum for all dimensional parameters.

#### 6.6.5 Wheel Profile Measurement Capability

The facility shall be available for pre-loading the reference profiles, comparing the measured data with reference profiles, displaying the comparison, and recording the results.

#### 6.7 Machine control

6.7.1 Operation of the Wheel Lathe and related equipment shall be by computerised numerical control (CNC).

6.7.2 All functions of the Wheel Lathe shall be controlled from a single centralised ergonomically designed control panel through both soft keys and push buttons. The control panel / operator pendant shall allow a full and clear view of the cutting points and the drive rollers to the operator. The control panel shall be pendant type and shall not be floor mounted. The CNC controller shall be of the latest series from M/s Siemens or equivalent. Details of CNC controller shall be described in offer.

6.7.3 Main functions of the CNC software shall be

- i. Interface with the operator.
- ii. Command of Wheel Lathe and accessories.
- iii. Control on the safety device.
- iv. Data storage for profile and history of profiled wheel sets.
- v. Profiling cycle.
- vi. Auto diagnosis of Wheel Lathe and accessories.
- vii. Printing and exporting of profile reports.
- viii. Data exchange with wheel sets management database.

#### 6.8 Principle of the Wheel Lathe operation cycle

6.8.1 The rolling stock vehicle shall be driven inside and moved out of the Wheel Lathe building by means of a remote-controlled Battery-Operated Shunter. On Operator's command through remote controller from the pit, the Shunter shall position the wheel set for re-profiling on the Wheel Lathe running on their tread on retractable rails within the tolerance of  $\pm 25$  cm. The operator pendant shall allow a full and clear view of both the cutting points and both side drive roller to the operator.

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6.8.2 The pair of mobile rails with automatic translation shall ensure the continuity of the rail track over the Wheel Lathe for positioning of the wheel sets. Thereafter the load of wheel sets shall be taken over on to a pair of friction rollers. Hydraulic jacks shall be interlocked with the retraction of mobile rails.

6.8.3 Profiled friction rollers shall then drive the train wheels on the Wheel Lathe. The rollers shall be equipped with anti-slip system. The wheel sets shall be kept in position laterally by a pair of lateral guide rollers and shall be vertically retractable.

6.8.4 The axle box supports shall be commanded by the CNC and shall be integrated in the operation cycle of the Wheel lathe. These shall be in locked position during the machining processes to keep the axle boxes steady, even in case of power failure.

6.8.5 Axle box hold down device shall allow increasing the pressure between the driving rollers and the wheel sets to increase the torque during the reprofiling. The CNC shall calculate the hold down force required according to the wheel set load.

6.8.6 Before the actual profiling cycle, the operator shall perform a pre-measurement of all wheel sets. After calculation of wheel set dimensions and of acceptable tolerances, the Wheel Lathe shall propose an economical depth of cut for re-profiling wheel sets to the operator.

6.8.7 The Wheel Lathe shall be operated for profiling via a CNC control panel so that the operator shall have continuous access to all its functions for the safety and efficiency. During re-profiling, the driving roller arms shall be made independent by CNC to compensate the wheel tread wear and defects, e.g. wheels with heavy wear, normal wear and others like profiling flat tread, brake, only flange, tread with or without the flange.

6.8.8 Measuring shall be done after completion of machining. The whole parameters defining the wheel set geometry shall be measured. The new dimensions of the profiled wheels shall be displayed on the CNC control panel.

6.8.9 The CNC shall compute and deliver a complete profiling report, which shall be printed by an industrial printer.

6.8.10 All the data concerning to re-profiling cycle shall be stored in the hard drive of the PC of CNC and thus shall be protected against any electrical shut down.

6.8.11 The profiling report stored in the PC hard drive shall be able to be exported to an industrial laptop via USB port or better. The dedicated software for the data downloading shall be provided by the supplier along with the Industrial Laptop.

## 6.9 Description of measurement cycles

6.9.1 Wheel profile measurements, including measurement of wheel diameter, shall be undertaken as follows: -

6.9.2 Each tool post of Wheel Lathe shall be equipped with suitable contact type electronic measuring device (retractable type) of proven design. Contact type scanning of wheel profile of worn wheel from the flange top to outer edge shall be determined for optimum cutting depth

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and electronic measurement of wheel set's circumference shall be determined by the CNC system in order to determine the actual diameter.

6.9.3 The Wheel Lathe shall be able to measure the parameters like flange height, flange thickness, wheel back-to-back distance, tread diameter, root wear, flange wear, tread wear, QR (the distance, in millimetres, measured parallel to the axis of the axle, between points on the wheel flange 10 mm above the tread datum position and 2 mm below the tip of the flange) etc.

## 6.10 Description of machining cycle

6.10.1 Wheel machining: Following should be achieved.

i. The Wheel lathe first measures the profile of wheel set to be machined. Rail wheel contact causes different types of wear on the wheel tread and on the active sides of the flanges. Certain limits are prescribed for the allowed variation from one wheelset to another in a bogie and from one bogie to another and from one car of train to another. The Contractor shall interface with Rolling Stock Contractor for these limits.

ii. The Wheel Lathe shall measure the actual profile of worn wheels and CNC control system determines the new optimum wheel set diameter by means of measured data. This nominal machining diameter is indicated at the operator control console, and it can be accepted and rejected by operator. The machine shall compare the measured actual profile with the nominal machining diameter and determine the optimum cutting depth and automatically perform preliminarily and finished cuttings. The alteration by operator shall be allowed. The profile shall be user programmable. Machine shall be capable of machining newly manufactured un-mounted wheel sets using centres and hold down device.

iii. During wheel machining, tool damaging or sudden cycle stopping actuated by the machine station shall take place with retraction of tool. This provision shall make it possible to replace tools, etc. Automatic tool retraction and backup power to HMI in case of power failure shall be provided by the Contractor. The scheme employed for this shall be explained during design stage and shall be a machine design feature.

## 6.11 Screen page

6.11.1 The CNC display shall be operator friendly and the screen page shall display the pre- and post-machining values to the operator simultaneously.

6.11.2 Following Display Principle may be adopted (OP - given by the operator & NC - given by the numeric control system)

Train No	: OP
Vehicle No	: OP
Wheel No	: OP
Type of vehicle	: OP
Date and time	: NC, operator correction possible
Axle position	: OP

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Faults	: NC
Remainder of wheel diameter	: NC
Wheel position (left or right)	: OP / NC
Wheel diameter	: NC
Height, thickness, QR dimensions	: NC of flanges, wheel wrap
Wheel profile	: NC

6.11.3 Depending on the accepted tolerances for the wheels of a given vehicle, it is possible that the wheels already machined would be out of tolerance, thus requiring re-machining. To avoid this, the Wheel Lathe will have capability to measure four wheels of a same bogie in a car and decide the optimum turning requirement.

