

**BHARAT HEAVY ELECTRICALS LIMITED**  
**(A Government of India Undertaking)**  
**P.O. BHEL Jhansi 284120**

**LOCOMOTIVE MANUFACTURING DEPARTMENT**

**Notice Inviting Tender (NIT)**  
**For**

Works Contract of Assembly work (Electrical, Mechanical and Bogie) in  
28 nos WAG-9HC locomotives

Tender Enquiry No.

LMM/TW/22-23/007

**Contact Person :**

Name : MS Monika  
Designation : Manager (CMM)  
Email : monikav@bhel.in  
PH : 0510 – 2770001 – 2414

OR

Name: P B S Ekka  
Designation: AGM (CMM)  
Email: pbsekka@bhel.in  
PHONE: 0510-2770001-2549

Tender due date: 14/10/2022 13:15 hrs.

Tender Opening date: 14/10/2022 14:00 hrs

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We hereby accepted above (signature & seal of bidder)

Seal & Signature of BHEL contracting authority



## BHARAT HEAVY ELECTRICALS LIMITED

(A Govt. of India undertaking)

LOCOMOTIVE MANUFACTURING (LMM), JHANSI - 284120

TENDER ENQUIRY NO: LMM/TW/22-23/007

DATE: 21.09.22

### DETAILS OF TENDER DOCUMENT

L	M	M	T	W	2	2	2	3	0	0	7
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#### Electrical, Mechanical and Bogie assembly work of WAG-9HC loco at Loco assy shop, BHEL Jhansi

1. BHEL Jhansi is in the process of finalizing the Works Contract for “Electrical, Mechanical and Bogie assembly work of 28 nos. WAG-9HC locomotive at Loco assembly shop, BHEL Jhansi”

2. The tender document has been detailed as follows:

- Notice Inviting Tender (Annexure A)
- Work Specifications (Annexure B)
- Qualifying Requirements (Annexure C)
- Documents required (Annexure C1).
- General Terms & conditions
- Price Bid (Annexure JS 146)
- Blank Price bid Format JS 472 attached
- Forms & Formats (Annexure I, II, III & IV)
- Self-declaration (Annexure V)
- Contract Agreement (Annexure VI)
- Indemnity Bond (Annexure VII)
- Checklists of documents for enquiry (Annexure VIII)
- Performa of Bank guarantee (Annexure IX)
- Statement of paid leave of employee for month (Annexure – X)
- Declaration regarding elimination cartel formation (Annexure – XII)
- SOP for implementation of risk and cost option for non-performing (Annexure – XIII)

The duly filled in Technical and Price / Rate bids (Annexure C and JS -146, separately) along with General Terms and Conditions and all other attachments with the signature of the tenderer on all the pages and complete in all respects super scribed as “Quotation for Tender No LMM/TW/21-22/007 dated **21.09.2022**” should reach us in a sealed cover on or before **14/10/2022** (13.15 hours) through Registered / Speed post or the same may be dropped in the tender box available at the following address:

Tender Box  
CISF Control Room/Office  
Administrative Building  
Bharat Heavy Electricals Limited  
Jhansi-284 120

**Note:** (i) Incomplete offers are liable for rejection.

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*(ii) Technical bid and price bid should be submitted in separate sealed envelopes. In case the bids are found in one single envelope then the "bids" are liable to be rejected.*

**TENDER DOCUMENT FOR**

**WORKS CONTRACT FOR ELECTRICAL, MECHANICAL & Bogie Assembly  
WORKS OF WAG-9HC LOCOMOTIVE AT LMM SHOP, BHEL JHANSI**

**The tender document has been detailed as follows:**

SN	Description	Annexure No.	Page No.	No.of Pages
01.	Notice Inviting Tender	A	1-5	27
02.	Work Specification, Measurement of work and Payment	B	6-10	
03.	Qualifying Requirements	C	11	
04	Performa for submitting Technical Bid	D	13	
05	Appendix 1- Details of all activities		14-27	
06	Self-Declaration	E	28	1
06	General Terms & conditions of enquiry (JHS 2055C R02)	Copy Enclosed	29-42	14
07	Price Bid Sheet	F	43	1
08	Clubbed Annexures (I to X) Forms	I to X	44-58	15
09	Certificate by CA for MSME	XI	59	1
10	Declaration regarding elimination cartel formation	XII	60	1
11	SOP for implementation of risk and cost option for non-performing	XIII	61-70	10
	TOTAL			70

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<b>1</b>	<b>Scope of Work</b>	Works contract for Electrical, Mechanical and Bogie assembly work of 28 nos. WAG-9HC locomotive at Loco assy shop, BHEL Jhansi
<b>2</b>	<b>Tender evaluation criteria</b>	As per qualifying requirements (see annexure C attached)
<b>3</b>	<b>Validity of Contract</b>	Contract period shall be 18 months from the date of award of contract
<b>4</b>	<b>Date and Time of Receipt of Tenders</b>	Up to 13:15 hrs. on 14.10.22
<b>5</b>	<b>Date and Time of Opening of Technical bids</b>	14:00 hrs. on 14.10.22
<b>6</b>	<b>Address for submitting the Tender</b>	Tender Box, CISF Control Room/Office, Administrative Building, Bharat Heavy Electricals Limited, Jhansi-284120
<b>7</b>	<b>Earnest Money Deposit (EMD)</b>	<b>Rs. 1,36,610/-</b> (Rupees One Lakh Thirty Six Thousand Six hundred and Ten only)
<b>7(a)</b>	The EMD may be accepted only in the following forms: (i) Electronic Fund Transfer credited in BHEL account (before tender opening) <i>BHEL account details: Bank Name: - SBI; A/c No. :- 10670828866 ; IFSC code:- SBIN0003807, A/c Holder Name:- BHARAT HEAVY ELECTRICALS LIMITED</i> (ii) Card swapping through POS machine at Cash section of BHEL Jhansi.)	
<b>8(a)</b>	In case of successful bidder, EMD will be converted and adjusted against the security deposit.	
<b>8(b)</b>	<b>EMD will be forfeited in following cases</b>	
<b>(i)</b>	After opening the tender, the bidder revokes his tender within the validity period or increases his quoted rate.	
<b>(ii)</b>	The bidder does not commence the work within the stipulated period as per LOI/ Contract. In case the LOI/contract is silent in this regard, then within 15 days after award of contract.	

