

NORTHERN RAILWAY BID DOCUMENT PART - II

Disclaimer

These specifications are tentative. They may require changes according to consignee's requirement. Consignees are therefore requested to modify these specifications accordingly before processes for procurement.

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Section-IV

IMPORTANT FEATURES OF THE TENDER

1 INSTRUCTIONS TO TENDERERS FOR FILLING TECHNICAL BID

- 1.1 Unless otherwise stated, latest alterations/ revisions of specifications/ standards/ drawings shall be applicable. In respect of safety standards and environmental standards relevant to the machine, the machine manufacturers shall ensure compliance with International (CE/ISO/DIN/JIS)/National standards (IS) (wherever applicable).
- 1.2 Tenderers should offer and quote for all the specified concomitant accessories, as these are considered essential for commissioning and utilization of the machine. Even if bidder does not recommend the purchase of any of these accessories, the price must be quoted for comparison purposes and their recommendation/suggestion to be indicated in the offer. Tenderers should also quote for optional accessories, spares and consumable spares as asked in the specifications.
- 1.3 In case, any item is required in sets, please specify nos. /pieces per set. This is essential for proper technical evaluation of the offer. Offers received without this may be considered as incomplete and liable to be rejected.
- 1.4 The bidder should quote only for the specified make of sub-assemblies and equipment wherever specified. Makes of sub-systems other than the specified ones will normally not be acceptable. In case, some other make is quoted, specific reasons for the same including its features/advantages over specified makes must be brought out in the offer.
- 1.5 In case there is a contradiction in any information provided (some parametric values given in the specification and those given in the brochure or some other document enclosed by the tenderer), unless specifically mentioned in the deviation cum confirmation statement under Annexure A of Section VI, the values as given in the specification shall be taken as confirmed by the tenderer and offer evaluated accordingly.
- 1.6 Bidder or his authorized agent, in their own interest, should visit the consignees listed in clause 3 Section-IV with prior appointment with Controlling Officer of the consignee and acquaint themselves with existing process of manufacturing/remanufacturing, site conditions, availability of material handling facilities etc.
- 1.7 The Purchaser may accept internationally accepted alternative specifications which ensure equal or higher quality than the specifications mentioned in the Technical

Specification. However, the decision of the Purchaser in this regard shall be final. A copy of the alternative specifications offered should be sent along with the offer. The Tenderer should also furnish "Statement of Deviations" from tender specifications (as per Annexure A, Section-VI) along with the offer.

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2. **Description: CNC VERTICAL TURNING LATHE**
Specification no. JUDW/CNC/VTL/WHL-1200/2024

2.1 **The machine shall have following configuration:**

2.1.1 CNC VERTICAL TURNING LATHE shall be capable of both rough and finish machining of solid wheels/tyres of various types as indicated in Annexure 'F' of Section VI.

2.1.2 The machine shall be supplied **Tooled up with all tools** capable of machining of solid wheels/ tyres of various types as listed in Annexure 'F' of Section VI.

2.1.3 The machine shall be supplied along with **CNC Part programs** for machining of solid wheels/ tyres of various types as listed in Annexure 'F' of Section VI.

2.1.4 The machine shall be capable of carrying out following machining operations (as applicable) on various types of wheels discs specified in Annexure 'F' of Section VI:

i. Flange facing, Hub facing, rough boring, finish boring, radius on top face.

ii. Hub facing and radius on bottom face.

iii. Grooving & chamfering.

iv. Grooving for indication of "limit diameter"

v. OD turning & Profile turning (for rough rolled cast wheels).

vi. Capable of Oil grooving

2.1.5 **Fixture Requirement –**

2.1.5.1 **Fixture for wheels –** Preferably common fixture to hold the wheels of each types from outside diameter for hub boring in the first set -up and another common fixture for operations listed in Annexure 'F' of Section VI for second set-up should be supplied.