6.11.4 The software shall store the new measurements of the wheelset already machined and replace the previous measurements with post machining. Historical records of re-profiling of wheel set should be stored.

#### 6.12 Machine Configuration (Mechanical part)

6.12.1 The machining technique should normally restore the worn wheel profile to true profile conditions. However, it should be possible to restrict the cuts depth without achieving the true profile. The profile obtained shall not depend on the wheel wear status and shall be in accordance with the specified tolerances to be given by the Rolling Stock Contractor.

6.12.2 The additional mechanical installation shall make it possible to simultaneously re-profile two wheels of a given axle, dress the inner sides of the wheels.

6.12.3 For all these machining works, no dismantling will be required on wheel, axle box and the wheel

#### 6.13 Setting up the Axle:

6.13.1 The operational sequence shall be fully described in the offer, considering the full safety of the system, which should be as per the following-

6.13.2 The Rolling Stock shall be hauled inside the Wheel Lathe shed by means of a Battery-operated Shunter interlocked with Wheel Lathe. The operator commanding remotely from the Wheel Lathe pit at the machine control panel shall be able to position the wheel set for re profiling within a tolerance of +25 mm and to achieve necessary interface with the supplier of Battery-operated Shunter shall be done.

6.13.3 The wheels positioned for re-profiling shall run on their wheel tread on mobile retractable rails (hydraulically actuated and operation interlocked with the vehicle movement from the machine control panel).

6.13.4 The axle boxes shall be supported by lifting with hydraulic actuated jack.

6.13.5 The wheel set shall be positioned and centred by synchronised lifting of the driving

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rollers.

6.13.6 The mobile rails shall be retracted to home position.

6.13.7 The hold down arms shall hold the axle boxes in position by applying force from top.

6.13.8 The wheel sets shall be kept in position laterally by a pair of lateral guide roller or suitable arrangement.

#### **6.14 Axle centring - During centre-less profile turning.**

6.14.1 Axle centring during centre-less re-profiling shall be achieved by means of the drive rollers and lateral guide rollers locating the axle in the vertical and horizontal planes. Only one train wheel setting-up operation shall be required for a particular type of vehicle.

6.14.2 Concentricity of the profile shall be provided by the vertical movements of the drive rollers mounted on the slide blocks by suitable arrangement, which shall be described in detail along with the offer.

6.14.3 Irregularities in the wheel treads may be flats, thermal cracks, splits or out of round areas. All these faults should be corrected in a single machining pass with minimum tool wear / damage.

6.14.4 During machining, the axis of the axle shall not move, in any case whatsoever, in the track direction. The Contractor shall give full details on the method used to impede any longitudinal movement.

#### **6.15 Axle centring - Between-centre turning**

6.15.1 The Wheel Lathe shall be designed for mounting of bare axles between rotating centres. The rotating centre shall be easy to remove and shall be replaceable with hold down arm from their support and shall be fitted with handling rings. The revolving centres (weight <25 kgs) shall be fitted by replacing the hold down device. Centre points shall be machined to 60 or 90 degrees.

6.15.2 The supports of the rotating centres shall be located in the axis of the lathe. Centres shall be adjustable upwards and side wards to enable machining of wheel set of different types of axles.

6.15.3 The supports and the rotating centres shall be designed to handle the vertical turning reactions and the loads from the drive rollers applied to the wheels.

#### **6.16 Axial support of the axle - Centre-less profile turning**

6.16.1 A side-securing device for axles shall be designed and proposed by the Contractor for facing turning. In particular, this device should:

- i. Lift the wheel set from retractable rails.
- ii. Maintain the axle in the axis of the lathe during turning,



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- iii. Enable movement of the axle to position it in the axis of the lathe,
- iv. Centre the axles, no matter what might be the spacing between the inner sides, wheels.
- v. Transfer of torque from drive roller onto the wheel set during machining.

6.16.2 The loads applied to the inner sides of the wheels shall not cause deformation of the wheel.

6.16.3 This device shall be designed to leave operators with very good visibility and to make it possible monitor tools during wheel machining.

6.16.4 Axial support of the axle - Between-centre turning.

6.16.5 The axle shall be held sideways by rotating centres for between-centre turning.

#### 6.17 Axle drive

6.17.1 The Wheel Lathe shall rotate the wheels by means of a pair of rollers on the wheel tread. It shall be equipped with four driving rollers. AC Servomotor with variable speed drive shall be used for roller drive. Details shall be furnished during the design stage. This shall be integrated with the CNC system.

6.17.2 Drive to the wheels shall be from a set of two drive rollers on either side. The design shall be equipped preferably with common drive for each side paired Rollers or Single drive for all 4 rollers. Drive rollers shall be of suitably heat-treated alloy steel. Distance between the drive rollers shall be designed to accommodate all wheel sets.

6.17.3 Considering the maximum torque required for wheel re-profiling, especially at hard points on the wheel tread at the tool, it is necessary that all provisions be taken so that the drive roller-wheel adherence remains effective in all configurations.

6.17.4 The axle drive shall be monitored to avoid any slippage during turning. Any slippage conditions shall warn the operator by displaying an error message, stop the feed or retract the tools depending on the extent of the slippage.

#### 6.18 Tooling

6.18.1 The Wheel Lathe shall be capable of turning wheel profiles with throw away type carbide inserts with built in Chip Crusher. The chips that are yielded from the machining process shall not exceed an average 300 mm in length before entering the Chip Crusher. The total number and type of inserts required for each tool holder shall be indicated. The tools and tool holders shall preferably be available in India. Sandvik / Widia or better make tooling shall be accepted.

6.18.2 The profiling tool saddle shall be of standard reversible tools, designed to provide short broken chips. The saddles horizontal & vertical motions shall be obtained with ball screws controlled by AC motor and transducer. In case of power failure CNC shall command the retraction of the tool holder.

6.18.3 Tool-holders shall be easy to remove and their positioning on the toolholder carriages shall be very precise to provide accurate machining of wheels.



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6.18.4 Interchanging tool-holders shall not require readjustment of the Wheel Lathe

6.18.5 Cutting tools shall be mounted vertically between the drive rollers.

6.18.6 Special care shall be taken in the design and construction of the tool holder carriages to facilitate any disassembly required for maintenance purposes or for replacement of components, e.g., ball screw, screw block, etc.

#### 6.19 Wheel Measurement Devices

6.19.1 The Wheel Lathe shall be fitted with suitable retractable type of wheel measurement devices of proven design to make the wheel measurements. The devices shall be so designed to be protected from dust and chips. The Contractor shall indicate the selected types of protection systems. The Wheel Measurement Devices should be able to measure

- i. Wheel Diameter: The Contractor shall spell out detailed methodology in the offer.
- ii. Wheel Profile: Measurement facility shall be provided for measuring wheel profile before and after the machining. The facility shall be capable of pre-loading of reference profiles, comparing the measured data with reference profiles, displaying the comparison, and recording the results. Standard Test piece shall be used for calibration.