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(iii)	For MSME bidders submission of EMD and tender cost will be applicable as per MSME act.	
8(c)	EMD given by all unsuccessful tenderers shall be refunded normally within 15 days of acceptance of award of work by successful tenderer.	
8(d)	EMD shall not carry any interest.	
9	<b>Validity of Offer</b>	120 days from the date of opening of Technical Bid (Part-I)
10	<b>Security Deposit (SD)</b>	As per General terms & conditions
12	<b>Bonus Clause</b>	Bonus Clause as per the 'Schedule G of VIII of GTC 'JHS 2055C Rev 01' is not applicable in this tender. However, contractor has to ensure statutory compliances w.r.t labour.
13	<b>Reverse Auction</b>	BHEL Shall be resorting to reverse auction (RA) (Guidelines as available on <a href="http://www.bhel.com">www.bhel.com</a> ) for this tender. RA shall be conducted among the techno-commercially qualified bidders. Price bids of all techno-commercially qualified bidders shall be opened and same shall be considered for RA. In case any bidder(s) do(es) not participate in the reverse auction, their sealed envelope price bid along with applicable loading, if any, shall be considered for ranking
11	<b>GST</b>	18 % of quoted rate.
12	<b>PF &amp; ESI</b>	Contractor has to submit PF and ESI registration certificate after issue of LOI and before award of Work Order to him.
13	<b>Address for issue of Tender</b>	AGM(LMM, LMP), Bharat Heavy Electricals Limited Jhansi, PIN-284120

**Note:** (i) The contractors may physically visit the work place before quoting their rates.

For relevant details please visit our website "[www.bhel.com](http://www.bhel.com)" &

[www.eprocure.gov.in](http://www.eprocure.gov.in).

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### Annexure B

#### WORK SPECIFICATION

1. SCOPE OF WORK OF THE CONTRACTOR SHALL BE AS FOLLOWING:

For Detailed Scope of Work refer pages (13-27 ).

- a. The contractor shall be responsible for "Electrical, Mechanical and Bogie assembly work of WAG-9HC locomotive at Loco assy shop". If bidder desires sample/ typical drawing of assemblies, can be provided for reference only, however the contractor shall execute the job as per the specific drawing provided by the Loco Manufacturing Deptt., BHEL, Jhansi.
- b. The scope of work includes:
  - I. **Electrical work of WAG-9HC locomotives includes major works as follows:**
    1. Cable Tray and cable Laying
    2. Cable termination above u/f, below u/f and cabins
    3. Battery mounting and termination
    4. Roof preparation
    5. QC / RDSO / shed / loco testing stage clearance
  - II. **Mechanical work**
    1. Roof Equipment mounting work
    2. Below Underframe Equipment mounting
    3. Front and Drivers Cabin Work
    4. Machine Room Equipment mounting
    5. After lowering work
    6. All QC stage clearances
  - III. **Bogie Assembly Work**
  - IV. **Machining Work of Bogie items**
  - V. **Miscellaneous Work**
- c. The work shall conform to dimensions and tolerances given in various drawings and documents that will be provided during assembly. If any portion of works is found to be defective in workmanship and not conforming to drawings / documents, the contractor shall dismantle and re-do the work duly replacing the defective materials at their own cost, failing which recoveries, as determined by BHEL, shall be deducted from contractor's bills.
- d. Even after completion of job at LMM & handing over to testing department, vendors has to do the rectification required if any found by the user department before despatch. In case

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of refusal, the work will be carried out at their risk & cost as per BHEL guidelines. However, in major rework (not due to the fault of vendor) involving lifting of Loco shell, vendor shall be paid extra for rework involved bases on the measurement of actual work done. The calculation of work done as assessed by BHEL shall be final.

- e. The work covered under this specification is of highly sophisticated nature, requiring the best quality workmanship and supervision. The contractor should ensure proper planning and successful and timely completion of the work to meet the overall manufacturing schedule. The contractor must deploy adequate quantity of tools & plants, modern / latest fixtures etc. which are not available with BHEL to meet the plan target of LMM. He must also deploy adequate trained, qualified and experienced supervisory staff and skilled personnel.
- f. Contractor may be required to work in 3 –shifts. Contractor shall appoint qualified supervisors for A/B/C Shifts for coordination with various departments of BHEL, Jhansi. Contractor has to organize adequate work force of qualified and experienced welders and fitters to take up parallel working for Locomotive manufacturing shops.
- g. Machines/equipment such as welding machines, hand grinding machines and painting gun shall be arranged by contractor. Jigs & Fixtures, hand lamps required as directed by BHEL/Engineer for completion of job to be made available by contractor. In stages, machining operation, if needed as per drawing, shall be in BHEL's scope.
- h. Crimping /cutting tools, Plier and other special tools and Fixtures shall be provided by BHEL free of cost.
- i. Testing at various stages shall be done by BHEL-QC/Customer/RDSO and proper record shall be maintained by contractor. Inspection/clearance by BHEL-QC/Customer shall be the responsibility of the contractor. In addition, the Contractor shall attend to any rework/modifications, as and when suggested by BHEL-QC / BHEL Engg.
- j. Maintaining proper documentation of all the activities undertaken by the Contractor as per the proforma mutually agreed with BHEL, Submission of daily/monthly progress reports and any such document as and when desired by BHEL/owner.
- k. The Contractor shall be responsible for complying with all the applicable statutory acts & laws.
- l. BHEL, Jhansi is certified for ISO 9001-2015. Quality of work to customer's satisfaction and fulfilment of system requirements are the essence of ISO 9001 certification. BHEL, Jhansi has HSE certification (ISO 14001 & OHSAS 18001) and therefore Contractor also shall organize/

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plan/ perform all their activities to meet with the applicable requirements of these standards.

- m. Contractor shall give undertaking for providing skilled & Un-skilled work force as per requirement of BHEL during execution of contract.

### 2. MEASUREMENT OF WORK & PAYMENT:

- i. Work shall be measured per loco basis. Vendor will be eligible to raise bill for each loco on handing over respective loco to testing department. 80% payment of each loco shall be released on handing over of respective loco to testing department and balance 20% payment shall be released after dispatch of respective loco from factory premises.
- ii. Scope of work has been segregated in various modules which are mentioned below along with the completion time of respective module.

Module no.	Module name	Completion time (Days)
1	Machining of Bogie items	7
2	Cable tray fixing and cable laying	7
3	equipment mounting in machine room & B/U frame	5
4	Termination of eqpt. above u/frame (cabin and M/c room)	7
5	Driver Cabin eqpt. mounting & furnishing work (Cab-1&Cab-2)	7
6	Cable termination of eqpt. Below u/frame	5
7	Roof Preparation and equipment mounting on roof	4
8	Buffer and CBC drilling and mounting	2
9	Balance electrical activities	4
10	Assembly of Bogie Part 1	5
11	Assembly of Bogie Part 2	7
12	H/o to testing (Misc. Work)	

- iii. If any module is not allocated to contractor due to quality, delivery and exigency, payment of the same shall not be made to contractor as per below schedule. Execution department will issue working instruction including scope of work for each loco well in advance.