2.1.5.2 Fixture should preferably be made from case hardened or nitrided material such as 20MnCr5/16MnCr5/ 90MnCrV8 (conforming to DIN standard or equivalent ISO standard) depending upon the requirement. Wherever required jig boring operation should be done to ensure the accuracy. The value of hardness of locating/resting surfaces should be in the range of 60 +/- 2 HRC.

2.1.5.3 The firm should guarantee the rigidity and accuracy of fixture throughout the working life of the machine. Design features and manufacturing details to achieve this objective should be clearly highlighted in offer.

2.1.5.4 The schematic fixture design should be indicated in the offer. The final layout with detailed drawings shall be submitted to the consignee along with GA drg. for approval within time period, as specified in time schedule.

2.1.6 **Operating Environment –** The machine is required to work in tropical Conditions i.e.

2.1.6.1 Maximum ambient temperature would be ranging from 0-50⁰ C.

2.1.6.2 Rate of temperature variation may be 2 to 4⁰ C per hour.

2.1.6.3 **Humidity –** Maximum humidity may reach up to 98% during monsoon season.

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2.2. Leading parameters (SCHEDULE-I):

2.2.1 Major parameters

(Note: No deviation is permitted in major parameters. The bidder should indicate the actual parameters offered.)

1	Table diameter	1200mm (minimum)
2	Turning diameter	1000mm (minimum)
3	Turning height above top of table	700mm (minimum)
4	Range of table speed (infinitely variable)	10 to 300 rpm
5	Range of feed (infinitely variable)	0.05 to 10mm/revolution
6	Horizontal traverse of Ram Head (X-axis)	150/800 mm (left/right from table center)
7	Vertical travel of Ram Head (Z- axis)	600 mm (minimum)
8	Rapid traverse of Ram Head	5000 mm/min. (minimum)
9	MACHINE PERFORMANCE AND ACCURACY	
9.1	Accuracy of X & Z axis as per VDI/DGQ 3441 or latest	0.012 mm over complete travel
9.2	Repeatability of X & Z axis as per VDI/DGQ 3441 or latest	0.007 mm
9.3	Minimum Surface finish requirement for wheels	
9.3.1	For turning	Ra 2.5 micron
9.3.2	For facing	Ra 1.6 micron
9.3.3	For boring	Ra 0.8 micron
9.4	Accuracies	
	a) Straightness of table surface b) Run out of table surface c) Run out of table side d) Parallelism of cross rail e) Straightness of up & down movement of rail head to table f) Perpendicularity of L & R movement of rail head to table g) Parallelism of table centre line to up/down movement of tool bar (L&R direction)	As per ISO 3655 Or DIN 8609

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2.2.2 Other Parameters

2.2.2.1 Power supply : 415 V +10% -20%, 50 Hz \pm 3%

2.2.2.2 Table loading capacity : 1500 Kg. (minimum)

2.3 Performance Standards-

Geometric and Performance Standards - The machine shall conform to following standards in addition to the accuracy desired in this specification.

2.3.1 The maximum noise should not exceed 85 dB when measured at a distance of 7 metres from the machine in the free field conditions as per IS: 4758-1968 and ISO test code 230 part-5.

2.3.2 The machine shall conform to ISO 3655 of 1986 or DIN 8609 or equivalent JIS Standard for Geometric and work piece accuracy test in addition to the accuracy desired in this specification and required for machining of wheels as listed in Annexure 'F' of Section VI.

2.4 Productivity:

The floor to floor cycle time for complete operations of loading / unloading, clamping /de-clamping, machine setting, hub boring (rough & finish), hub facing including radius cutting, Grooving for oil (LHB wheel discs) shall not exceed 27 minutes (average of machining 5 wheel discs) for a solid wheel, as listed in Annexure 'F' of Section VI. The floor to floor cycle time 27 minutes is considered assuming 5mm depth of cut for boring (rough plus finish cuts) and 3 mm depth of cut for facing.

The breakup of floor to floor time for machining of all components in Annexure-F is to be furnished by the bidder.