6.19.2 A spare wheel set shall be used for the calibration of the Wheel Lathe numeric controls. The Wheel Lathe shall be capable to recalibrate the 2-axis using calibration wheel set. The wheel set shall be pre-calibrated and certified from a certified test house. A suitable stand along with a cover shall be provided for keeping the wheel set when not in use. Calibration schedule, procedure and tools requirement shall be supplied.

#### 6.20 Result editing

6.20.1 After the machining or measurement operations have been performed on a vehicle (from 1 to 4 axles), the pre- and post-machining measurement results shall be printed on an A-4 size sheet of paper in table form of parameters, like flange height, flange thickness, wheel back-to-back distance, tread diameter, root wear, flange wear, tread wear etc of newly profiled wheel. An Industrial Laser printer compatible to CNC Wheel Lathe shall be supplied for the same.

6.20.2 The profiling reports that are stored in the Wheel Lathe hard drive shall be possible to be exported to an Industrial laptop / microcomputer via interface software with hardware like USB port or better.

#### 6.21 Machine Performance Requirements

6.21.1 Not Used.

6.21.2 Maximum tolerances are as follows

- i. Difference between the diameters of the wheels of a given axle : 0.2 mm

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ii. Difference between the diameters of the wheels of a given bogie : 0.3 mm

iii. Out of round : 0.2 mm

iv. Surface finish : 25  $\mu$ m (Ra)

6.21.3 Suitable templates shall be provided to check each profile after machining.

## 6.22 Chip Disposal System

### 6.22.1 Chip Crusher

i. An integrated Chip Crusher of proven design shall be provided to crush the chips produced from turning the wheels to small chips with an average length of 300 mm.

ii. The Chip Crusher shall be capable of handling a volume of chips produced under any machining condition.

iii. The Chip Crusher shall be a box type steel casing with number of high-grade special steel blades running at slow speed. It shall be mounted under the Wheel Lathe. The construction of a linking duct between this hopper and the crusher shall form part of the supply.

iv. The structure of the crusher shall have strength for long lasting operation without denting and deformation. The plate thickness shall not be less than 3 mm.

v. The crusher shall incorporate with safety measures to handle the blocking situation of chips at the crusher or the Chip Conveyor.

vi. The electrical switchboard and other accessories, which require to be attended by an operator, shall be located at safe places for protection of human injuries.

vii. An electrical overload load trip shall be provided to save the crusher against accidental overload due to some foreign material. Detailed design of Chip Crusher shall be described during the design stage.

### 6.22.2 Chip Conveyor

i. A Chip Conveyor shall be provided in the Wheel Lathe shed for chip removal. The chips shall be conveyed and discharged to a skip located inside the Wheel Lathe shed. It needs to be designed as per the site availability.

ii. A wheeled chip trolley (2 nos) with unloading by tilting mechanism shall be provided.

iii. An electrical Contactor shall be provided in order to slave its operation to that of the lathe machining cycle. Nonetheless, manual control shall be allowed, subject to approval by CMRL.

iv. The flow capacity of chip conveyer shall not be less than 20 Kg/hr or weight of chip cutting per hour.

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### 6.23 Rails

6.23.1 A track rail running from one side of the pit Wheel Lathe shed to the other end except on the pit shall be provided by the Interfacing Track Contractor and used to enter and exit trains.

6.23.2 All sliding rails and fixed rails, which are an integral part of the Wheel Lathe, shall be supplied and laid by the Contractor.

6.23.3 Not Used.

### 6.24 Holding Down devices

6.24.1 Holding down devices shall be applied to the external axle box cases at locations designed for this purpose in order to make re-profiling of un-mounted wheel sets as well as mounted wheel sets and the lightest vehicle wheels possible.

6.24.2 All types of adaptation tooling / claws shall be designed and made available for various types of axle boxes on multiple Metro cars, locomotives, wagons, and any other rail vehicles as applicable. The required data for design shall be obtained from Interface Contractors. The travel distances of hold down device shall make it possible to apply the loads on the various types of axles involved.

6.24.3 The complete assembly of the Wheel Lathe shall be clear of the Kinematic profile of the train car. This will need an interface with the Rolling Stock Contractor.

### 6.25 Hydraulic Installation (Hydraulic Unit)

6.25.1 The Hydraulic power unit shall be inbuilt and integrated into the Wheel Lathe.

6.25.2 The unit shall be fitted with temperature and level control systems. Filters shall be compatible with distribution and regulation apparatus and pumps (filtering less than 12 microns). A pan shall be provided to recover fluid in the event of leakage.

6.25.3 The hydraulic system shall be equipped with protection devices for Overheating, Overpressure, Low oil level, Surge protection (if required)

6.25.4 Preferably, hydraulic pumps shall operate during controlled movements. Accumulators shall compensate for component movement during machining and any possible leaks. Other solutions may be suggested.

6.25.5 Commissioning of the hydraulic installation shall be the responsibility of the Contractor who, consequently, shall provide the hydraulic fluid recommended by the manufacturer of the hydraulic unit, including filling, draining after operation of the number of hours scheduled by the manufacturer of the hydraulic unit and further maintaining the same as per scope.

6.25.6 The Contractor shall perform all operations recommended by the manufacturer, e.g., replacement of filters, cleaning of the hydraulic unit tank, etc.

6.25.7 The complete hydraulic power pack shall be from proven suppliers.

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6.25.8 Filter clogging alarms shall be provided to warn the operator.

6.25.9 Hydraulic unit tank filling shall be via a port protected with a filter (12 microns).

6.25.10 The oil shall be readily available in India.

6.26 Chilling unit shall not be used for Hydraulic drive system or any other drive.

#### **6.27 Hydraulic gear**

6.27.1 Hydraulic gear shall be homogeneous throughout the entire installation.

6.27.2 Not Used.

6.27.3 Piping shall be integrated within the Wheel Lathe enclosure. It should be concealed and suitably protected.

6.27.4 Each hydraulic circuit shall be fitted with an easy to access test plug.

6.27.5 All supplies, assembly of pipes and connection components concerning the hydraulic installation are the responsibility of the Contractor.

6.27.6 All supplies shall be physically identified (riveted labels or numbers stamped on components). The same identification shall be indicated on electrical and hydraulic diagrams and in supply nomenclatures.

#### **6.28 Jacks**

6.28.1 All hydraulic and pneumatic jack pistons shall be protected from dust and chips. Scrappers shall stop foreign particles from entering into the jack barrels. Jacks shall be easy to access for maintenance operations.