Module no.	Module name	% of per loco rate as per price bid
1	Machining	3.45%
2	Cable tray fixing and cable laying	4.06%
3	equipment mounting in machine room & B/U frame	17.89%

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4	Termination of eqpt. above u/frame (cabin and M/c room)	14.05%
5	Driver Cabin eqpt. mounting & furnishing work (Cab-1&Cab-2)	7.22%
6	Cable termination of eqpt. Below u/frame	3.38%
7	Roof Preparation and equipment mounting on roof	5.35%
8	Buffer and CBC drilling and mounting	1.90%
9	Balance electrical activities	8.05%
10	Assembly of Bogie Part 1	3.85%
11	Assembly of Bogie Part 2	15.27%
12	H/o to testing (Misc. Work)	15.53%

iv. All the payments will be subject to deduction of tax at source applicable as per law.

**3. Estimated Quantum of Works:** 28 nos. WAG-9HC Locomotives.

**Note:** The quantity indicated is a projection based on the present requirements. The quantity may increase / decrease based on BHEL's order book position and production requirements. Loading (letter order) will be given accordingly.

**4. Delivery Period:**

Contractor has to deliver the work allotted to him as per the completion time mentioned in table for each module. However, if any delay occurs on account of BHEL in providing material or other work front, that period shall be added in the completion period.

**5. LD Clause:** Any delay in execution of work will attract penalty. Contractor has to deploy adequate number of workers to execute the quantum of work. The quantum of work will be as per monthly production plan which shall be reviewed/monitored on weekly basis. Delay if attributable to firm; penalty shall be imposed @0.5% per week for delayed work (portion of work as per point no 2 (ii) 'Measurement of Work and Payment') and maximum up to the ceiling of 10 % of the contract value of each loco w.r.t. delayed work. If any defect is noticed in the work at later stage, the firm shall repair the same, in short time free of cost. Cost of rework / rejection will be recovered from the contractor, if the same is found to be occurred due to negligence/lack of skill of the worker. Executive in charge shall keep proper records for above purpose. The Penalty shall be recovered from the EMD, Security Deposit, Contract amount and running bills etc.

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6. All required input materials for assembly will be provided to contractors within 3 working days from the contractor's requisition date.
7. **Splitting of contract:** Due to large quantity requirement, we may finalize the tender quantities among more than one bidder (after acceptance of L1 price by the other bidders).

All the eligible bidders will be categorized from L1 to Lh bidder (Lh will be the bidder who quoted highest rate) On basis of their quoted rates. In case of equal rates at the same level, toss/lottery shall be drawn among all the contractors having quoted equal rates for grading from lower to higher rates. This list shall be referred for award of work.

The contract shall be splitted maximum between two contractors as illustrated below:

P	L1	L2	TOTAL
1	100	-	100
2	70	30	100

where P is the accepted no. of qualified responses.

The distribution shall be done on the acceptance given by the bidder(s) to the L1 price counter offered to them. In case none of the bidders accepts the counter offer (L2 to Lh), the entire work order will be awarded to lowest bidder.

### 8. **Drawing and Documents:**

(i) The detailed drawings, specifications available with BHEL engineers will be made available to the contractor during execution of work in shop. The contractor will also ensure availability of all drawings / documents at work place.

(ii) Any error or ambiguity be discovered in the specification or information the contractor shall forthwith bring the same to the notice of BHEL before commencement of work. BHEL's interpretation in such cases shall be final and binding on the contractor.

(iii) The data furnished in various annexure enclosed with this tender specification are only approximate and for guidance. However, the change in the design and in the quantity may occur as is usual in any such large scale of work. The contractors quoted rates shall be inclusive of the above factors.

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Annexure – 'C'

SI No	Description of Qualifying Requirement
1.	<p><b>Average Annual financial turnover</b> during the last 3 years ending 31<sup>st</sup> March 2022, should be at least <b>Rs. 20.49 Lakh/-</b> approx.</p> <p>The following documents to be submitted</p> <ul style="list-style-type: none"> <li>i) A certificate from CA dully vetting the turnover. "OR"</li> <li>ii) Audited balance sheet &amp; Profit and loss statement.</li> </ul> <p><i>Note-If T/o details of 3 years are not available then available years T/o shall be evaluated by dividing it by 3.</i></p>
2.	<p><b>Work Experience: (Bidder</b> should fulfill any one of the following):</p> <p>Experience of having successfully completed <b>similar works*</b> (defined below) during last 7 years of month before the one in which applications are invited either of the following: -</p> <p>Three similar completed works each valuing not less than the amount equal to <b>Rs 27.32 Lakh.</b></p> <p><b>OR</b></p> <p>Two similar completed works each valuing not less than the amount equal to <b>Rs 34.15 Lakh.</b></p> <p><b>OR</b></p> <p>One similar completed works each valuing not less than the amount equal to <b>Rs 54.64 Lakh.</b></p> <p><b>*Similar Work</b> means any service or works contract of requisite value in any PSU/CPSU/State govt./ Central Govt./ Private sector involving manufacturing/maintenance or assistance in manufacturing/maintenance activities of electric equipment or Electric locomotives / Diesel Electric locomotive:</p> <ul style="list-style-type: none"> <li>i). Completion Certificate/ proof of completion</li> <li>ii). Work Order /Purchase Order</li> <li>iii). TDS Certificate (in addition to above, in case of experience in Private Sector).</li> </ul>
3.	Contractor Should have PAN number.
4.	Contractor Should have GST (PAN based)
5.	Bidders are required to submit a self-declaration on their letter head as per the Format enclosed in <b>Annexure E.</b>
6.	<p>The documents required for legal entities under whose name and style Contractor has participated in the tender are as follows:</p> <ul style="list-style-type: none"> <li>6.1) Partnership Firm: Partnership Deed registered at the office of Registrar of Firms.</li> <li>6.2) Company: Certified copy Memorandum of Association, Article of Association and Incorporation Certificate.</li> <li>6.3) Society: Registration certificate issued by Registrar of societies.</li> <li>6.4) Sole Proprietor-ship Firm: Profession Tax Regn./ Municipal Regn/ PAN of Firm (Proprietor) along with Self declaration on Letter head.</li> <li>6.5) Limited liability partnership agreement registered under company's act.</li> </ul>

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1	Name of the firm <b>(Essential)</b>	
2	Address and Contact Numbers <b>(Essential)</b>	
3	Name of the Proprietor <b>(Essential)</b>	
4	Registration Number of the Firm <b>(Essential)</b>	
	Copy of the Certificate	Enclosed / Not Enclosed
5	PAN/TAN Number <b>(Essential)</b>	
6	GST Number(PAN Based) <b>(Essential)</b>	
7	Experience Certificate (Along with balance sheet & profit and loss account/ turnover certificate issued by CA) <b>(Essential)</b>	Enclosed / Not Enclosed
8	Earnest Money Deposit <b>(Essential)</b>	Rs. 1,36,610/-
	Receipt No. & Date	
	Electronic fund Transfer no. (Bank)	
9	Validity of offer	120 days from the date opening of technical bid
10	Blank Price bid 'JS-472' <b>(Essential)</b>	Enclosed / Not Enclosed
11	Valid E-Mail Id <b>(Essential)</b>	
12	Participation in RA	YES / NO
13	Proprietorship/ partnership deed	
14	Acceptance of General Terms & Conditions	YES / NO
15	Submission of Security Deposit after issue of LOI and before award of Work Order to contractor.	YES / NO