The basis of arriving at such timings i.e. speed, feed, number of rough and finish cuts, tools used, number of set ups, chucking and clamping pressure recommended, estimated timings of each element, depth of cut, number of passes, any other relevant data etc. should be furnished. **In case the above information is not enclosed by the bidder, his offer is liable to be rejected.**


Machining time should be such that the same could be maintained for regular 8 hours per shift, for double shift working, six days a week with machine availability of 85% without affecting reliability and accuracy of the machine over a period of 15 years.


2.5 Prove out at firm's premises:

2.5.1 In addition to the normal checks carried out during assembly and testing, as part of quality control measures of the firm, the firm is required to demonstrate the following at the time of inspection:

- The firm shall prove out floor to floor cycle time as claimed in the bid, on wheels of any one type (as per type of wheel discs listed in Annexure-F in Section VI). For this purpose, consignee shall provide minimum five nos. of wheels to the Firm against Bank Guarantee. The firm or his authorized representative would collect these wheels (on returnable basis) from the consignee.


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- b. Geometric and performance tests as per clause 2.3.
- c. **No-load endurance test** – The firm is required to do 48 hours' continuous running at machine manufacturer's premises and in case of any defect developing, the firm shall take necessary corrective action and repeat the test for another 48 hours, till trouble free operation is achieved. Firm should indicate the details of endurance test carried out at manufacturer's premises.
- d. **Maximum Horse Power or full load cutting test** – This shall be demonstrated for minimum 10 minutes for a depth of cut of minimum 8 mm. Details of proposed cutting parameters for the test, like depth of cut, speed and feed should be indicated in the bid.
- e. **Vibration test** – The manufacturer should furnish the proposed test scheme for carrying out this test at their works.
- f. **Noise measurement tests** as per clause 2.3.1 of Section IV.

2.6 Prove out at consignee's works:

2.6.1 After successful installation and commissioning of machine at consignee's site, the supplier or his authorized agent shall be required to prove out "floor-to-floor cycle time on Five nos. of each type of wheel discs/component listed in Annexure 'F' of section VI. For this purpose, Consignee shall make available the wheels for the purpose of prove out. In case of non-availability of wheels of a particular type, consignee can satisfy himself about the capability of machine, by carrying out proving operations on other type of wheels.

3. QUANTITY & CONSIGNEE

SI No	CONSIGNEE	Qty	Specification No.
1	SSE/WHL/JUDW/NR	2	JUDW/CNC/VTL/WHL-1200/2024

4. Scope of Supply:

4.1 The scope of supply shall include design, supply, and installation, testing, commissioning and proving of machine on turnkey basis. It includes all the concomitant accessories/ equipments as detailed in the specification and other concomitant accessories/ equipment, which the manufacturer considers essential to make the machine fully operational, when installed and commissioned. It shall also include installation and commissioning of related equipment, training of personnel in operation and maintenance of machine and supply of technical documentation.

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4.2 CONCOMITANT ACCESSORIES:

The machine should be accompanied with the following concomitant accessories:

4.2.1	Three-jaw hydraulically operated self-centering chuck with three sets of hard jaws and one set of soft jaws (ref. cl 1.2.7.4 of Section V). Note-One additional set of jaws required for processing FIAT wheels (For ICF only).	
4.2.2	Work holding fixture as per clause 2.1.5 of Section IV and 1.2.17.4 of Section V. a) Fixture(s) for holding all types of wheels for first set up b) Fixture(s) for holding all types of wheels for second set up	One set One set
4.2.3	ATC with 12 tool magazine (minimum)	One set
4.2.4	Tooling items a) Adopter, tool holders, boring bars and tools (Indexable type turning/facing/grooving tool/shank) required for various machining operations specified in Clause 2.1 of Section IV. b) Coated Inserts for each type of tool/shank c) Any other cutting tool essential for machining of wheel sets mentioned in Annexure "F" in Section VI. The details of toolings should be furnished in the bid.	Two sets 200 inserts each One set
4.2.5	First fill of grease, lubricating oil, coolant and hydraulic fluid (Quantity, Grade and Brand Name should be clearly indicated)	
4.2.6	Air conditioning system with eco-friendly type of refrigerant for control cabinet. The tenderer should furnish details i.e. make, cooling capacity, type of refrigerant used etc along with the bid (ref. cl. 1.2.15.2 of Section V).	One No.
4.2.7	Chip conveyor system to remove swarf/chip generated by the machine out- side the machine area (ref. cl. 1.2.16 of Section V).	One set
4.2.8	Refrigerant based cooling system for hydraulic system. The tenderer should furnish details i.e. make, cooling capacity, type of Refrigerant used etc along with the bid. Refrigerant used should be environment friendly. (ref. cl. 1.2.12.3 of Section V)	One set
4.2.9	Foundation and leveling bolts/grip expansion bolts. (Details to be furnished by the tenderer)	One set
4.2.10	Coolant system for cutting tools (ref. cl. 1.2.13 of Section V)	One set
4.2.11	A separate set of service tools for each according to the need, for Electrical, Millwright and Production departments in a portable tool box with locking facility and one steel cupboard of suitable size for storing machine manuals and records pertaining to the machine shall be supplied. List for Electrical department shall include electronic service kit such as multimeter, portable soldering iron of 15 watts of reputed make tweezers in addition to electrical toolkit. One Digital Inside Micrometer ranging 150- 200mm	One set of Service Tools for each department and only one steel cupboard of suitable size

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	(List to be submitted by the Bidder)	
4.2.12	1.5 Ton capacity Jib Crane with tackles for loading and unloading of wheel discs with following features/requirement i) Arm length of jib crane should be minimum 2430 mm. ii) Jib crane should be supplied with one spare set of lifting tackles (For ICF ONLY) .	One no.
4.2.13	Any other accessory essential for machining of wheels for operations indicated in Annexure "F" in Section VI should be quoted.	One set
4.2.14	Solid state voltage stabilizer with inbuilt /separate isolation Transformer of suitable capacity shall be provided. In case of separate Isolation transformer, Ultra isolation transformer suitable for the plant as per specifications given in clause 2.13.3 of section V.	1 no.
4.2.15	Portable Programmer to upload/download CNC/PLC Program, Data, part programs and for offline Diagnostic features. (Hardware and necessary software)	1 no.
4.2.16	Any other accessory/ equipment, which the manufacturer considers essential to make the machine fully operational, when installed and commissioned connected to power source and give the specified Output/productivity.	-

4.3 Optional Accessories:

Following optional accessories will be quoted by the tenderer. Cost of optional accessories shall be quoted separately and shall not be included in the basic price of the machine. Cost of optional accessories will not be taken for commercial evaluation of the firms.

4.3.1- Any other accessory which can improve the productivity, performance, reliability, - efficiency, or enhance the capability of the machine as a whole or part thereof, should be quoted as optional accessory.- **One Set**

5. EVALUATION CRITERIA

Total value of the offer will be calculated based on

- The cost of the basic machine.
- Cost of the concomitant accessories according to tender specifications.
- Cost of any other accessory which in the opinion of supplier is essentially required for making the machine fully functional.
- Cost of Turnkey Charges viz. foundation, installation & commissioning etc.
- Cost of Preventive Maintenance during 1st & 2nd year of Warranty Period.
- Cost of comprehensive AMC for five years after the warranty as per clause 17
- Duties and taxes as quoted by the bidder, insurance and freight.

6. OTHER ITEMS TO BE QUOTED:

The following items will need to be quoted additionally though will not be part of commercial evaluation:

- Optional Accessories with breakup of individual items as specified in clause 4.3 of section IV
- Spares for two years normal operation and maintenance as per clause 5 of section V
- Consumables as per clause 6 of section V with breakup of individual items as applicable.