6.28.2 Jack links by rigid piping or hoses shall be of easy access for all maintenance operations.

#### **6.29 Pressure sensors**

6.29.1 Pressure sensors shall be installed on any hydraulic circuit requiring permanent monitoring for good Wheel Lathe operation.

#### **6.30 Lubrication**

6.30.1 The Wheel Lathe shall be provided with an automatic lubrication system for lubrication of sliding / rolling surfaces. The system shall be complete including filters, level indicator etc.

6.30.2 The Wheel Lathe guide ways shall be lubricated for life and shall require no wet lubrication from the system.

6.30.3 Arrangement shall be provided to indicate failure of the lubricating system and displaying the adequate information on control panel for the operator and protecting the Wheel Lathe. If it endangers the safety of Wheel Lathe, the operation shall stop.

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6.30.4 The lubrication system shall be explained during the design stage with a lubrication diagram. Following should also be mentioned:

- i. Periodicity of cleaning / replacement of filters
- ii. Periodicity of replenishing lubricating oil in the sump
- iii. Any other necessary information

### 6.31 Numeric control

6.31.1 The numeric control shall be of reputed make and built to satisfy the technical specifications. The workstation screen is proposed to be 15" LCD/LED or better. The Contractor shall give the standard scheme available with their design of Wheel Lathe.

6.31.2 Each tool-holder carriage shall be independent during the turning operations.

6.31.3 The numeric control shall be designed for maximum reliability and easy maintenance.

6.31.4 The control shall be protected from the effects of overheating by operator alarm and by power cut off or better safety.

6.31.5 To facilitate numeric control use and maintenance, the following types of diagnostics and test circuitry shall be provided

- i. System integrity diagnostics (verification of the software, Wheel Lathe adjustment data, tool corrections, part program, etc.) at equipment power-up.
- ii. Hardware diagnostics (cards fitted, normal operation of critical cards, power supply current and voltage).
- iii. Not Used.
- iv. Test circuits (display of machine position and tracking error, display of memory contents, etc).
- v. Access to the various BUSES for connection of an analyser.

6.31.6 Emergency thresholds and limits shall be provided to avoid unwanted feeding the tool in the Wheel Lathe and in the wheel to be re-profiled.

6.31.7 The numeric control shall be designed in such a manner that the modification of the profile of a wheel, the replacement of a profile, the modification of a cycle or basic data concerning the definition of profile, can be carried out. Program for modifications should be available.

6.31.8 In guided operator mode

- i. Connectors for the addition of a data input keyboard, an Ethernet connector output (or better) and a laser printer shall also be provided. The software shall be designed to enable the hardware.

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- ii. The operator machine dialogue shall be by means of a keyboard and display control touch in operator panel / pendant.
- iii. Operation running cycles and sequences shall be displayed in real time and in plain English language on screen pages. A screen page per operation (setting up of an axle, measurement, machining etc.) shall be provided.
- iv. Interrupts in the sequence shall be reported. Manual sequences shall be guided by means of operator messages.
- v. Parameter input shall be by means of masks intended to guide the operator.

### 6.32 Roller drive motor

6.32.1 The Wheel Lathe shall be equipped with four driving rollers.

6.32.2 The adherence of the wheels drive rollers is provided by the weight of the vehicle and additionally by the axle box holding down devices as required.

6.32.3 The circumferential speed of the drive rollers (cutting speed of the tooling) is proposed to be adjustable from 10 to 120 m/min for wheel machining. Contractor shall propose speeds as per their design to meet the specified output.

6.32.4 AC servomotor of proven design with variable speed drive shall be used for roller drive. This will be integrated with CNC system.

6.32.5 Axis motors and axis coders shall be designed to suit the required machining precision.

### 6.33 Not Used


### 6.34 Control panels

6.34.1 Panels shall be provided for control and monitoring of the Wheel Lathe and shall be sized to take environmental conditions into account. The panel shall be dust and water splash tight and the ambient temperature outside may go up to 50 deg C. The IP level for the control panel shall be at least IP54.

6.34.2 All panels shall be designed to accommodate ambient temperature and humidity conditions, by having heating cum air conditioning systems of reputed international makes only.

6.34.3 The design shall suitably consider all aspects, which shall be discussed and tested during design stages. In addition, the panels shall have the following

- i. It shall have an earthing terminal.
- ii. It shall comply with the regulations in force.
- iii. The front panel shall be fitted with three indicating lights in three different colours (Red, Yellow, Blue) for the three incoming phases of power supply, lit when power on.

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- iv. All the control panels should include special button for testing mode.
- v. A three-pole isolating switch pad lockable in the open position will supply power to the installation
- vi. Doors will have removable keys and compartments for storage of electrical diagrams.
- vii. Material for cabinet shall be metallic anticorrosion and painted / powder coated in colour to be decided with CMRL.
- viii. Wire marking shall be engraved type. Alternative systems may be proposed if better.
- ix. The Contractor shall provide galvanic insulation between the different components. The electronic blocks and boards must be quickly replaceable without requiring dismantling of any other neither component nor removal of a cable or set of cables.
- x. The sub-assemblies performing the same function shall be strictly identical and interchangeable.
- xi. The functions shall be distributed on boards connected to the cabling by connectors, this distribution shall be designed so as to limit the troubleshooting time (each function clearly delimited per board).


#### **6.35 Electrical Cabinet:**

6.35.1 The cabinet shall comprise of

- i. A main three-pole isolating switch which can be padlocked in the open position, fitted each with high rupturing capacity (HRC) fuses and single-phasing preventer in a Fuse Switch Unit.
- ii. A main circuit breaker.
- iii. An isolating switch for each component.
- iv. The contactors and relays used for operation of the installation.
- v. Magnetic / thermal protection specific to each movement.
- vi. A programmable logic controller (type and brand to be specified), A light shall be interlocked with cabinet door opening.
- vii. The dimensions of the cabinet shall be designed for future expansion by about 20%.
- viii. All the electrical equipment specifications are to be submitted for approval, before assembling.

#### **6.36 Electrical switchboards**

6.36.1 All control and regulation electronic and electrical devices, etc. shall be mounted in dust-proof switchboards of at least IP-54 protected and shall include an earthing terminal. Switchboards shall be designed so that inspection, repair and maintenance shall be easy after doors have been

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opened.

6.36.2 Switchboards shall be in accordance with the regulations in force and on the front fitted with power on indicators.

6.36.3 A general three-pole isolating switch, latch-able in open position, supplies the installation.

6.36.4 The inside of the switchboards shall be illuminated by means of LED tubes controlled by door opening. Doors shall be locked with removable keys. Locations shall be provided for storage of electrical diagrams. All glands to the panel shall be of double compression type.