**We agree to all the Terms & Conditions mentioned in the enquiry without any deviation.**-----  
We hereby accepted above (signature & seal of bidder)

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<b>Module 1</b>		<b>MACHINING OF BOGIE PARTS</b>		
<b>Sr No.</b>	<b>Drawing no</b>	<b>Description</b>	<b>QTY/ LOCO</b>	<b>Machining Hrs</b>
1	1209-01.412-186	MOTOR SUPPORT	8	64
2	1209-01.412-187	SUPPORT NEW (PIVOT)	4	24
3	1209-01.412-050	FIXING FOR DAMPER	16	32
4	1209-01.412-056	SUPPORT FOR DAMPER	8	32
5	1209-01.212-173	YAW DAMPER BKT. ASLY.	4	8
6	1209-01-412-188-1	BRACKET ASSLY. CYL END	4	4
7	1209-01-412-188-2	BRACKET ASSLY. CYL END	4	4
8	1209-01-312-195-1	BRACKET ASSY LH	2	4
9	1209-01-312-195-2	BRACKET ASSY RH	2	4
10	1209-01-312-196-1	BRACKET ASSLY. CYL END	4	16
11	1209-01-312-196-2	BRACKET ASSLY. CYL END	4	16
12	1209-01-312-199	BRACKET ASSY	4	8
13	1209-01-312-41	FORK HEAD LH & RH	4	16
14	1209-01-312-184 & 1209-01-312-252	BRACKET ASSY CYL END	8	8

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Module 2	CABLE TRAY FIXING AND CABLE LAYING
Sl.	Description
	<b>CABLE TRAY FIXING</b>
1	Cable tray fitting on Cab-1
2	Cable tray fitting on Cab-2
3	Cable tray fitting on Machine room
4	Cable tray fitting on both side wall
5	Cable tray fitting on panel base & side wall
	<b>CABLE LAYING AND CLAMPING</b>
6	150 mm sq cable laying & clamping
7	120 mm sq cable laying & clamping
8	70 mm sq & 95mm sq cable laying & clamping
9	All aux cable laying & clamping above u/f
10	All aux cable laying & clamping below u/f
11	All sensor cable laying & clamping
12	All control cable laying & clamping
13	All opt fibre cable laying & termi (both end)

Module 3	EQUIPMENT MOUNTING IN MACHINE ROOM & B/U FRAME
Sl no.	Description
	<b>EQUIPMENT MOUNTING IN MACHINE</b>
1	BALLAST FRAME BRICKS FILLING
2	BALLAST TOP PLATE FIT UP
3	BALLAST TOP PLATE WELDING
4	BALLAST FRAME MTG WITH LOCK BOLT & PLATE
5	BALLAST FRAME LOCKING BOLT & PLATE
6	CO2 FIRE CYLINDER MTG ON FRAME END-1
7	CO2 FIRE CYLINDER MTG IN LOCKER ROOM
8	HB-1 MTG WITH SIDE WALL SUPPORT
9	HB-2 MTG WITH SIDE WALL SUPPORT
10	HB-1 PANEL CABLE HOLDER FRAME MOUNTING
11	HB-2 PANEL CABLE HOLDER FRAME MOUNTING
12	HB-1 PANEL PARTITION PLATE MOUNTING
13	HB-2 PANEL PARTITION PLATE MOUNTING
14	SB-1 MTG. WITH SIDE WALL SUPPRT & SEALING RUBBR
15	SB-2 MTG. WITH SIDE WALL SUPPRT & SEALING RUBBR
16	AUX1 MTG WITH SIDE WALL SUPPRT & SEALING RUBBR

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**BHARAT HEAVY ELECTRICALS LIMITED****(A Govt. of India undertaking)****LOCOMOTIVE MANUFACTURING (LMM), JHANSI - 284120****TENDER ENQUIRY NO: LMM/TW/22-23/007****DATE: 21.09.22**

17	AUX2 MTG WITH SIDE WALL SUPPRT & SEALING RUBBR
18	MAIN CONVERTER-1 MTG COMP. WITH SUPP + GASKET
19	MAIN CONVERTER-2 MTG COMP. WITH SUPP + GASKET
20	CHT CABLE HOLDING BRACKET MOUNTING
21	M/C ROOM DUCT BRANCHES BLIND FLAGE MTG
22	E70 BREAK PANEL MTG WITH SUPPORT+O-RING
23	AUX COMPRESSOR MOUNTING-1 NO
24	FB PANEL MOUNTING WITH SIDE WALL SUPPRT
25	MR BLOWER PRE ASSY WITH DUCT M/C ROOM-1
26	MR BLOWER PRE ASSY WITH DUCT M/C ROOM-2
27	MR BLOWR FILTER PRE ASSY-1
28	MR BLOWR FILTER PRE ASSY-2
29	MR BLOWER FILTER FINAL MTG ON SIDE WALL-1
30	MR BLOWER FILTER FINAL MTG ON SIDE WALL-2
31	MR BLOWER FINAL INSTALLATION IN M/C ROOM-1
32	MR BLOWER FINAL INSTALLATION IN M/C ROOM-2
33	MR BLOWER HOSE CONN & SEALING ARRAGMENT1
34	MR BLOWER HOSE CONN & SEALING ARRAGMENT2
35	TM BLOWER FILTER PRE ASSY -1
36	TM BLOWER FILTER PRE ASSY -2
37	TM BLOWER FILTER FINAL MTG ON SIDE WALL-1
38	TM BLOWER FILTER FINAL MTG ON SIDE WALL-2
39	TM BLOWER FILTER SEAL PT WITH GASKET ASSY-1
40	TM BLOWER FILTERSEAL PT WITH GASKET ASSY-2
41	TM BLOWER FINAL INSTALLATION M/C ROOM-1
42	TM BLOWER FINAL INSTALLATION M/C ROOM-2
43	TM BLOWER HOSE CONN & SEALING ARRANGEMENT-1
44	TM BLOWER HOSE CONN & SEALING ARRANGEMENT-2
45	MR BLOWER SCAVENGER FAN PREASSY OF DUCT-1
46	MR BLOWER SCAVENGER FAN PREASSY OF DUCT-2
47	MR BLOWER SCAVENGER FINAL MTG IN M/C ROOM-1
48	MR BLOWER SCAVENGER FINAL MTG IN M/C ROOM-2
49	TM BLOWER SCAVENGER FAN PRE-ASSY. OF DUCT-1
50	TM BLOWER SCAVENGER FAN PRE-ASSY. OF DUCT-1
51	TM BLOWER SCAVENGER FINAL MTG M/C ROOM-1
52	TM BLOWER SCAVENGER FINAL MTG M/C ROOM-2
53	OCB & RADIATOR PRE-ASSY. + GASKT IN M/C ROOM-1
54	OCB & RADIATOR WITH GASKET IN M/C ROOM-2

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55	OCB + RADIATOR ASSY MTG IN M/C ROOM-1
56	OCB + RADIATOR ASSY MTG IN M/C ROOM-2
57	RADIATOR METALIC HOSE CONNECTION MAIN CONVER-1
58	RADIATOR METALIC HOSE CONNECTION MAIN CONVER-2
59	CONSERVATOR WITH STAY MTG IN M/C ROOM-1
60	CONSERVATOR WITH STAY MTG IN M/C ROOM-2
61	CON. TO CON+TRFR HOSE CONNE. M/C ROOM-1
62	CON. TO CON+TRFR HOSE CONNE. M/C ROOM-2
63	CHEQUERE PLATE PRE MATCH M/C ROOM GALLERY
64	CHEQUERE PLATE FINAL MATCH M/CROOM GALLERY
	<b>EQUIPMENT MOUNTING BELOW UNDERFRAME</b>
65	TRANSFORMER MOUNTING WITH LOCKING
66	COMPRESSOR MOUNTING-1
67	COMPRESSOR MOUNTING-2
68	SLING MOUNTING IN COMPRESSORS-1
69	SLING MOUNTING IN COMPRESSORS-2
70	BATTERY BOX MOUNTING-1
71	BATTERY BOX MOUNTING-2
72	TRFR OIL PUMP MTG WITH BRACKET END-1
73	TRFR OIL PUMP MTG WITH BRACKET END-2
74	TRFR OIL PIPING OCB WITH O-RINGS END-1
75	TRFR OIL PIPING OCB WITH O-RINGS END-2
76	TRFR OIL PIPING DRAIN VALVE + SAFE GUARD END-1
77	TRFR OIL PIPING DRAIN VALVE + SAFE GUARD END-2
78	HOSE CON. BATTERY BOX -MR BLOWER DUCT END-1
79	HOSE CON. BATTERY BOX -MR BLOWER DUCT END-2
80	TM BELLOWS MOUNTING ALL
81	AIR DRYER MOUNTING
82	CATTLE GUARD MATCHING & PREPARATION END-1
83	CATTLE GUARD MATCHING & PREPARATION END-2
84	CATTLE GUARD MOUNTING END-1
85	CATTLE GUARD MOUNTING END-2
86	FRP MOUNTING WITH SUPPORTS END-1
87	FRP MOUNTING WITH SUPPORTS END-2
88	FOOT STEP ASSY & PLATEFORM ASSY MTG END-1
89	FOOT STEP ASSY & PLATEFORM ASSY MTG END-2
90	HAND RAIL ASSY END-1
91	HAND RAIL ASSY END-2

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92	CBC OPERATION ROD MTG END-1
93	CBC OPERATION ROD MTG END-2
94	WIND SCREEN MTG END-1
95	CBC OPERATION ROD MTG END-2
96	PROTECTION GRILL MTG END-1
97	PROTECTION GRILL MTG END-2
98	TRFR MTG BOLTS TORQUE TIGHTENING
99	UNDER SLUNG EQUIPMENT TORQUE TESTING END-1
100	UNDER SLUNG EQUIPMENT TORQUE TESTING END-2
101	RAIL GUARD ADJUSTMENT END-1
102	RAIL GUARD ADJUSTMENT END-2
103	OIL CIRCULATION OF TRANSFORMER PIPING

<b>Module 4</b>	<b>TERMINATION OF EQPT. ABOVE U/FRADE (CABIN AND M/C ROOM</b>
<b>Sl.</b>	<b>Description</b>
	<b>CAB 1 &amp; 2 WIRING AND TERMINATION</b>
1	Cabin Wiring Cab-1
2	Cabin Wiring Cab-2
3	Heater prep mtg wiring and connection
4	Heater prep mtg wiring and connection
5	Heater Rotary switch mtg. wiring conn. Cab 1
6	Heater Rotary switch mtg. wiring conn. Cab 2
7	AC Display unit mtg. wiring termination Cab 1
8	AC Display unit mtg. wiring termination Cab 2
9	AC Main Cont. unit mtg wiring termination Cab 1
10	AC Main Cont. unit mtg wiring termination Cab 2
11	AC wiring termination cab 1
12	AC wiring termination cab 2
13	Flasher light 1 mounting
14	Flasher light 2 mounting
15	Flasher light 1 wiring and termination
16	Flasher light 2 wiring and termination
17	FLCU 1 mounting wiring and termination
18	FLCU 2 mounting wiring and termination
19	All pedal switch prep. Mtg. and termination Cab 1
20	All pedal switch prep. Mtg. and termination Cab 2
21	Earthing work Cab-1 & Cab-2
22	Both marker light mtg. on cab-1

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23	Marker lights wiring and termination Cab-1
24	Both marker light mtg. on cab-2
25	Marker lights wiring and termination Cab-2
26	Head light mtg. on Cab-1
27	Head light wiring and termination Cab-1
28	Head light mtg. on Cab-2
29	Head light wiring and termination Cab-2
30	Both spot light mtg. & termination Cab-1
31	Both spot light mtg. & termination Cab-2
32	Both cab light mtg. termination Cab- 1
33	Both cab light mtg. termination Cab- 2
34	Both Fab mtg. and wiring termination on Cab-1`
35	Both Fab mtg. and wiring termination on Cab-1`
36	Speedometer 1 mtg. and connection
37	Speedometer 1 coupler prep.
38	Speedometer 2 mtg. and connection
39	Speedometer 2 coupler prep.
40	Master controler -1 mounting and termination
41	Master controler -2 mounting and termination
42	Decoupler prep. In cab-1
43	Decoupler prep. In cab-2
44	A-1 panel mounting on Loco and termination
45	A-2 panel mounting on Loco and termination
46	C-1 Panel mounting on Loco and termination
47	C-2 Panel mounting on Loco and termination
48	D-1 Panel mounting on Loco and termination
49	D-2 Panel mounting on Loco and termination
50	B-1 Panel wiring and termination
51	B-2 Panel wiring and termination
	<b>MACHINE ROOM TERMINATION ON EQUIPMENTS</b>
52	Oil cooling motor-1wiring and termination
53	Oil cooling motor-2wiring and termination
54	Main conv. 1 oil pump wiring termination
55	Main conv. 2 oil pump wiring termination
56	F-1 panel mtg. wiring and termination
57	F-2 panel mtg. wiring and termination
58	M/C room Blower -1 wiring and termination
59	M/C room Blower -2 wiring and termination