6.36.5 An industrial type power socket with MCB shall be installed separately from the power source.

### 6.37 Switchboard equipment

6.37.1 Electronic cards or blocks must be designed for quick and easy replacement without requiring disassembly of other apparatus or gear, or the movement of a cable or bundle of cables.

6.37.2 Sub-assemblies performing the same function must be fully interchangeable and perfectly identical.

6.37.3 Machine electronics must be designed to facilitate repair and troubleshooting.

6.37.4 The equipment shall normally be able to operate at the ambient temperature of the workshop.

6.37.5 In particular, with regard to the technical cards

- i. Functions shall be distributed on cards connected to cabling with connectors.
- ii. Distribution shall be studied to limit the troubleshooting and repair time (functions effectively limited per card).
- iii. During card replacement, adjustments must be limited to those which are strictly necessary.
- iv. Technologies used by the various Subcontractors must be homogeneous (same card format, same connectors, etc).
- v. All the Card Cabinets shall be labelled using stamped identification.

### 6.38 Machine wiring

6.38.1 All outside cables shall be protected from any damage, which could be caused by chips, oil and grease. Protection sheaths shall be mounted on the Wheel Lathe so as not to hinder or retain machining chips. Connections made on protection sheaths and components controlled or junction boxes shall be of a mechanical type and removable, e.g., with screws and nuts.

6.38.2 The maximum amount of machine wiring shall be laid inside the machine frame.



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6.38.3 Machine, panel and electrical switchboard wiring shall be laid inside the machine frame.

6.38.4 Limit switches shall be installed in areas where chips do not reach. Protection systems shall be installed in all areas where there are hazards.

6.38.5 All wires and cables shall be terminated using relevant lugs with ferrules for cable. Wire identification.

6.38.6 All cables, apparatus, gear and terminal strips shall be identified with relation to each connection. The same identification system shall be marked on the hydraulic and electrical diagrams.

6.38.7 Cabling and connection of the installation are the responsibility of the Contractor.

6.38.8 Machine Earthing: The Wheel Lathe equipment shall be earthed as per relevant IS standards and shall have loop earthing.

#### **6.39 Data processing Equipment:**

6.39.1 The data processing equipment of the Wheel Lathe shall have the following minimum Configuration

- i. The Wheel Lathe CNC shall be PC based and shall offer all PC interface like LAN / WAN / Wi-Fi connectivity and shall have ample storage capacity to store wheel profiling data. It shall be compatible with IBM standard software or better, suitable for remote diagnostics.
- ii. 102-key Keyboard, 15" LED, Windows OS, latest version. Industrial grade Printer, or equivalent.
- iii. Provision of Uninterrupted Power Supply (UPS) for PC system and Printer with 1 hour back up time.

6.39.2 The Contractor will provide the programming consoles, application software, which should be compatible with and seen on windows platform and should be upwardly compatible. It shall be possible by BEML / CMRL to modify specific parameter through application software.

#### **6.40 Maintenance and upkeep conditions**

6.40.1 All component parts of the Wheel Lathe must be appropriately protected to stop ingestion of metal dust and chips. All covers, slide caps, hoods and neighbouring boxes of tool holders shall be made sufficiently hermetic to stop metal dust from entering into these areas. All covers, and hoods shall be easy to remove.

6.40.2 The Wheel Lathe and its accessories (hydraulic unit, electrical switchboards, numeric control system cabinets, etc.) shall be designed to facilitate maintenance operations.

6.40.3 All anomalies shall be reported to the operator by means of messages on the numeric control system screen.

6.40.4 A centralised and automatic lubrication device, with pressure and flow control for each lubrication point and display of faults on the numeric control system screen, shall lubricate the

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maximum number of moving components. Non-centralised lubrication points shall be located so that they do not call for the removal of any components to obtain access.

#### **6.41 Interlocking with Battery Operated Shunter**

6.41.1 The Wheel Lathe shall have the provision of wireless interlocking with Battery Operated Shunter for the movement of the Rolling Stock during the reprofiling of wheel sets. The Wheel Lathe supplier shall co-ordinate with the Shunter supplier during the detailed interface.

#### **6.42 Dust / Fume exhaust system**

6.42.1 The dust and fumes emitted during the machining of wheels are needed to be extracted and disposed through exhaust system. The design of the exhaust system shall be Environment friendly and shall be submitted for approval to BEML / CMRL.

#### **6.43 Protection and Safety (Machine Safety)**

##### **6.43.1 Machine safety**

- i. The sliding rails shall be locked in the extended and retracted positions.
- ii. A device shall be provided to impede any accidents during sliding rail operation if an obstacle is encountered.
- iii. The following conditions must be satisfied for vehicle hauling
- iv. Continuity of the track provided by the sliding rails.
- v. Mobile parts of the machine, viz. roller-holder sliding block, tool-holder sliding block, read head, etc., in retracted position.
- vi. Safety devices shall be provided to impede any damage to the machine and serious personnel injury in the event of false manoeuvres.
- vii. Interlocking of Battery Shunter with lathe machine shall ensure that
- viii. The shunting will not take place when the lathe is working on Rolling Stock.
- ix. When the shunting is being done using the Shunter, the Wheel Lathe shall not work, and its rails shall be in closed position.

6.43.2 Personnel safety: In relation to operator's protection, the machine shall meet the following Conditions

- i. The machining area and workstation shall be appropriately illuminated.
- ii. Protection against movement of vehicle when retracting rails are not locked.
- iii. Automatic tool retraction device to withdraw the tool in the event of sudden power failure.
- iv. Arrangement to ensure adequate support to the vehicle in the event of sudden power failure

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or failure of the hydraulic system. In these eventualities, the vehicles shall continue to be securely supported.

v. Protection against faulty sequence of operation shall be provided.

6.43.3 Emergency Stop pushbuttons (key lockable) shall be installed on following locations

- i. On the control panel
- ii. At the workplace
- iii. At the chip disposal system

6.43.4 Protection against chips, the machine shall have the system of Swarf- Protection Guards against the direct influence of chip from the cutting area.

6.43.5 Proper Work Ergonomics should be provided. Operators stand should be located in a way for allowing optimum use of area of pit type foundation.

6.43.6 Fire Protection should be provided on the basic body of the machine. The design parameter of electrical installation shall be in safe range to protect from fire.

6.43.7 Mechanical Protection to be provided against dangerous state of break in track continuity over the machine (displaced retractable rails of the machine).

6.43.8 The Contractor shall provide details of the complete scheme being proposed.

#### 6.44 Standards:

6.44.1 Work related to the design and manufacturing of the proposed machine shall comply with relevant international standard or equivalent Indian standards, Codes of Practice, and the latest statutory requirements of India as applicable.