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60	Scavanging blower -1 for MR-1 blower wiring and termination
61	Scavanging blower -2 for MR-2 blower wiring and termination
62	Cap.-scave. Blow-1 for MR-1 blow wiri&termi
63	Cap.-scave. Blow-2 for MR-2 blow wiri&termi
64	TM Blower -1 wiring and termination
65	TM Blower -2 wiring and termination
66	Scavanging blower -1 for TM blower 1 wiring and termination
67	Scavanging blower -2 for TM blower 2 wiring and termination
68	CHT mtg.
69	CHT resistance mtg.
70	CHT and CT resistance wiring & termination
71	High voltage transformer resistance mounting
72	High voltage transformer resistance wiring & termination
73	Air dryer wiring & termination
74	Trasformer Power cable termination
75	FB panel power cables termination
76	FB Panel power D-coupler pre. And mtg.
77	SB-1 panel all D-coupler mtg.
78	SB-1 all ZiMOTA type coupler bunching and fitting
79	HB-1 panel power cables termination
80	HB-1 panel loom cables bunch + coupler fit
81	HB-2 panel power cables termination
82	HB-2 panel loom cables bunch + coupler fit
83	Aux conv. -1 power cable termi & coupler fit
84	Aux conv. -1 coupler prep. Fitting
85	Aux conv. -2 power cable termi & coupler fit
86	Main conv.-1 Panel power cable termination
87	Main conv.-2 Panel power cable termination
88	Main conv.-1 Panel D-coup +ZIMOTA coup. Prep.
89	Main conv.-1 Panel D coup + ZIMOTA coup mounting
90	Main conv.-2 Panel power cable termination
91	Main conv.-2 Panel to TFP jumper conn.
92	Main conv.-2 Panel D-coup +ZIMOTA coup. Prep.
93	Main conv.-2 Panel D coup + ZIMOTA coup mounting
94	Baby compressor wiring & termination
95	Tri plate Pn console wiring & termi
96	Pressure switch wiring and termi
97	L shape rubber fit in all TM cable passings

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TENDER ENQUIRY NO: LMM/TW/22-23/007

DATE: 21.09.22

98	Earthing choke mounting
99	Earthing choke wiring and termination
100	Harmonic filter jn. Box mtg,
101	Harmonic filter jn. Box wiring & termi
102	Harmonic filter jn. Box wiring & termi below

Module 5	DRIVER CABIN EQPT. MOUNTING & FURNISHING WORK (CAB-1&CAB-2)
Sl no.	Description
1	DRIVER SEAT PEDE. HOLE DRILL & TAP CAB-1
2	DRIVER SEAT PEDE. HOLE DRILL & TAP CAB-2
3	PLYWOOD PRE MATCHING CAB-1
4	PLYWOOD PRE MATCHING CAB-2
5	PLYWOOD INSTALLATION & MOUNTING CAB-1
6	PLYWOOD INSTALLATION & MOUNTING CAB-2
7	LINOLEUM SHEET PASTING & LAYING CAB-1
8	LINOLEUM SHEET PASTING & LAYING CAB-2
9	GLASS WOOL INSULATION PACKING IN CAB-1
10	GLASS WOOL INSULATION PACKING IN CAB-2
11	AL PERFORATED SHEET MATCHING CAB-1
12	AL PERFORATED SHEET MATCHING CAB-2
13	AL PERFORATED SHEET MTG & RIVETTING CAB-1
14	AL PERFORATED SHEET MTG & RIVETTING CAB-2
15	CABLE COVER ASSY CAB-1
16	CABLE COVER ASSY CAB-2
17	CO2 CYLINDER 2KG MTG WITH BRACKET CAB-1
18	CO2 CYLINDER 2KG MTG WITH BRACKET CAB-2
19	DRIVER SHEET MOUNTING CAB-1
20	DRIVER SHEET MOUNTING CAB-2
21	TREAD PLATE MOUNTING NEAR DOORS CAB-1
22	TREAD PLATE MOUNTING NEAR DOORS CAB-2
23	MR DOOR ACCESS PLATE FIXING CAB-1
24	MR DOOR ACCESS PLATE FIXING CAB-2
25	BLIND FRAME MOUNTING (SIDE GLASS) CAB-1
26	BLIND FRAME MOUNTING (SIDE GLASS) CAB-2
27	BLIND FRAME MOUNTING (FRONT GLASS) CAB-1
28	BLIND FRAME MOUNTING(FRONT GLASS) CAB-2
29	BLIND INSTALLATION(SIDE GLASS)CAB-1
30	BLIND INSTALLATION(SIDE GLASS)CAB-2

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31	BLIND INSTALLATION(FRONT GLASS)CAB-1
32	BLIND INSTALLATION(FRONT GLASS)CAB-2
33	PELMET INSTALLATION(FRONT GLASS) CAB-1
34	PELMET INSTALLATION(FRONT GLASS) CAB-2
35	DOOR LOCK MOUNTING SIDE DOORS CAB-1
36	DOOR LOCK MOUNTING SIDE DOORS CAB-2
37	INTERLOCK ASSY COVER FIXING CAB-1
38	INTERLOCK ASSY COVER FIXING CAB-2
39	DOOR LOCK MTG MACHINE ROOM DOORS CAB-1
40	DOOR LOCK MTG MACHINE ROOM DOORS CAB-2
42	DOOR STOPER & STRIKING PLATE MTG SIDE DOOR CAB-2
43	DOOR STOPER & STRIKING PLATE MTG M/R DOOR CAB-1
44	DOOR STOPER & STRIKING PLATE MTG M/R DOOR CAB-2
45	AC BOTTOM PLATE FIBER MOUNTING CAB-1
46	AC BOTTOM PLATE FIBER MOUNTING CAB-2

Module 6	CABLE TERMINATION OF EQPT. BELOW U/F FRAME (INCL. BATTERY MOUNTING & TERMINATION)
Sl.	Description
	<b>CABLE TERMINATION OF EQPT. BELOW U/F FRAME</b>
1	All TM earthing cables prep.
2	All TM earthing cables connections
3	All below u/f earthing prep.
4	All below u/f earthing connection
5	All above u/f earthing prep.
6	All above u/f earthing connections
7	All TM disconnecting box prep. Mtg.
8	All TM lug crimping and connection -in side motor
9	All TM bellow mtg. frame fitting
10	All TM cable connection and cable clamping
11	Main compressor-1 wiring and termination
12	Main compressor-2 wiring and termination
13	TFP oil pump-1 wiring and termination
14	TFP oil pump-2 wiring and termination
	<b>BATTERY PREPARATION, MOUNTING &amp; TERMINATION</b>
15	Battery Box 1&2 Insulator mtgscrew replace
16	Battery recharging
17	Battery placement on battery box1&2

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18	Battery wiring and termination on Battery box 1&2
19	Battery MCB mouting wiring and termination

<b>Module 7</b>	<b>ROOF PREPARATION AND EQUIPMENT MOUNTING ON ROOF</b>
<b>Sl no.</b>	<b>Description</b>
1	TRIAL LOWERING OF LOCO
2	FINAL LOWERING OF LOCO
3	DISMANTLING OF ROOF & PLACEMENT OVERSTAND
4	INSULATOR MTG ON ROOF
5	PANTOGRAPH MOUNTING END-1
6	PANTOGRAPH MOUNTING END-2
7	SERVO MOYOR MTG END-1
8	SERVO MOYOR MTG END-2
9	VCB MOUNTING
10	HOM MOUNTING
11	PRIMERY VOLTAGE TRFR MTG
12	SURGE ARRESTER 1,2
13	HT BUSHING MOUNTING
14	ROOF BUS BAR WITH PANTO DISCONNECT
15	HARMONIC FILTER MTG
16	PANTO CALIBRATION+LOCK DOWN FORCE END-1
17	PANTO CALIBRATION+LOCK DOWN FORCE END-2
18	OCB FILTER PRE ASSY,TRANSITION DUCT END-1
19	OCB FILTER PRE ASSY,TRANSITION DUCT END-2
20	FITUP MTG BUSH 40NO FOR OCB FILTER END-1
21	FITUP MTG BUSH 40NO FOR OCB FILTER END-2
22	WELDING MTG BUSH 40NOS OCB FILTER END-1
23	WELDING MTG BUSH 40NOS OCB FILTER END-2
24	FINAL MTG OF OCBFILTER WITH SEALING END-1
25	FINAL MTG OF OCBFILTER WITH SEALING END-2
26	SCAVENGING DUCT UNDER FOR OCBFILTER END-1
27	SCAVENGING DUCT UNDER FOR OCBFILTER END-2
28	HOSE CONN OCB FILTER + SCAVENGING DUCT END-1
29	HOSE CONN OCB FILTER + SCAVENGING DUCT END-2
30	AC MTG WITH RUBBER GASKETS END-1
31	AC MTG WITH RUBBER GASKETS END-2
32	ROOF MTG FINALLY OVER SUPER STRUCTURE

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33	LOCKING BRACKET OF ROOF
34	PANTOCALIBRATION QC + RDSO INSPECTION END-1
35	PANTOCALIBRATION QC + RDSO INSPECTION END-2

Module 8	BUFFER AND CBC DRILLING AND MOUNTING
Sl no.	Description
72138	SIDE BUFFER MOUNTING END-1
72139	SIDE BUFFER MOUNTING END-2
72140	SIDE BUFFER HEIGHT ADJ+SHIM INSERTION-1
72141	SIDE BUFFER HEIGHT ADJ+SHIM INSERTION-2
72142	CBC MOUNTING & LOCKING END-1
72143	CBC MOUNTING & LOCKING END-2
72144	DRAFT GEAR & STRIKER CASTING MTG END-1
72145	DRAFT GEAR & STRIKER CASTING MTG END-2
72146	CBC HEIGHT ADJUSTMENT END-1
72147	CBC HEIGHT ADJUSTMENT END-2

Module 9	BALANCE ELECTRICAL ACTIVITIES
Sl.	Description
	<b>ROOF PREPARATION</b>
1	All roof earthing cables prep.
2	All roof earthing cables connection
3	All roof HT connection jumpers prep.
4	All roof HT jumpers connection
	<b>EARTHING, NAME PLATE FIXING AND PROTECTION COVER FITTING</b>
5	UIC socket -1 mtg
6	UIC socket -2 mtg
7	Desk cover removal Cab-1
8	Desk cover removal Cab-2
9	Driver side desk cover fitting cab-1
10	Asst. driver side desk cover fitting cab-1
11	Driver side desk cover fitting cab-2
12	Main CHT mtg. on TFP and clamping
13	Main CHT mounting on roof and clamping
14	All tubelight mounting and termi on roof-1,2&3
15	Tube lights mounting and termi (roof 1,2&3)
16	Cori light switch socket mtg+termi - roofs
17	Roof-2 Cab prep. Wiring and VCB prep+fitting

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18	Roof-1 Cable and coupler (prep+wiring)
19	Roof-3 Cable and coupler (prep+wiring)
20	All earthing Jn. Box mtg.
21	Al earthing jn. Box cable prep & conn.
22	BHEL mono fitting on both end
23	All eqpt. N/plate fit and rivetting Cab-1
24	All eqpt. N/plate fit and rivetting Cab-2
25	All eqpt N/plate fit & rivet M/C room
26	All eqpt N/plate fit & rivet outside loco
27	Speedometer jn. Box mounting
28	Axle generator coupler mtg. & fixing
29	Aux. machine -1 pre-testing
30	Aux. machine -2 pre-testing
31	Asst. driver side desk cover fitting cab-2
32	All TM disconnecting box prep. Mtg.
33	All TM lug crimping and connection -in side motor
34	All TM bellow mtg. frame fitting
35	All TM cable connection and cable clamping
36	Speedometer jn. Box mounting, wiring & termi behind -2
37	All CIR&D coup final locking after tesing
38	CHT cover fitting
39	Harmonic filter Jn. Box cover fitting
40	TFP oil pressure & temp sensor mouting wiring and termi 1&2
41	DC/DC conv. Mounting termi on SB-1&2 panel
42	Temp sensor temperature on SB-1&2 panel
43	Train bus mounting and coupler fitting on SB-1 panel
44	Bio toilet wiring & termination
45	All TM sensor mtg.
46	All TM bellow mtg.