Note : The Contractor shall submit technical evidence for the compliance against UFWL TS clause no: 6.4.20, 6.6.1, 6.6.3, 6.6.4, 6.6.5, 6.8.3, 6.17.2, 6.21.2, 6.25.1, 6.26, & 6.27.3 during the design stage.

## 7. Interface Management

### 7.1 Introduction

7.1.1 In conjunction with other associated Contractors the Contractor shall be responsible for all interface matters related to the design, manufacture, supply, testing & commissioning of the respective machine(s) under their scope of supply.

7.1.2 Major Interfacing Contractors for machinery and plant Contractor are (wherever applicable):

- a) Depot Civil Contractors (DC)
- b) Depot Electrical & Mechanical Contractor (E&M/MEP)

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- c) Rolling Stock Contractor(s) (RS)
- d) Track Contractor (TRW)
- e) Signalling & Train control Contractor (STC)
- f) Overhead Electrical Contractor (OHE)
- g) Asset Maintenance Management System Contractor (*Refer Part 2 Section VI B Chapter 6C*)
- h) Telecom & Radio (RAD) Contractor


7.1.3 If any part of the execution of the Works for the Chennai Phase-II programme should require the Contractor to undertake coordinated interface works and/or exchange information with any other party or Contractor; then the Depot Machinery and Plant Contractor shall provide those services as part of their obligation of this Contract at no addition cost to BEML / CMRL. The appointed Interface Manager shall facilitate coordination of the same.

7.1.4 The Contractor shall apply best endeavours to resolve all interfaces applicable to the Contract and shall be proactive in seeking out interface issues and to identify their optimal solution.

7.1.5 It is foreseen that multiple rolling stock fleets (up to a maximum of three (3)) shall serve the Chennai Metro Phase-II network and shall be maintained at Madhavaram Depot. The Depot M&P Contractor is therefore required to coordinate the interface requirements of all fleets during design, manufacturing, testing & commissioning to ensure that all machines are cross-compatible with all fleet types (except for cases where it is explicitly stated otherwise in the machine specification).

#### 7.1.6 Interface Responsibilities

- i. The responsibility for specification and provision of the requirements for the works that interface with Designated Contractors' equipment is tabulated in corresponding section of the document.
- ii. The requirements specified herein are by no means exhaustive and it remains the Contractors responsibilities to develop and execute jointly an Interface Plan after the commencement of the works and throughout the execution of works, to ensure that:
  - a) All interfacing issues between the two Contracts are satisfactorily resolved.
  - b) Supply, installation and testing of equipment and software are fully co-ordinated.
  - c) That all equipment supplied under the respective Contracts are fully compatible with each other, whilst meeting the requirements of the respective Specifications.
  - d) All the construction tolerances at the point of interface shall meet the requirements of the respective specifications relating to the interface points.
  - e) Interfacing Contractors shall mutually respect each other's project timelines with respect to the interface requirements.
  - f) Interfacing Contractors shall finalize their respective interface equipment only after clear agreement on interface requirements with the other designated Contractors.
  - g) Interfacing Contractors shall ensure that in any case, no equipment of their system shall be put into production or installation without meeting the interface requirements spelt out in this Chapter and/or in the Technical Specification.
  - h) Test procedures, troubleshooting manuals and any other documentation shall be updated with technical details from each Contractor and shall be submitted to BEML / CMRL.


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#### 7.1.7 Interface Management

- i. All Interfacing Contractors (which are listed under clause 7.1.2) with the exception of the Rolling Stock Contractor shall assume the role of Lead Interface Contractor.
- ii. Where the DM&P Contractor is not the Lead Interface Contractor, the DM&P Contractor's role is defined as a Participating Contractor with respect to interface management.
- iii. The Lead Interface Contractor shall be responsible to initiate, plan, coordinate and produce jointly with the Participating Contractors a list of all the required interfaces, interface design documents and shall produce interface progress reports. The Lead Interface Contractor shall also prepare and issue all interface meeting of minutes within 3 days of the meeting and provide bi-weekly interface progress reports to all the participating Contractors for information.
- iv. Participating Contractors shall collaborate fully with the Lead Interface Contractor in the development and finalization of the interface design, joint production of the interface documents and interface progress reports. Participating Contractors share responsibility of ensuring that the Lead Interface Contractor is able to submit a copy of the all-interface design documents (including the Detailed Interface Design (DID) deliverable) to the Engineer/CMRL for approval.
- v. The costs for all interface design and testing works shall be deemed to be included in the Contract sum of respective contracts regardless of the actual extent of effort required or expended by the Contractor.
- vi. The Contractors shall be fully responsible for the management and control of their respective Subcontractors in relation to all interfacing activities carried out under the Contract.

#### 7.2 Interface Specification: Depot Machinery & Plant (DM&P) Contractor & Rolling Stock (RS) Contractor

Item	Responsibility DM&P Contractor	Responsibility of Each RS Contractor
1. Under floor Wheel Lathe (UFWL)	a. Shall collect the required design related data for Bogie, wheel profile and all relevant information	a. Shall provide the required design related data for Bogie, wheel profile and all relevant information to DE Contractor.
	b. Shall take into account RS specification and detailed parameters for designing machine.	b. Shall furnish to DM&P Contractor, all along the design stage, any update, accurate details to enable him to finalise the machine design.
	c. Shall manufacture the equipment ensuring no infringement of bogie component and shunter underframe component which may cause hindrance during rollover, profiling etc.	c. Shall coordinate with DM&P Contractor to provide and confirm specific details as required.
	d. Shall demonstrate the testing and commissioning as per tender requirement.	d. Shall attend and provide necessary support to DM&P Contractor during Wheel lathe testing and commissioning as necessary.

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2. General	a. DM&P Contractor shall ensure all the interface requirements pertaining to RS Contractor are shared and agreed mutually.	a. RS Contractor shall ensure all the interface requirements pertaining to DM&P Contractor are shared and agreed mutually.
	b. DM&P Contractor shall prepare Detailed Interface document (DID) and shall ensure that it covers Design, Interface Hazard log, Construction, Testing & Commissioning, Test report formats, Maintenance as applicable.	b. RS Contractor shall provide the necessary information and support as requested by DM&P Contractor.

### 7.3 Interface Specification: Depot Machinery & Plant (DM&P) Contractor and Track Works (Tw) Contractor

Item	DM&P Contractor Responsibility	TW Contractor Responsibility
1. Under Floor wheel Lathe (UFWL)	a. DM&P Contractor shall provide drawings of equipment's to TW Contractor.	a. TW Contractor shall provide track geometry details to depot equipment Contractor.
	b. Marking on the track will be given by DM&P Contractor for UFWL Contractor and coordinate with TW Contractor for gauge face matching of running rails with equipment.	b. TW Contractor shall lay the required type of track and coordinate with DM&P Contractor to ensure correct gauge face matching of equipment level with proposed track rail level with alignment of equipment / track. Track cutting as required shall be done by TW Contractor wherever applicable.
2. General	Shall provide the necessary information and support as requested by Track Contractor.	Shall prepare Detailed Interface document (DID) and shall ensure that it covers Design, Interface Hazard log, Construction, Testing & Commissioning, Test report formats, Maintenance as applicable.