Module 10	Bogie Assembly Part-1	
1	PIVOT ASY BG-1	Complete bogie assembly before loco lowering
2	PIVOT ASY BG-1	Complete bogie assembly before loco lowering
3	GEAR PRESSING ON AXLE BG-1	Wheel axle set assembly
4	GEAR PRESSING ON AXLE BG-2	Wheel axle set assembly
5	SUSPENSION TUBE ASY COMPLETE BG-1	Wheel axle set assembly

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6	SUSPENSION TUBE ASY COMPLETE BG-2	Wheel axle set assembly
7	WHEEL PRESSING BG-1	Wheel axle set assembly
8	WHEEL PRESSING BG-2	Wheel axle set assembly
9	AXLE BOX BEARING MTG BG-1	Wheel axle set assembly
10	AXLE BOX BEARING MTG BG-2	Wheel axle set assembly
11	AXLE BOX MTG BG-1	Wheel axle set assembly
12	AXLE BOX MTG BG-2	Wheel axle set assembly
13	TM RUN TEST WITHOUT GEAR CASE BG-1	Wheel axle set assembly
14	TM RUN TEST WITHOUT GEAR CASE BG-2	Wheel axle set assembly
15	TM RUN TEST WITH GEAR CASE BG-1	Wheel axle set assembly
16	TM RUN TEST WITH GEAR CASE BG-2	Wheel axle set assembly
17	EARTH RETURN	Wheel axle set assembly

Module 11	BOGIE ASSEMBLY PART-2	
1	BUSH FITTING IN BOGIE FRAME-1	Complete bogie assembly before loco lowering
2	BUSH FITTING IN BOGIE FRAME-2	Complete bogie assembly before loco lowering
3	BREAK RIGGING ASSY BG-1	Complete bogie assembly before loco lowering
4	BREAK RIGGING ASSY BG-2	Complete bogie assembly before loco lowering
5	BREAK CYLINDER MTG. BG-1	Complete bogie assembly before loco lowering
6	BREAK CYLINDER MTG. BG-2	Complete bogie assembly before loco lowering
7	VERTICAL DAMPER MTG BG-1	Complete bogie assembly before loco lowering
8	VERTICAL DAMPER MTG. BG-2	Complete bogie assembly before loco lowering
9	HORIZONTAL DAMPER MTG. BG-1	Complete bogie assembly before loco lowering
10	HORIZONTAL DAMPER MTG. BG-2	Complete bogie assembly before loco lowering
11	YAW DAMPER MTG BG-1	Complete bogie assembly before loco lowering
12	YAW DAMPER MTG BG-2	Complete bogie assembly before loco lowering
13	SAND BOX MTG BG-1	Complete bogie assembly before loco lowering
14	SAND BOX MTG BG-2	Complete bogie assembly before loco lowering
15	SIDE AND TOP STOPPER MTG BG-1	Complete bogie assembly before loco lowering
16	SIDE AND TOP STOPPER MTG BG-2	Complete bogie assembly before loco lowering
17	BOGIE FINAL LOWRING BG-1	Complete bogie assembly before loco lowering
18	BOGIE FINAL LOWRING BG-2	Complete bogie assembly before loco lowering
19	AXLE DAMPER MTG. BG-1	Complete bogie assembly before loco lowering
20	AXLE DAMPER MTG. BG-2	Complete bogie assembly before loco lowering
21	TRACTION ARM MTG BG-1	Complete bogie assembly before loco lowering
22	TRACTION ARM MTG BG-2	Complete bogie assembly before loco lowering
23	AXLE GUIDE MTG WITH BOGIE BG-1	Complete bogie assembly before loco lowering
24	AXLE GUIDE MTG WITH BOGIE BG-2	Complete bogie assembly before loco lowering

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We hereby accepted above (signature & seal of bidder)

Seal & Signature of BHEL contracting authority



# BHARAT HEAVY ELECTRICALS LIMITED

(A Govt. of India undertaking)

LOCOMOTIVE MANUFACTURING (LMM), JHANSI - 284120

TENDER ENQUIRY NO: LMM/TW/22-23/007

DATE: 21.09.22

25	TIE BAR ASY BG-1	Complete bogie assembly before loco lowering
26	TIE BAR ASY BG-2	Complete bogie assembly before loco lowering
27	AXLE HOLDER MTG BG-1	Complete bogie assembly before loco lowering
28	AXLE HOLDER MTG BG-2	Complete bogie assembly before loco lowering
29	BREAK ROD MTG(PULL ROD) BG-1	Complete bogie assembly before loco lowering
30	BREAK ROD MTG(PULL ROD) BG-2	Complete bogie assembly before loco lowering
31	TRACTION MOTOR MTG BG-1	Wheel axle set assembly
32	TRACTION MOTOR MTG BG-2	Wheel axle set assembly
33	TM HOLDING PLATE MTG BG-1	Wheel axle set assembly
34	TM HOLDING PLATE MTG BG-2	Wheel axle set assembly
35	AXLE GUIDE MTG WITH AXLE BOX BG-1	Wheel axle set assembly
36	AXLE GUIDE MTG WITH AXLE BOX BG-2	Wheel axle set assembly
37	SPRING MTG BG-1	Complete bogie assembly before loco lowering
38	SPRING MTG BG-2	Complete bogie assembly before loco lowering
39	RUBBER BUSH FITTING ON AXLE GUIDE BG-1	Wheel axle set assembly
40	RUBBER BUSH FITTING ON AXLE GUIDE BG-2	Wheel axle set assembly
41	TRACTION ARM BUSH FITTING BG-1	Complete bogie assembly after loco lowering
42	TRACTION ARM BUSH FITTING BG-2	Complete bogie assembly before loco lowering
43	FOOT STEP ASSLY BG-1	Complete bogie assembly before loco lowering
44	FOOT STEP ASSLY BG-2	Complete bogie assembly before loco lowering
45	LOCKING(WELDING)BOGIE-1	Complete bogie assembly before loco lowering
46	LOCKING(WELDING)BOGIE-2	Complete bogie assembly before loco lowering
47	UNDERFRAME PIVOT ASSY CAB-1	Complete bogie assembly before loco lowering
48	UNDERFRAME PIVOT ASSY CAB-2	Complete bogie assembly before loco lowering
49	COMPLETE GEAR CASE MTG BG-1	Wheel axle set assembly
50	COMPLETE GEAR CASE MTG BG-2	Wheel axle set assembly
51	QC STAGE INSPECTION AFTER LOWERING	Complete bogie assembly after loco lowering
	<b>Misc. Work</b>	
52	Preparation work of wheel axle items like Wheel, Gear Wheel Pressing , Axle box assembly , Suspension Tube assembly, Gear case, TM motor , Gear wheel, Tm holding plates etc.	

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<b>Module 12</b>	<b>Misc. Activities</b>
1	Rain Test
2	S-Curve Test
3	Long Catenary
4	Material Handling: drawing of material from FMS store, SPC store, loading of material in shop, handing over activities of spares, Unpacking of Items, disposal of packing material
5	Cleaning of various material before assembly, removal of Anti Rust agent, Oil, Grease, Rusting etc.
6	Pre-testing of M/c Room Blower, MR Blower & Compressor
7	RDSO /Shed Booking: Mechanical & Electrical including internal connection of various panels.
8	Testing Booking
9	PDI/Pinking
10	Items/card/ modules replacement failed during testing
11	Loco Cleaning
12	Shunting
13	Crane-Slinger Operation
14	Coolant & Oil filling, Water filling
15	Grease filling & extraction for metal content test
16	Housekeeping of Assembly and Bogie Shop, arrangement of material in identified racks, 5S activities, cleaning painting of racks/stands/shop floor as directed by BHEL.

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