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#### 7.4 Interface Specification: Depot Machinery & Plant (DM&P) Contractor and Depot Electrical & Mechanical Contractor (E&M / MEP) Contractor

Item	DM&P Contractor Responsibility	MEP/E&M Contractor Responsibility
1. Under floor Wheel Lathe (UFWL)	a. Shall verify with MEP/E&M Contractor for the existing provision of the electrical power (w.r.t to machine starting and full load current, kW, including lighting, Earthing cable, Routing and location of the power point etc) for UFWL.	a. Shall share the layout drawing and details required by UFWL Contractor. Also provide the provisions for the power input and earthing, cable routing, isolator, circuit breaker, lightning and other electrical requirement by DM&P Contractor. Power incoming cable and earthing upto and with main switch electrical panel inside PWL shed. DM&P Contractor shall extend from this point to wheel lathe.
	b. Shall provide and install the sump pump with flexible pipe for pit water drainage.	b. Shall coordinate and provide the drainage conduit opening in pit which will be connected to depot / workshop drainage channel etc.
2. General	a. Shall ensure all the interface requirements pertaining to MEP/E&M Contractor are shared and agreed mutually.	a. Shall ensure all the interface requirements pertaining to DM&P Contractor are shared and agreed mutually.
	b. Shall provide the necessary information and support as requested by MEP/E&M Contractor	b. Shall prepare Detailed Interface document (DID) and shall ensure that it covers Design, Interface Hazard log, Construction, Testing & Commissioning, Test report formats, Maintenance as applicable.

*Note : It shall be noted that the scope of E&M/MEP is included with Depot civil contract. DM&P Contractor shall coordinate and Interface for all the required aspects as stated above (but not limited to) and other as necessary for the effective execution of project.*

#### 7.5 Interface Specification: Depot Machinery & Plant (DM&P) Contractor And Signalling Train Control (STC) Contractor

Item	DM&P Contractor Responsibility	STC Contractor Responsibility
General	Shall provide the necessary information and support as requested by STC Contractor.	Shall prepare Detailed Interface document (DID) and shall ensure that it covers Design, Interface Hazard log, Construction, Testing & Commissioning, Test report



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		formats, Maintenance as applicable.
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## 7.6 Interface specification: depot machinery & plant (DM&P) contractor and overhead equipment (OHE) contractor

Item	DM&P Contractor Responsibility	OHE Contractor Responsibility
General	Shall provide the necessary information and support as requested by OHE Contractor.	Shall prepare Detailed Interface document (DID) and shall ensure that it covers Design, Interface Hazard log, Construction, Testing & Commissioning, Test report formats, Maintenance as applicable.

## 7.7 Interface Specification: Depot Machinery & Plant (DM&P) Contractor and Telecom & Radio (RAD) Contractor

Note: The DM&P Contractor shall ensure to deemed consider and perform the required interface with Telecom & Radio Contractor as applicable for design, manufacturing, installation, testing commissioning etc of the works.

## 7.8 List of Employer's drawing:

SI No	Drawing No	Drawing Title
1	GFC503-DD-MMC-AR-DW-28001	Madhavaram Depot Site Plan
2	GFC503-DD-MMC-AR-DW-28010	Workshop and Deep cleaning Bay
3	GFC503-DD-MMC-AR-DW-28017	Workshop Bay Ground Floor plan
4	GFC503-DD-MMC-AR-DW-28273	Auto Coach Wash Plant
5	GFC503-DD-MMC-AR-DW-28192	Auto Coach Washing Plant -Control Room Plan
6	GFC503-DD-MMC-AR-DW-28193	Auto Coach Washing Plant- Sections & Elevations
7	GFC503-DD-MMC-AR-DW-28019	Workshop Bay- Sections
8	GFC503-DD-MMC-AR-DW-28021	Depot Store -Ground Floor Plan
9	<b>GFC503-DD-MMC-AR-DW-28031</b>	<b>ETU and PWL Block- Ground Floor Plan</b>
10	<b>GFC503-DD-MMC-AR-DW-28036</b>	<b>ETU and PWL Block- Sections</b>
11	GFC503-DD-MMC-AR-DW-28113	Depot Store -Enlarged Section 1-1

*The applicable drawings will be shared to the bidder.*

*Note : The reference documents / drawings included under this section are for general information only and any interpretation of the results shall be construed as opinions only and not as representations as to the actual site conditions. The accuracy or reliability of the documents / drawings included under this section and of any other information supplied, prepared at any time by the Employer or others in connection with the Contract is not warranted.*



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## 8. Training

- i. The Sub-Contractor has to prepare a comprehensive training plan for the DM&P equipment / machine and submit to BEML / CMRL for notice of no objection.
- ii. The Sub-Contractor shall provide training that enables operators and maintainers to work with the machine in the most efficient and safe manner.
- iii. The Sub-Contractor shall provide comprehensive training and documentation to the BEML / CMRL's staff including Machine Operators & Machine Maintainers.
- iv. The Sub-Contractor shall adapt the content of its standard training courses to the CMRL' infrastructure and also to the trainees' skills background.
- v. The Sub-Contractor shall:
  - a) provide classroom training to trainees at the CMRL's depot premises.
  - b) provide competent training instructors, training manuals, all necessary aids and materials as required for training.
  - c) provide handouts for each trainee during the training.
- vi. The Sub-Contractor shall provide training for at least 6 BEML / CMRL nominated staff for the machine at Madhavaram depot. Period of training should be adequate (but not less than **7 working days** and shall cover all aspects to make nominated staff of BEML / CMRL to carry out operation, schedule attention, troubleshooting and repairs to this DM&P equipment / machine as and when required. A competency certificate shall be issued to each trainee after completion of training on the DM&P equipment / machine. Training should be imparted in English. Cost of training should be included in the cost of equipment.

## 9. Maintenance, Spares and Consumables during DLP

Throughout the DLP / DNP period, the Sub-Contractor shall be responsible for all the maintenance activities & always maintain sufficient stock of all Spares and Consumables at Madhavaram depot to the full extent necessary to carry out all scope of activities but not limited to the following:

- a) Corrective Maintenance
- b) Preventive Maintenance
- c) Asset and Maintenance Management System (AMMS)
- d) Spares management
- e) Operation of Depot Machinery & Plant Equipment.
- f) Coordination with OCC/ BCC/ DCC/ PPIO

Recommended spares:

Tenderer shall quote separately for list of recommended spares with price for equipment supplied after completion of 3 years DLP. The price offered shall remain valid for a period of 2 years beyond DLP. BEML at its sole discretion reserve the right to purchase recommended spares or not. (This shall not be included in the financial offer).

### TOOLS:

The Special Tools & Jigs, Software (if applicable) required and as recommended by the OEM shall be provided by Supplier.

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i). The Contractor shall provide one (1) individual Industrial Grade Laptop (windows OS) with each machine quantity (ATWP, **UFWL**, SPJ, WPMS, BORRS, BWP, BTU, VSS and CMV) for software loading / failure logs downloading etc :

Such laptops, shall comply with (but not be limited to) the following minimum specification:-

- a) Core i7 processor
- b) RAM 32GB
- c) SSD Storage Unit 1TB and above
- d) Screen 14 Inch
- e) Enhanced Battery Life

The Contractor shall submit details of the laptop specification / configuration to CMRL for approval during design stage.

ii). 3 sets of keys for each applicable machine.

iii) Any other tools such as special keys, measuring and monitoring tools etc which are required for rectifying the machine failures, shall be supplied for each machine. Contractor shall furnish details of such above special tools.

## 10. Commitment beyond DLP Period:

The Sub-contractor shall commit to support BEML / end customer CMRL for requirement of any additional Equipment, Spares, Service required for 15 years beyond DLP period of 3 years.

Spares support and Technical Guidance should be provided to carry out the below mentioned activity (but shall not limited) beyond DLP for 15 years,

- ☐ Preventive / periodic / Schedule Maintenance,
- ☐ Unscheduled Maintenance, Corrective Maintenance
- ☐ Providing Emergency support during Operational failures.
- ☐ Software upgradation
- ☐ Documentation upgradation
- ☐ Remote diagnosis (where applicable)
- ☐ And other as applicable

## 11. Availability During DLP Period

### 11.1 DM&P Availability Target

Penalties for not achieving availability target will be as per ERTS **PART- 2: Section VI C** of the respective equipment.

### 11.2 Penalty Clause:

If the Works or sections are not available for usage by the Employer for more than 48 hrs, then a penalty shall be paid by the Contractor as set out below. The cumulative amount shall be deducted by the Employer from the subsequent bills submitted by Contractor.


Depot Machinery & Plant: Rs. 5,000 per day/ equipment.

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A penalty of Rs. 2 lakhs for each case shall be levied for the failure or malfunction in the Works or sections during passenger operation which interrupt metro operations in the specific corridor for more than 10 mins.

## **12. DNP / DLP / Warranty**

- 12.1. The Contractor shall warrant that all equipment and spares etc. supplied against the contract shall be free from defects and faults in design, materials, workmanship and manufacture and shall be of the highest grade and consistent with the established and generally accepted standards for goods of the type ordered and in full conformity with the contract specifications.
- 12.2. The warranty period shall be 36 months after the date of issue of successful commissioning and proving test certificate of the machine at site. Any approval of acceptance issued by BEML during the course of installation, commissioning & proving out test shall not in any way limit the Contractor's liability.
- 12.3. In case where replacement of parts takes place during the warranty period, for replaced item and concerned sub-assembly shall extend further 36 months from the date of replacement of the defective parts. This extended period shall be known as extended warranty period.
- 12.4. The Contractor's liability in respect of any defects shall be to supply, install & commission any defective part free of any charge or the repair the defective parts, so as to ensure minimum down time of the machine
- 12.5. In case of delay in replacement/repair of defective parts, BEML may get the replacement carried out through any other outside agency. In such a case the cost of repair, replacement shall be borne by the Contractor.
- 12.6. Failure of the Contractor to meet with the warrantee obligations shall result in unsatisfactory performance of the contractor and the consequence of the same shall be applicable at the risk and cost of the contractor.
- 12.7. The decision of BEML in regard to Contractor's liability and amount if any payable under this warranty shall be final and conclusive.

13.		CMRL ARE02A Procurement Technical Specification for UNDER FLOOR WHEEL LATHE (UFWL)	DOC. NO.	GR/TD/7721
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**13. List of Enclosures**

Enclosure No.	Document Description	No of Pages
1.	PART- 2: Section VI B Chapter-1 – GS & Scope_ERTS DM&P	12
2.	PART- 2: Section VI B Chapter-2, Clause 2.1– TS_ERTS DM&P	16
3.	PART- 2: Section VI B Chapter-4 –Interface Management_ERTS DM&P	11
4.	PART- 2: Section VI C: Comprehensive Maintenance Contract (CMC)_ERTS DM&P	68
5.	SYS Form - 10	1
6.	BIM Guidelines for Asset Information Model	55
7.	Applicable Depot Layout drawings (SI no 9,10 of CI 7.8)	2
8.	Vendor approval / Manufacturer Credentials form	1

**14. Submittals with Technical Offer**

**The sub-contractor shall submit all the document as per Annexure 1.**

	<b>TECHNICAL OFFER</b>  <b>SUBMITTALS CHECK SHEET</b>	Project CMRL ARE02A
		ANNEXURE-1
		Page 1 of 1
M&P Equipment	UNDER FLOOR WHEEL LATHE (UFWL)	PTS Doc No: GR/TD/7721

**Annexure-1**

SL. No.	Details	Submitted	Not Submitted	Ref Doc.
1.	Duly filled <b>Vendor approval / Manufacturer Credentials form</b> meeting the EQC along with SYS Form & Performance Certificates.	<input type="checkbox"/>	<input type="checkbox"/>	
2.	Complete <b>Technical offer</b> for Procurement Technical Specification for Under Floor Wheel Lathe (UFWL).	<input type="checkbox"/>	<input type="checkbox"/>	
3.	Clause-wise Compliance / comments against the <b>PTS</b> .	<input type="checkbox"/>	<input type="checkbox"/>	
4.	Clause-wise Compliance / comments to <b>Section VI B</b> (Chapter 1, 2 & 4) Technical Specifications ( <b>ERTS</b> ) – Depot Machinery & Plant (DM&P)	<input type="checkbox"/>	<input type="checkbox"/>	
5.	Clause-wise Compliance / comments to <b>Section VI C</b> Technical Specification ( <b>ERTS</b> ) – Comprehensive Maintenance Contract (CMC) of Depot Machinery & Plant. ( <b>Applicable for DLP Period</b> )	<input type="checkbox"/>	<input type="checkbox"/>	
6.	Clause-wise Compliance / comments to BIM Guidelines for Asset Information Model.	<input type="checkbox"/>	<input type="checkbox"/>	
7.	Company profile, ISO certificates, Organization chart, Quality Control Process.	<input type="checkbox"/>	<input type="checkbox"/>	

**It is to be noted that incomplete submission is liable for rejection.**

**Signature of the Bidder with seal**